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Prospects of Nigeria's ICT Infrastructure for E-Commerce and Cashless Economy

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Authors' contributions

This work was carried out in collaboration between the two authors. Both authors designed the study, wrote the protocol and the first draft of the manuscript. Both authors managed the literature searches, analyses of the study, read and approved the final manuscript.

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ABSTRACT

The contribution of Information and Communication Technology (ICT) to socio-economic growth and development is well-established. Global economies of the 21st century have come to realise that no country can become competitive in terms of trade, industry, manufacturing and service without adopting, deploying, integrating and utilising ICT in various sectors. This paper assessed the level of preparedness of Nigeria for e-commerce using the level of ICT adoption, usage and infrastructure available in the country. Data was sourced from International Telecommunication Unit (ITU) database with a reference period of 13 years (2000 to 2012). The result showed that Nigeria's investment and business prospects in ICT sector have improved over the years and particularly since the deregulation of the sector. The Internet and mobile cellular subscriptions are on the increase and show a great expansion potentials, which the private sector can exploit for further investment and growth of the ICT sector. The paper concluded that ICT policy needs to be fully implemented and public-private sectors collaboration or partnership should be strengthened to facilitate the e-commerce and cashless policy. Also, the spate of cybercrime and internet fraud within the sector must be adequately addressed to encourage young entrepreneurs.

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1. INTRODUCTION

Across the globe, there has been increased awareness of the usefulness of Information and Communication Technology (ICT) to enhancing growth and development. Global economies of the 21st century have come to realise that no country can become competitive in terms of trade, industry, manufacturing and services among others without adopting, deploying, integrating and utilising ICT in various sectors. The developed economies such as USA, UK, Germany and Japan were able to attain present level of development through the deployment of high technology, especially in the industrial sectors [1]. Even, some of the emerging economies like Brazil, China and other Asian Tigers achieved their present feats through the application of cutting-edge technology. In addition, developing economies have come to realise that any development efforts that is not hinged on technology is most likely to fail. The African economies, including Nigeria, have also recognized that local and global competitiveness depends on how they deploy technology to transform different sectors of their economies, especially the industrial sector. In view of this, most African countries are paying much emphasis on the ICT infrastructural development in their policies and programmes.

The technological revolution and rapid development in Information and Communications Technology (ICT) has brought about many new opportunities and challenges for the global industrial sector. ICT, especially the Internet, is now an accepted operational element of most global industries and many enterprises may no longer perform without it [2]. Most business transactions are now done online with little or no physical interaction. This type of online business dealings through the Internet are referred to as E-commerce. The emergence of e-commerce has significantly changed the business environment for both individuals and businesses around the world [3]. To this extent, most economic policies and investments are not without the development of ICT capacity and infrastructure that could facilitate e-commerce among local and international trade partners.

The current Nigeria's economic policy, championed by the Central Bank of Nigeria (CBN) is targeted at promoting a cashless system of transaction (e-commerce) in the

economy. The policy is aimed at ensuring compliance with global trend in business transactions, strengthen the economy, increase her openness, competitiveness and integrate her more closely into the global economy. In the recent time, there have been measures and policies, both economic and Information Technology, which had been put in place to drive e-commerce implementations in the country. It should be noted that the success of any e-commerce implementation in Nigeria depends largely on the ICT infrastructure availability, development, upgrading, deployment and utilisation. To many scholars, the current campaign by the Central Bank of Nigeria (CBN) for a cashless economy is viewed as a platform for economic development and increased global competitiveness. At the state levels, the pilot implementation of cashless policy started in some states in Nigeria (Lagos, Abia, Anambra, Ogun, Rivers, Kano states and the Federal Capital Territory (FCT), Abuja) with CBN's commitment to ensure total compliance across the country before 2020. This pilot phase indicates government readiness to implement the cashless economy across the states of the federation. However, while it appears that some states are set for the implementation of this policy, some are still not ready, given the minimum ICT infrastructure requirement for the implementation.

Also, it is noteworthy that the cashless system is a major pre-requisite for e-commerce implementation, but some of the states of the federation are basically cash-based, that is, with over 90% of funds in circulation [4]. Thus, most business transactions are largely consummated in cash due to reasons mainly attributed to lack of adequate ICT infrastructure and rural nature of the economy [4]. These and other factors identified in the literature [5,6,7,8] have influenced the implementation of e-commerce across the states in Nigeria.

However, Nigeria being considered as a fast-emerging world economic centre relative to business climate, a free and competitive marketing system, consumer and purchasing power parity, market reforms, oil and related resource-rich reserves and fiscal freedom [9], suggests that the country is a 'fertile ground' for e-commerce and cashless system to thrive. Thus, prospects for increased investment and e-commerce growth are evident. Furthermore, the

emergences of on-line businesses like Jumia.com, Konga.com, Kaymu.com and a number of other shows that potential for e-commerce is huge if relevant infrastructure and policies are provided in the ICT sector. To this end, this study assesses the prospect of Nigeria's ICT infrastructure in her quest for full implementation of e-commerce and cashless economy.

2. NIGERIAN ECONOMY AND ICT SECTOR

2.1 Overview of the Nigerian Economy

The introduction of Global System of Communication in 2000 brought about the transformation in the telecommunications service sub-sector leading to increase in the number of telephone lines, subscribers and services providers. It has also created massive employment within the country. As at December 2007, the number of telephone lines in Nigeria, has increased to almost 58 million lines (connected fixed and mobile lines). Nigeria has the fastest growing GSM market in the world, after China.

Irrespective of the transformation witnessed in the telecommunication service subsector, various economic and structural reforms were introduced from 2003 to boost the not so thriving economic conditions of the country. One of such reforms was the National Economic Empowerment and Development strategy (NEEDS). Recognizing that the financial services sector occupies a pivotal position in the economic development process of Nigeria, the NEEDS set out to build and foster a comprehensive and healthy financial system to support economic development. The strategies for actualizing NEEDS among others included embarking on a comprehensive reform process aimed at substantially improving the financial infrastructure; restructuring, strengthening, and rationalizing the regulatory and supervisory framework; addressing low capitalization and poor governance practices of financial intermediaries; directing government policies towards financial deepening and financial product diversification.

The Government of Nigeria has since sustained far-reaching economic reforms at the Federal level, particularly in public finance management, and the financial sector. The economic reforms and prudent policies have contributed to the

consolidation of macroeconomic stability and improvements in overall economic indicators.

Table 1. Ranking of sectoral contribution to GDP

Sectors	Contribution to GDP (Q1, 2012)	
	Rank	Percentage
Agriculture	1	35.14
Wholesale & retail trade	2	22.92
Crude petroleum & natural gas	3	17.18
Telecommunication & post	4	5.83

Source: [10]

Table 2. Some basic macro-economic indicators

Indicators	2011	2012
Real GDP growth	7.4	6.6
Real GDP per capita growth	4.9	4.1
Consumer price index inflation	10.9	12
Budget balance % GDP	-0.1	3.7
Current account % GDP	3.2	10.4

Source: [11]

Diverse challenges confronting economic growth and investment climate in the country have been identified. These challenges were underpinned by the core issue of governance, particularly at the state level. Fiscal decentralisation provides Nigeria's 36 states and 774 local governments considerable policy autonomy, control of 50 percent of government revenues, and responsibility for delivery of public services. However, owing to weak human capacity in most states, the deployment of ICT for improving governance (e-governance) is yet to be widely embraced [12].

2.2 Growth and Development in the ICT Sector

The Nigeria's ICT sector is one of the fastest growing sectors in the economy. In the first quarter of 2012, the Telecommunication and Postal sector was the primary driver of growth of the Nigerian economy. In the same year, the sector was the fourth highest contributor to the nation's GDP. A cursory look at the major drivers of the Nigerian economy as at the first quarter of 2012 as presented in Fig. 1 shows that Telecommunication and Post witnessed the highest growth rate of over 30%.

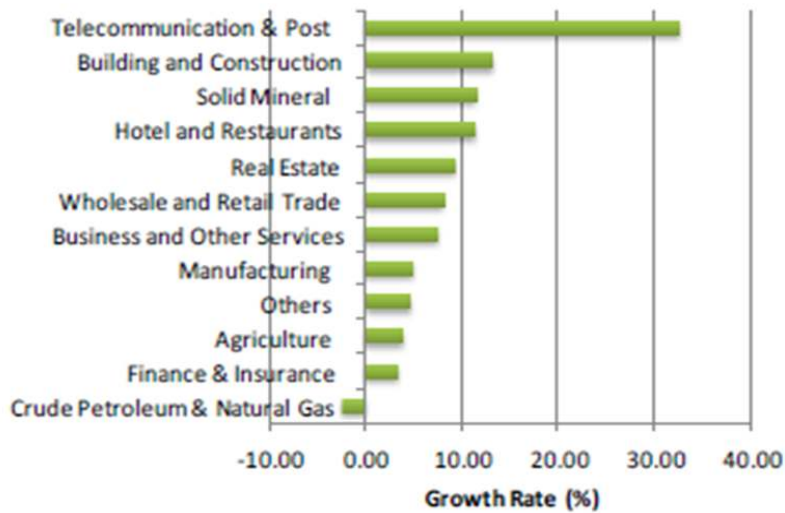


Fig. 1. Sector's contribution to GDP

Source: [13]

2.2.1 Estimated size of the Nigeria's ICT industry

In Nigeria, as depicted in Fig. 2, mobile networks operators and its associated value added services constituted the largest proportion of the ICT industry, followed by the device sales and distribution. The equipment sales and distribution also occupies a significant size in the industry. The least to reckon with is the software sales and distribution, indicating a whole lot of growth potentials in the industry.

Globally, it is widely acknowledged that investment in ICT is one of the major drivers of economic growth and development, especially in the developing economies which are characterised with lots of infrastructure deficiencies. In Nigeria, there are significant investment opportunities and growth prospects in this sector as a result of considerable physical and social infrastructure. According to the Federal Ministry of Communication Technology, investment requirement for first National Implementation Plan (2010-2013) is approximately ₦32trn (US\$212bn). Moreover, with the unprecedented inflow of FDI projects growth of nearly 20% since 2007 and 27% from 2010 to 2011 in Africa and about US\$72bn (£46bn) invested in new infrastructure per year by African governments and private sources;

telecom-related infrastructure accounts for about 30% of this US\$21bn (£13bn), there are still investment gaps in ICT infrastructural development in developing economies of Africa, and Nigeria is no exception.

2.2.2 Nigerian national policies on information technology and E-Commerce implementation

Information and Communication Technology (ICT) is a prerequisite for developing countries' economic success. The ability of developing countries to thrive in global economy depends on the national priority and the weight attached to their ICT policy. However, previous studies have shown that most of the developing countries especially Nigeria are yet to fully embrace the application of ICT in socio-economic and political life of the people [14,15]. The major clog in the wheel of progress with regards to the adoption and implementation of ICT policy in Nigeria is the government's indifference towards adequate investment in Information and Communication Technologies. Lee [16] asserted that the biggest hindrance to telecom service development has been the attitude of the government and the desire to control the population; many only see the huge expense and fail to see the benefits to a developing country from establishing an adequate telecommunications infrastructure.

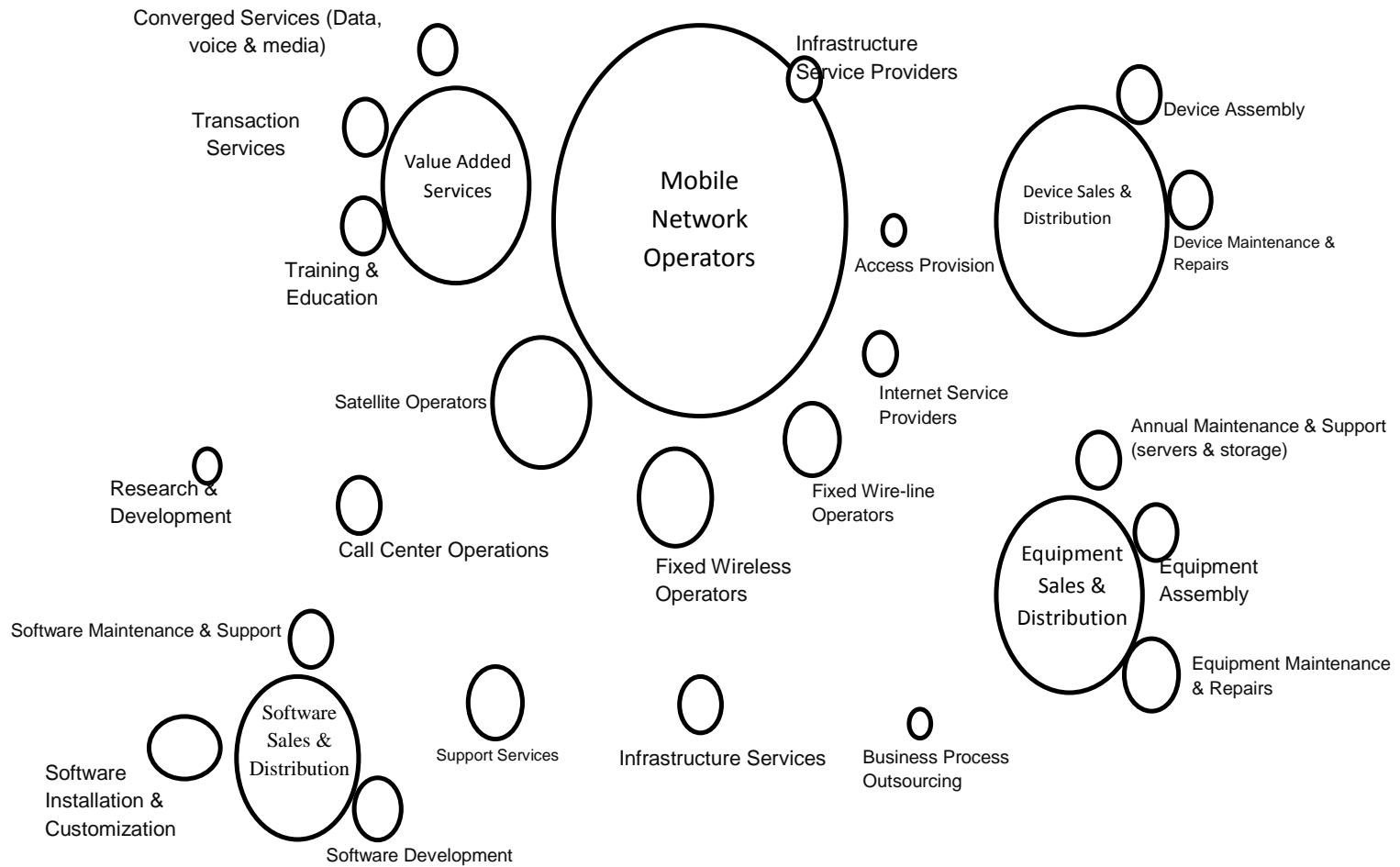


Fig. 2. Estimated size of the Nigerian ICT industry

Source: [17]

Some of the developing countries such as South Africa, Nigeria and Ghana have been making little progress in telematics (the convergence of telecommunications with computer technology) by linking production to industrialisation. South nations (Malaysia, Indonesia and Singapore) have adopted a strategy which aims at promoting industrialisation through applications of microelectronics, computer products, services in management, finance, health care, distribution, manufacturing, as well as education. This particular experiment in these nations may be a breakthrough in the developing nations, industrial and high technology policies. The success of these few is already having an impact on the world production patterns, trades and both the social and political environment [18].

2.3 Nigeria IT Policy

Nigerian government has developed a National Information Technology policy and an implementation strategy to drive the technological development across the country for increased competitiveness and fulfilment of vision 2020 and other developmental goals and targets. The policy aims to address a host of vital socio-economic issues such as reliable infrastructure, skilled human resources, open government and other essential issues of capacity building in order to transform the Nigerian economy from being agrarian to information-rich knowledge-based economy. The policy is handled by National Information Technology Development Agency (NITDA). NITDA is an agency under the aegis of the Federal Ministry of Science and Technology. This body is to be set up to ensure the achievement of the articulated National IT vision, foster and co-ordinate the accelerated development of IT in Nigeria and promote the efficiency and international competitiveness of the IT industry in Nigeria, among other responsibilities.

2.3.1 Nigeria IT policy on trade and commerce

A section of the policy on trade and commerce reiterated the Nigeria's government commitment to develop the country IT infrastructure and specifically how IT will be utilised to facilitate e-commerce, which subsequently will translate to firm's development and increased global competitiveness for the country. The policy statement is to create an enabling environment that empowers stakeholders in trade and commerce with the underlying infrastructure to

improve productivity and positively position the nation for global competition. The objectives of the policy are to develop a transparent, stable and effective legal operating environment that promotes private sector business and investment in IT, cultivate a culture of electronic commerce that makes business transactions easy, quick and cost effective, for both national and international transactions, to positively raise the local and international visibility of Nigerian businesses amongst others.

In order to achieve its objectives, the following strategies were suggested; protection of intellectual rights by bringing the copyright laws in line with the needs of a globally competitive economy, government, through NITDA, will collaborate with the private sector in the development of information infrastructure, permitting the private sector to establish Internet communication "backbone" facilities stimulated on market demand with minimal governmental encumbrance, raising the profile of Small and Medium-Scale Enterprises (SMEs) in exports through e-commerce by providing low cost accessibility to markets and services, establish a high profile National Electronic Commerce Council (NECC), to govern all the electronic commerce (e-commerce) affairs in Nigeria, and facilitate international trade through an e-commerce infrastructure. The NECC will be operated and supervised by NITDA with the cooperation of relevant Ministries and organisations amongst others.

However, of greater importance are the appropriateness and relevance of these policies in driving e-commerce and cashless system of operation in the country. The nation is yet to see the impact of the implementation of these policies in various sectors of the economy. The onus rest on the government and all stakeholders to ensuring that the policies are enforced and executed for smooth transition to a cashless economy.

3. METHODOLOGY

This paper is primarily a desk search of existing information on the dynamics of Nigerian ICT sector between the period 2000-2012 as documented in International Telecommunications Union (ITU) publications and other search engines. The data were explored to examine the status of ICT infrastructure in Nigeria with a view to providing evidence for policy making on the implementation of cashless economy, thereby

creating e-job for the young populace. Data collected were analysed using descriptive statistics and the results were presented using tables and charts.

there are still rooms for improvement and investment opportunities in the Nigeria's ICT sector so as to facilitate the implementation of e-commerce in the country.

4. DATA ANALYSIS AND DISCUSSION

4.2 Internet Penetrations in Nigeria

4.1 Internet Accessibility and Utilisation

Internet accessibility is a very important factor for consideration in e-commerce implementation. Nigeria, when compared with some other African nations, has a high proportion of households with computer and Internet access at home. The figure recorded in the table below indicates that

Internet utilisation in Nigeria has witnessed steady and consistent growth since 2000. The percentage of individuals using Internet grew from 0.1 in 2000 to 32.9 in 2012. This is an indication that most Nigerians now utilise internet facilities for various activities ranging from personal to business and trade transactions. Fig. 3 showed the growth rate of internet usage in Nigeria.

Table 3. Core indicators of access and use of ICT in Africa

Core indicators on access to, and use of, ICT by households and individuals								
	Year	Proportion of households with						
		(HH1) of latest data	(HH2) Radio	(HH3f) TV	(HH3m) Fixed line telephone	(HH4) Mobile-cellular telephone	(HH6) Computer	(HH6) Internet access at home
1	Angola	2010	...	...	...	...	7.1	5.7
2	Burkina Faso	2010	...	...	...	...	2.1	2.0
3	Congo	2011	54.0	47.0	...	81.0	3.9	1.0
4	Côte d'Ivoire	2010	...	...	...	...	1.8	1.1
5	Gabon	2010	...	...	...	...	7.6	6.0
6	Guinea	2010	...	...	...	...	1.4	1.0
7	Mali	2010	...	...	...	...	3.0	1.2
8	Nigeria	2011	...	...	...	...	9.3	4.6
9	Rwanda	2010	62.6	5.3	0.3	40.3	1.3	3.2
10	Senegal	2010	...	...	...	...	5.7	4.5
11	South Africa	2011	...	...	...	...	...	9.8
12	Tanzania	2011	...	...	...	...	4.0	4.5
13	Zambia	2010	...	...	...	...	2.4	2.0
14	Zimbabwe	2011	37.9	36.3	4.1	62.2	5.9	4.0

Source: ITU World Telecommunication/ICT Indicators Database

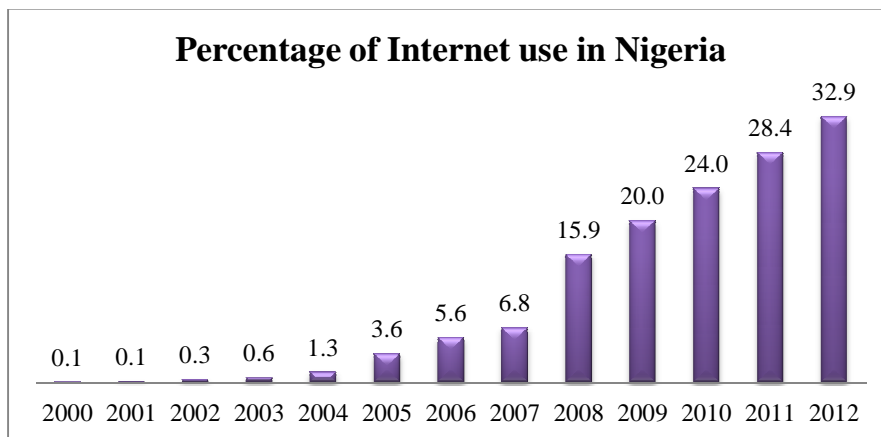


Fig. 3. Percentage of internet use in Nigeria

Source: ITU World Telecommunication/ICT Indicators Database (2013)

4.3 Broadband Subscriptions

A lot of growth opportunities exist in the deployment of terrestrial fibre-optic networks (including fibre-over-powerline), wireless broadband infrastructure and satellite networks (in particular those providing connectivity to the urban and rural areas). For instance, there was an unprecedented growth in broadband subscriptions from 53,597 in 2007 to 215,675 in 2011. This is an indication that broadband subscription is still growing in the country and business opportunities can be exploited in this area as shown in the Fig. 4.

4.4 Mobile-cellular Telephone Subscriptions

The top ten African markets account for over four-fifths of all mobile subscribers on the continent (Rao, 2011). One quarter of cellular mobile subscribers live in South Africa, followed

by Nigeria. Nigeria has opened up her market to multiple operators and service providers like MTN, GLO, ZAIN, ETISALAT. The government issued a round of new licensing, including:

- Three mobile cellular licenses in 2001, to MTN, ECONET and the incumbent NITEL;
- A Second National Operator (SNO) license to GLOBACOM in 2002 for all telecom services;
- More than a dozen local network operator licenses since 2000.

The results have been dramatic as teledensity has soared – by June 2006, there were almost 26 million fixed and mobile subscribers with a teledensity of over 22 subscribers per 100 inhabitants. Population coverage of mobile networks has increased from a mere 5 per cent in 2000 to over 75 per cent in June 2006 [19,20,21] Nigeria now has some of the most competitive fixed and mobile markets in Africa,

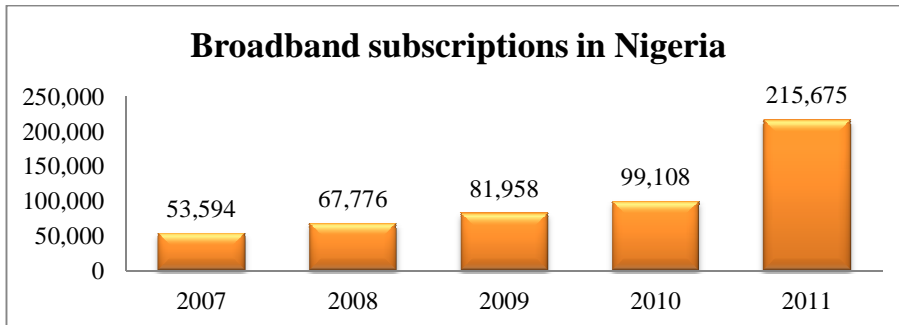


Fig. 4. Broadband subscriptions in Nigeria
Source: ITU World Telecommunication/ICT Indicators Database (2013)

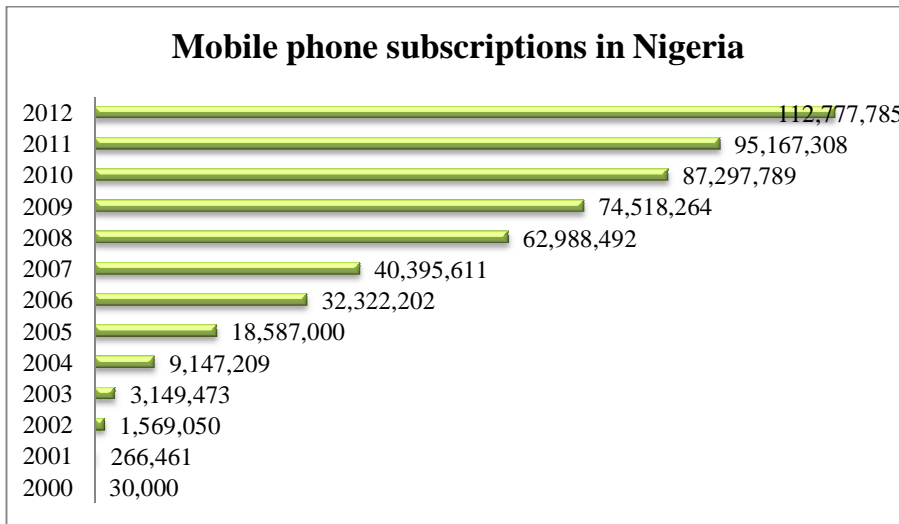


Fig. 5. Mobile phone subscriptions in Nigeria
Source: ITU World Telecommunication/ICT Indicators Database (2013)

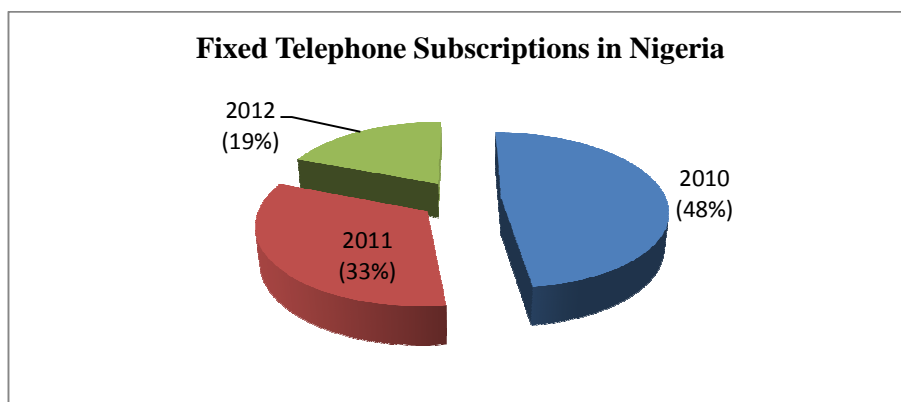


Fig. 6. Fixed Telephone subscription in Nigeria

Source: ITU World Telecommunication/ICT Indicators Database (2013)

with over twenty private operators accounting for nearly three-quarters of the 1.5 million fixed lines in operation at June 2006 [19]. Ten operators have launched IMT-2000 compliant CDMA 1x networks (some using Wireless Local Loop, WLL), while the mobile operator Starcom launched the second EV-DO network in Africa in February 2006 [19]. This startling growth, as depicted in the Fig. 5, revealed a very high prospect for the implementation of e-commerce in Nigeria.

4.5 Fixed Telephone Subscription

Due to the increase in the mobile-cellular subscription, there has been a drastic reduction in the fixed telephone subscriptions as depicted in the Fig. 6 above. This is an indication that investment prospects are tilted more towards the mobile subsector. This might be connected with the fact that mobile cellular facilitates more of online/Internet transactions than fixed telephone subscriptions.

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

From the foregoing, it is evident that Nigeria has a whole lot of investment and business prospects in her ICT sector, especially in terms of infrastructure. The Internet and mobile cellular subscriptions are on the increase and show a great expansion potentials, which the private sector can exploit for further investment and growth of the ICT sector. Furthermore, the ICT policy needs to be fully implemented while public-private sectors collaboration and partnership should be strengthened especially at the national level. Government at all levels should support and promote the growth of ICT

sector by dedicating special funds and resources for the expansion of ICT infrastructure in the country. ICT education should be inculcated in the school curriculum right from the primary education to the tertiary institutions in order to increase the knowledge base and develop human capacity of the economy. On the average, Nigeria's ICT sector has shown immense prospects and possibility for future growth and development especially in helping to facilitate full implementation of the current campaign for a cashless economy and e-commerce. While there are huge potentials in this sector, it is noteworthy that there are challenges facing the growth of the sector. This is another area for further research.

DISCLAIMER

Earlier version of this manuscript was presented at the 1st International Conference on Strengthening Nigeria's employment potentials: The role of Entrepreneurship in developing Economy" available link is: https://www.researchgate.net/publication/268808036_Prospects_of_Nigeria%27s_ICT_Infrastructure_for_E-Commerce_and_Cashless_Economy

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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