

COMPUTER TELECOMMUNICATION AS AN EFFECTIVE TOOLS GLOBALIZATION

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Abstract: Globalization allows the transmission of knowledge as a much greater pace than in the past. The impact of telecommunication technologies has been felt in almost all sectors that are particularly important in globalization. The advent of computer telecommunication towards the middle of 20th century and beyond has proven to be the driving force and effective tools for globalization. There is universal recognition of the need to use telecommunication for nation development as we enter the era of globalization where the free flow of information via satellite and the internet hold way in global information dissemination of knowledge. The development of computer technology, including developments in broadcasting communications, formed a powerful tool in the globalization process. Now multinationals based in the industrialize world have access to all parts of the world. This paper, therefore, dwelt on the impact of computer telecommunication in significant area in Nigeria such as the Internet, Satellite, Communication technology, and industrial technology. Hence it examined the concept of telecommunication. These technologies can be seen as an effective tool for globalization.

Keyword- Globalization, Telecommunication, Nigeria Communication Commission, Tool

Introduction

Globalization accelerates the change of technology. In sum, globalization is a new historical reality and enacted through the powerful medium of new information and communication technologies (Castells, 1999). The pace of change occurs so rapidly, many people are always playing catch up, trying to purchase or update their new devices. Computer telecommunication is now the forefront of the modern world creating new jobs, innovations, and networking sites to allow individuals to connect globally. The timeline below shows the rapid transformation of how technology has accelerated within the last 20 years to 2014.

- **18 years ago:** Internet commercialized
- **17 years ago:** first mobile phone with Internet connectivity
- **15 years ago:** Google named the search engine of choice by PC magazine
- **12 years ago:** Blackberry launched

- **9 years ago:** Facebook launched
- **7 years ago:** Twitter launched
- **6 years ago:** iPhone, the first of the smart phones, introduced
- **5 years ago:** Group on introduced
- **3 years ago:** 17 million smart tablets sold — estimated that 100 + million by 2014
- **1 year ago:** Google Glass announced
- **Every 60 seconds** (so it seems): new apps, tailored to users' specific needs created

1.1.2 Six Processes of Globalization

Globalization is such an expansive and intricate concept that it is often hard to define, but in the same way, because of its breadth there are many different takes on just what globalization is. Two well-respected anthropologists (Inda and Rosaldo 2002) define globalization as, “the intensification of global interconnectedness, suggesting a world full of movement and mixture, contact and linkages, and persistent cultural interaction and exchange”. The six processes that merge together to provide a solid foundation of what exactly globalization is (Inda and Rosaldo 2002).

1) Speeding Up of flows of capital, people, goods, images and ideas across the globe. Through increased communication, transportation and technology, flows have quickened immensely. Basically this is the quickening of actions that used to take much longer to complete. For example the mail system, it used to take weeks to transport a piece of mail during the period of the American Revolution, now you can mail objects across the globe instantaneously.

2) Intensification of the links, modes of interaction and flows that interconnect the world. Meaning, much more information is given to you at one time than ever before. For example in the 1940's all you had for news was the radio, now, on your computer screen you can have feeds from 10 different news sources, while getting news on your cell phone and watching the news on TV all at the same time.

3) Stretching Out of social, cultural, political and economic practices across frontiers. This means that practices and decisions made in one part of the world can have consequences on communities and cultures in other locations around the world. For example when North Korea began testing nuclear weapons it had a huge political and social effect on the

rest of the world as many countries saw it as an imposing threat and gesture by the country.

4) Interdependency of the global and the local landscape such that, while everyone might continue to live their local lives, their actions made in their local environment have become global events that come back to have an impact on local spaces.

5) Anti-Eurocentric movement from the practices that take European or Western values, concerns, good and culture and place them on other countries located around the globe. By getting away from Euro-centrism, there is now also movement that occurs between periphery (smaller, less powerful) countries and from periphery countries to the Western countries. It used to be that all values, goods, and cultures came from the United States and European countries and were then passed to everyone else, but now values, goods, and cultures come from all over the world and are shared to any number of countries across the globe.

6) “Westernization” does not occur, in the sense that people absorb ideas, values and lifestyles from Western Civilization. People now customize their own ideas, values and lifestyles. Meaning that people do not just take what is provided for them, people now shape and form their own ways of living that was once not the case. Now immigrants assimilate somewhat to American life, but for the most part they make their own way of life that is unlike any others. The six italicized terms are the names of the six processes that should be remembered when thinking of globalization.

1.2 TELECOMMUNICATION

Two of the most powerful forces in the world today are the spread of Information and communication technologies (ICT) and the global effort to achieve more widespread social.

Telecommunication could open up new possibilities for more transparent and inclusive public administration/ governance everywhere by opening up direct channels to the arenas of decision making, and by engendering a proliferation of public spheres and stronger civil-society networks brought together by the “death of distance”. It could become the engine of redistribution of knowledge and expertise in the areas of education and public health. It can manifest itself internationally and within communities and is shaped by the economic, political, and sociological context in which it occurs (Guillén and Suárez, 2005). It could pave the way for an inclusive economic sphere by lowering entry barriers for e-commerce and provide two-way flow of good knowledge and ideas to any and all. Telecommunication is the technology of sending signals, images and messages over long distances by radio, telephone, television and satellite. The role of computer telecommunication technology is rapidly becoming the most important and widely discussed issues as tools for globalization. Most experts in the field of engineer-

ing agreed that, telecommunication technology hold great promise to improve influencing workforce opportunities. Poole (1996) has indicated that computer illiteracy is now regarded as the new illiteracy. In the rapidly changing world of technology, it is difficult to keep pace of developments. As one form of communication is overtaken by another, the inherent possibilities of more varied forms, and patterns of communications become more complex. It is only since the early 1980s that computers have become so common place and have become transformed from the bulky ‘mainframes’ to the stand alone, personal pieces of equipment populating many desks. When one adds to this the ways in which computers can now be connected to each other via electronic mail networks (e-mail) or facsimile modems, the potential for faster and more efficient forms of communication is obvious. It is clear that the relations between working and living, within the workplace, in cultural forms, are indeed changing rapidly in response to informational technologies (Harvey 2000).

2.0 DEVELOPMENT OF THE NIGERIAN TELECOMMUNICATIONS

The Commission was established in 1992 as the independent National Regulatory Authority for the Telecommunications Industry in Nigeria. The Commission is responsible for creating an enabling environment for competition among Operators in the Industry, as well as ensuring the provision of high quality and efficient telecommunications services throughout the country. The Nigerian Telecommunications market was liberalized 23 years ago and has been highly active in the last ten years, as illustrated in Figures 1a, 1b and 1c.

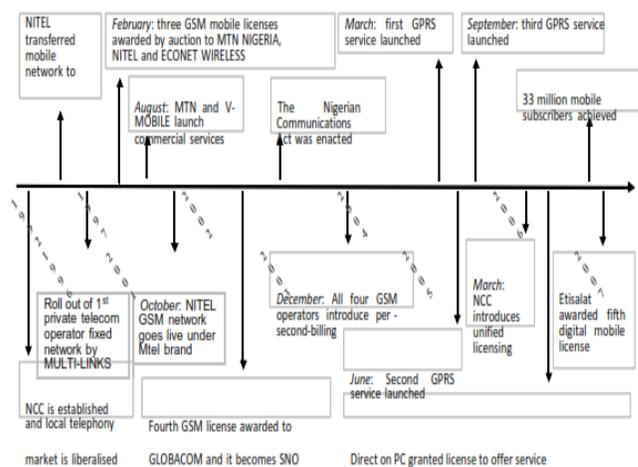


Figure 1a: Selected Developments in the Nigerian Telecommunications Market (Source: NCC, 2014)

ria has growing levels of PC penetration, Internet take-up and broadband adoption

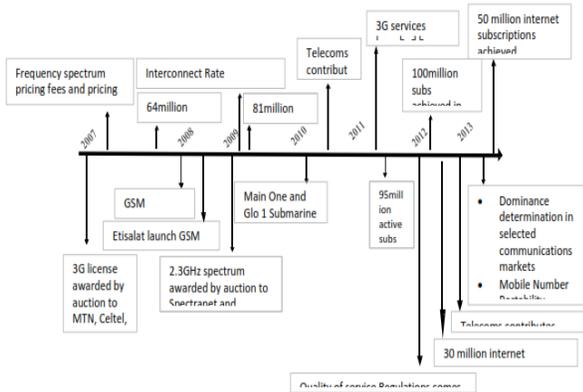


Figure 1b: Selected Developments in the Nigerian Telecommunications Market (Source: NCC, 2014)

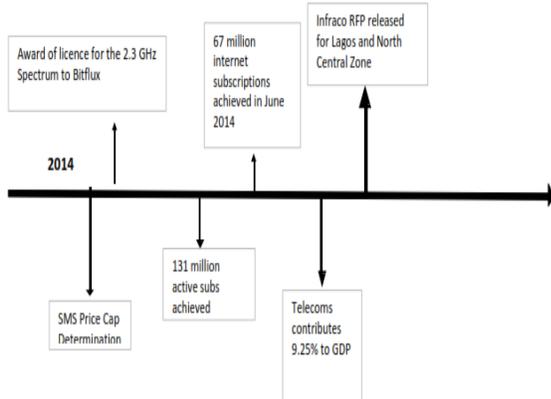


Figure 1c: Selected Developments in the Nigerian Telecommunications Market (Source: NCC 2014)

The deregulation of the Telecommunications market was marked by the passing into law of the Nigerian Communications Commission Act 1992, which allowed private companies to participate and invest in the development of the country's Telecommunications infrastructure and services.

2.3 THE TELECOMMUNICATIONS MARKET

2.3.1 Market Growth

The Nigerian Telecommunications market has experienced significant growth in recent years. By June 2014, the market had increased from about 400,000 in 2001 to about 131million active subscribers (Nigerian Communications Commission, 2014). Key features of this growth include:

- Mobile penetration grew from less than 1% in 2001 to more than 93.41% in June 2014
- Mobile take-up was driven by liberalisation and competition
- Nigeria has significant potential , being a large nation with growing population and economy. Nige-

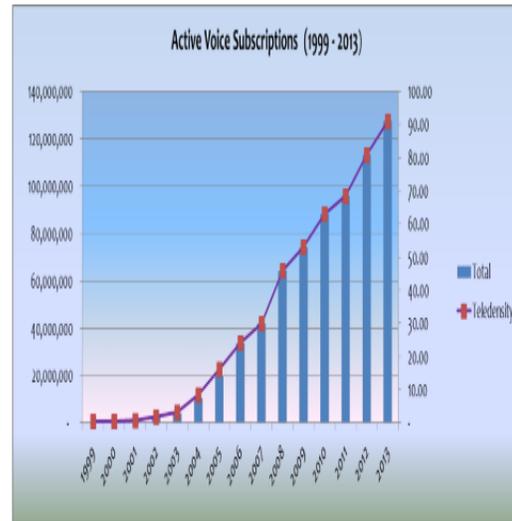


Figure 2: Subscriber Data- Active Voice Subscriptions & Teledensity (1999 - 2013)

2.3.2 INTERNET PENETRATION

Nigeria currently has growing levels of Internet take-up, PC penetration and Broadband adoption. The trend of Internet use in Nigeria shows an increase with the overall number of users rising from 1.4% of population in 2004 to about 47.8% by 2014(National Bureau of Statistics, 2014) with Broadband penetration at about 6.1% in 2013. Access to PC in Nigeria was estimated at 8.1 % (National Bureau of Statistics, 2014) of the population in 2013

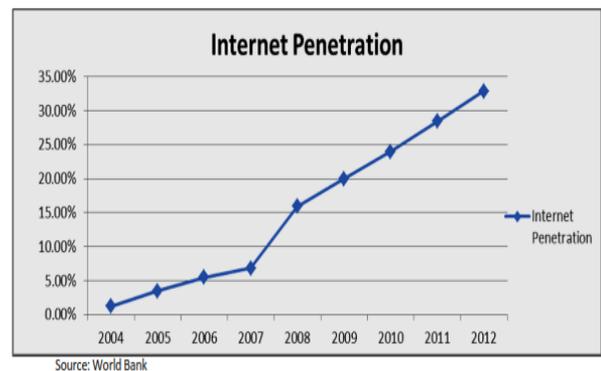
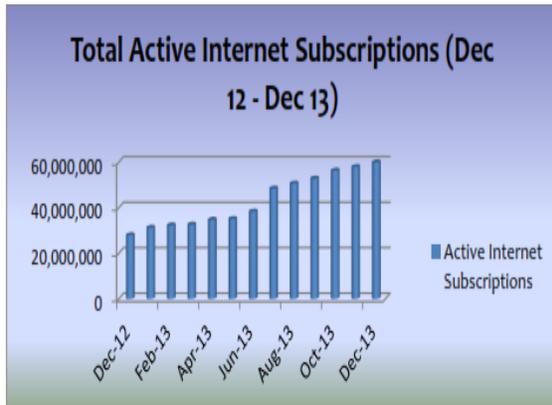


Figure 3: Internet Penetration in Nigeria (2004 – 2012)

As at December, 2013 the total active internet subscriptions for all market segments was 64,417,110. There was a steady growth in the number of active internet subscriptions from

December, 2012 to December, 2013 and this growth was primarily driven by the growth in the Mobile GSM market segment. The Mobile GSM market segment accounted for 64,229,097 of the total active internet subscriptions.

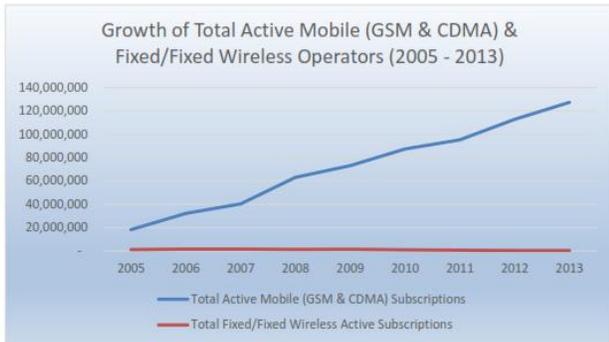


Source: NCC 2014

Figure 4: Total Active Internet Subscriptions as at December, 2013

2.3.3 Mobile Penetration

Mobile penetration in Nigeria has been on the upward trend; however, the penetration of fixed services is still low.



Source: NCC, 2013

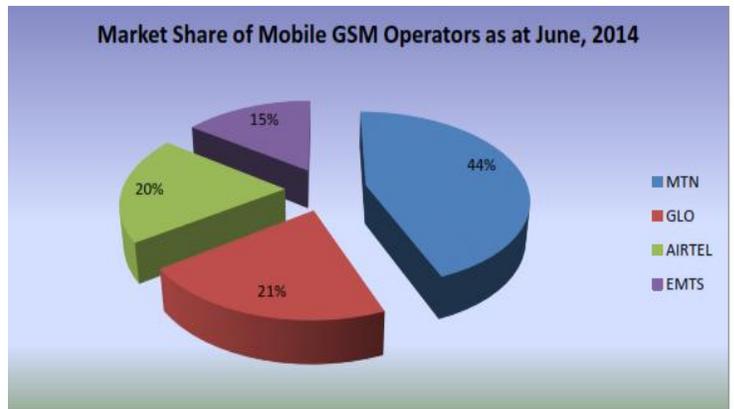
2.4 PROFILE OF NETWORK OPERATORS

2.4.1 Network and Service Providers

Since the full liberalization of the Nigerian Telecommunications Market in 2000, there has been considerable growth in the number of active network operators and service providers. Some are shown Table 4.

Table 1: Network Operators

S/N	Company	Technology Deployed	Coverage Areas
1	Celtel (Airtel)	GSM/WCDMA/UMTS	Nationwide
2	Glomobile	GSM/ WCDMA/UMTS	Nationwide
3	M-Tel	ETAC/GSM	Nationwide
4	MTN	GSM/ WCDMA/UMTS	Nationwide
5	EMTS	GSM/ WCDMA/UMTS	Nationwide
6	Starcomms	CDMA	Nationwide
7	Multilinks	CDMA	Nationwide
8	Visafone	CDMA	Nationwide
9	intercellular	CDMA	Nationwide
10	NITEL	Landline/CDMA	Nationwide
11	Spectranet	LTE (TDD)	Nationwide
12	Mobitel	LTE (TDD)	Nationwide
13	Swift Networks	LTE (TDD)	Abuja, Lagos, PHC
14	Smile Communications	LTE (FDD)	Nationwide



Source: NCC, 2014

Figure5: Market Share of Mobile GSM Operators.

2.4.2 Demand for High Speed Internet

Fixed Internet access in Nigeria is limited while mobile internet services are more readily available. There are a wide range of economic sectors which need higher speed Internet access, these include:

Government Services

The Nigerian Broadband Plan 2013-18 lists a wide range of e-government services which need to be introduced as soon as possible. These include issuing National Identity Cards, driving licenses and registration of companies among many others. In order to introduce these services individual departments require high speed internet access, so from government quarters there is a large latent demand for broadband access service from providers.

Agriculture

African economies continue to be heavily dependent on agricultural production and the export of natural resources. The widespread adoption of technology holds considerable promise for African countries in their quest to improve their



agricultural production and marketing practices. It provides opportunities for the development of telecommunication systems to monitor water and land resources, food transportation and storage and crop-diseases control. Video and radio-conferences between buyers and sellers, growers and extension officers, can also play important roles in stimulating internal and external trade and improving agricultural practices and productivity. It could also facilitate the use of more efficient distribution systems to reduce food storage costs. With information technology, access to world-wide knowledge about new techniques for improving agricultural production would be considerably enhanced. Nigeria is a large country with an area of over 900,000 km² having a huge and diverse agricultural sector. 44.6% (World Bank 2005) of the labour force is engaged in agriculture and agricultural businesses have a potential need for internet access in order to check market prices and find information about the latest farming practices.

□ Commerce

There is a considerable market gap for reliable and affordable high-speed internet access for both large and small companies in Nigeria. Companies are very keen to make greater use of the internet because of the opportunities to improve efficiency and enable cost savings. The increased usage of Point of Sale (POS) Terminals and electronic payment systems has increased the addressable Internet access market.

□ Education

Most educational institutions in Nigeria lack reliable and widespread internet access, so there is a large demand for high speed services. These would be used for teaching, learning and research as well as improving the efficiency of the organizations.

□ Entertainment

There are several industries in the entertainment sector which will be able to develop their businesses if high speed internet access is more widely available. Video streaming services are constrained in Nigeria because of a lack of widespread broadband services. Being able to expand this area would greatly benefit the film and TV industry.

□ Public Safety

Close Circuit Television (CCTV) services could expand greatly with access to high-speed internet services, as these make the remote monitoring of video footage much easier. The potential expansion here would cover government, business and residential users. Furthermore, in emergency situations coordination of rescue efforts becomes much easier with high-speed internet access.

3.0 Computer Telecommunication as a Tool for Globalization

The need for computer telecommunication as a tool in globalization cannot be over emphasized. In this technology-

driven age, everyone requires computer telecommunication competence to survive. Private enterprises are finding it very necessary to train and re-train their employees to establish, increase their knowledge of computers telecommunication facilities (Adomi and Amic, 2006). There are some key terms that need to be made aware of, in order to better understand the broad effects of globalization. One over-arching effect that globalization has brought is called “time-space compression”, meaning the transition between moments and distances between spaces are being shortened and reduced. It currently takes much less time to get tasks done than ever before and geographic distance is no longer an obstacle that must be overcome. Different cultures can now communicate and connect with each other from all different parts of the world like never before. From a social standpoint these two factors contribute to the largest and most important effects of globalization. It could not examine all of the effects of globalization in a single paper, let alone this brief introduction. The ability to use computers effectively has become an essential part of everyone’s education. The demand for computer literacy is increasing in Nigeria, because educators realize that computers telecommunication facilities can enhance entrepreneur education. With the high demand for computer literacy, the teaching and learning of these skills is concern among entrepreneurs’ educators (Brakel, 2003). In schools where new technologies are used, students have access to tools that adjust to their attention span and provide valuable and immediate feedback for literacy enhancement, which is currently not fully implemented in the Nigerian school system (Enuku & Emuka, 2000). Telecommunication as a tool will prove beneficial in improving Nigeria’s educational system and giving students a better entrepreneurship education.

3.1 Technological Innovation

Knowledge can be liberating and as such it has the potential of changing traditional understandings and ways of doing things (Hill, 2007). Although falling barriers to trade and investment encourage globalization, technological innovation is accelerating its pace. Significant advancements in information technology and transportation methods are making it easier, faster, and less costly to move data, goods, and equipment around the world. To examine several innovations that have had a considerable impact on globalization.

3.1.1 E-MAIL AND VIDEOCONFERENCING

Operating across borders and time zones complicates the job of coordinating and controlling business activities. But technology can speed the flow of information and ease the tasks of coordination and control. Electronic mail (e-mail) is an indispensable tool that managers use to stay in contact with international operations and to respond quickly to important matters. Videoconferencing allows managers in different locations to meet in virtual face-to-face meetings. Primary

reasons for 25 to 30 per cent annual growth in videoconferencing include lower-cost bandwidth (communication channels) used to transmit information, lower-cost equipment, and the rising cost of travel for businesses. Videoconferencing equipment can cost as little as \$5,000 and as much as \$340,000. A company that does not require on-going videoconferencing can pay even less by renting the facilities and equipment of a local conference centre.

3.1.2 INTERNET AND SATELLITE

The benefits of online information are a source of great optimism and offer immense potentials for Telecommunication to fill a large learning resource gap in the developing world. Computer telecommunication is access to the wealth of knowledge available through the Internet can be powerful sources of such information and in this sense; such information can be highly beneficial and influential for human development. The application of Telecommunication technologies requires human capabilities to handle such technologies (Lee, 2001). This is a primary reason for many in the field of education to advocate that the biggest role of Telecommunication in education is their use as means to enhance learning. Companies use the Internet to quickly and cheaply contact managers in distant locations, for example, to inquire about production runs, revise sales strategies, and check on distribution bottlenecks. They also use the Internet to achieve longer term goals, such as sharpen their forecasting, lower their inventories, and improve communication with suppliers. The lower cost of reaching an international customer base especially benefits small firms, which were among the first to use the Web as a global marketing tool. The contents of online communications have the ability of travelling between the physical and virtual worlds, and back again, both in developed and developing countries (Lim, 2003).

Satellite communication networks such as digital radio are generally used to provide voice as well as data communications between mine sites and corporate headquarters. Satellite systems include very small aperture terminals (VSATs) which provide several channels for voice and data, and even video and video conferencing. Such a fixed-site system can provide the basic communication system. For mobile workers, other systems provided by mobile satellites such as Inmarsat provide voice and data communications with small terminals similar to laptops that have antennas built into the lids which send and receive the signal to the mobile satellites. The most recent satellite technology of Big LEOs (a space-based network for cellphones, or satphones as they are now called) such as Iridium provides voice communications and was designed for global coverage to reach the remote sites not covered by cellular networks. Satellite phones have also allowed rural areas and places without internet to become interconnected. According to statistics, 97 percent of 18-29 year olds in the US currently use smart phones to send text messages. Asian countries have the most smartphone users of any other region with the top countries in the region being Japan, South Korea, and China (SiliconIndia, 2013).

The most common activity of smart phone users includes texting and using the phone as a portable GPS. This has enormous implications within the spheres of business as people can be available to work through their phones even when they are nowhere near an office. With the rise in the use of higher tech devices, such as smart phones and tablets, along with the use of cloud services, virtual offices are becoming more common, especially as companies look to drive down costs of operation (Alexander, 2013).

3.1.3 COMPANY INTRANETS AND EXTRANETS

Internal company Web sites and information networks (*intranets*) give employees access to company data using personal computers. A particularly effective marketing tool on Volvo Car Corporation's (www.volvocars.com) intranet is a quarter-by-quarter database of marketing and sales information. The cycle begins when headquarters submits its corporate-wide marketing plan to Volvo's intranet. Marketing managers at each subsidiary worldwide then select those activities that apply to their own market, develop their marketing plan, and submit it to the database. This allows managers in every market to view every other subsidiary's marketing plan and to adapt relevant aspects to their own plan. In essence, the entire system acts as a tool for the sharing of best practices across all of Volvo's markets. Extranets give distributors and suppliers access to a company's database to place orders or restock inventories electronically and automatically. These networks permit international companies (along with their suppliers and buyers) to respond to internal and external conditions more quickly and more appropriately.

3.1.3 Open Source

Open source software projects reach the market much quicker than traditional software programs. Because open sourced products are constantly being improved and updated, there is little reason to purchase software that only come out once a year. Open source software saves organizations millions of dollars in information technology. One of the most popular open source software today is in education, which allows schools that are hurt by budget cuts to move from paying for closed source tools to free open source options, such as switching to Linux, a free open source operating system, The benefits of this software will be seen in the future as more schools continue to adopt it as an alternative (Morrison, 2013).

3.2.3. Cloud Computing

Cloud services have become increasingly popular in the business world in recent years. The basis of cloud computing is that data is not stored on a person's physical machine but hosted in third party pools known as the cloud. This allows for businesses to store more information without having to worry about failure of their own computers and risk losing vital information. This type of storage has already been



adopted by Amazon, Google, and Microsoft. It is estimated that 74 percent of enterprises now use cloud computing. There has been a 19% increase in usage of the service since 2009 (Lynn, 2011).

These services also allow virtual collaboration on projects that can also be worked on simultaneously, making meetings and traditional office work obsolete. One of the key benefits to cloud storage is the ability to recover from a disaster, since the data is stored in a third party location any problems can easily be mitigated. However, there have been concerns about the security of data that is stored in the cloud and whether this information could be sabotaged easily. Cloud storage is also used by individuals who enjoy the convenience of having their data readily accessible from any machine.

Conclusion and Recommendations

The computer telecommunications is reaching saturation point in the developed world, so attention has shifted to Africa, as one of the last emerging markets. The emerging global infrastructure could make it increasingly possible for students to study and carry out research using the electronic networks to reach remote universities and libraries. Physicians could remote-view entire images and patient data, diagnose diseases and perform consultations with outside sites. Decision makers would be able to promote effective economic management and good governance; and for businesses to complete more effectively with timely and accurate market information, to name a few. For Africa, information and telecommunication innovations present opportunities for "leapfrog" strategies that could accelerate the development of the continent. To exploit these opportunities, African countries need, as a matter of priority, to upgrade their capabilities through the improvement of their telecommunication infrastructures and the acquisition of computer and computer related equipment. National institutions responsible for data collection and processing need to be strengthened and their traditional information collection and dissemination structures need to be modernized if they are to fully participate in the international information evolution 'Globalization'.

Recommendation

African governments have to facilitate computer telecommunication transmission and connectivity to the global infrastructure by passing the necessary laws and regulations. Governments need to create the supportive external environment for promoting the use of telecommunication technology. It will be essential to reduce or abolish import taxes on information technology hardware such as computers, printers, satellites, televisions and radios. In some African countries such equipment are treated as luxury items and, hence, heavily taxed. The numerous long term benefits from

encouraging the use of information technology through the reduction of taxes on hardware would more than offset the loss of government revenue. These desired improvements need to be pursued within the framework of comprehensive national or sub-regional plans to link African countries to each other and to the global information technology infrastructure.

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References

- [1] E.E. Adomi, "Internet development and connectivity in Nigeria Program" 39(3):257-58, 2005.
- [2] E.E. Adomi and S.O, "An assessment of computer literacy skills of professionals in Nigerian university libraries" Library Hi Tech News 23(2)10-14, 2006
- [3] A.Alexander," Smartphone usage statistics and trends" 2013, February 19. Retrieved from <http://ansonalex.com/infographics/smartphone-usage-statistics-and-trends-2013-infographic/>
- [4] Castells Manuel , "Information Technology, Globalization and Social Development", UNRISD Discussion Paper, No. 114, pp.1-23, 1999.
- [5] U.A Euka and O. Euka, "Breaking down the walls. Computer application in correctional/prison education". Benin Journal of Education studies 12113 (112):64-71, 2000.
- [6] Go-Gulf, ("). Smartphone users around the world- statistics and facts. Retrieved from [http:// www.gogulf.com/blog/smartphone/](http://www.gogulf.com/blog/smartphone/)
- [7] M.F. Guillen and S.L. Suarez, "Explaining the Global Digital Divide: Economic, Political and Sociological Drivers of Cross-National Internet Use" Social Forces 84 (2): 681-708, 2005.
- [8] M. Hill, "Confronting Power through Policy: On the Creation and Spread of Liberating Knowledge", Journal of Human Development 8 (2): 259-282, 2007.
- [9] J.X Inda and Rosaldo, "A World in Motion' in JX Inda & R Rosaldo (ed), Anthropology of Globalization, Blackwell Publishing, Malden M.A, pp. 1-34, 2010.
- [10] J.W Lee, "Education for Technology Readiness: Prospects for Developing Countries" 2001

- [11] M. Lim, "The Internet and Public Sphere in Indonesia. In K.C. Ho, R. Kluver & K. Yang (Eds.) Asia Encounters the Internet", 113- 128. London: Routledge, 2003.
- [12] N. Morrison, "Technology in schools: saving money with cloud, open source and consortia", retrieved from <http://www.guardian.co.uk/teacher-network/teacher-blog/2013/feb/21/technology-cost-savings-school-cloud-open-source>, February 21, 2013.
- [13] SiliconIndia, 12 most smartphone addicted countries on earth. Retrieved from <http://www.siliconindia.com/news/technology/12-Most-Smartphone-Addicted-Countries-On-Earth-nid-142985-cid-2.html> (2013, March 11).
- [14] World Bank, "Information and communication technologies" A World Bank Group Strategy. Washington, DC: The World Bank.2002

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