

Africa's Connectivity

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ABSTRACT

The new millennium is beginning to realize the continual efforts Africa is making in quest for greater connectivity. Internet connectivity is very crucial to make Africa engage competitively in the global economy because we are in an emerging Internet age in which information equals power. This paper presents how the Internet, the Information Superhighway, can help in developing countries in Africa.

Key Words: *Internet connectivity, fiber optics, satellites, mobile phones*

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INTRODUCTION

Information and communication technologies (ICTs) are critical catalysts for growing economy. They are also critical for social and economic development within a nation and between developed and developing countries. Unfortunately, the network connection in African countries is marginal at best. Of all the developing regions, Africa is the least Internet-connected and the least integrated into the global economy.

One key to unlocking this challenge is connectivity. Internet or electronic connectivity consists of computer networks with software applications spanning the globe. The growth of Internet connectivity depends on the ubiquitous presence of high speed and intelligent electronic networks. Accordingly, the Internet infrastructure layer includes companies that manufacture or provide products and services. The elimination of geographical boundaries supports the formation of communication networks that are based on shared interests.

Internet penetration rate in Africa is low when compared to the rest of the world as shown in Figure 1 [1]. This is due to some factors. Government and religious organizations are concerned about the complete openness and lack of regulation of Internet. Fearing its subversive potential, governments try to erect legal and technical barriers limiting its free use. Other factors limiting penetration of the Internet include the relative high cost of computer hardware, excessive telecommunication charges in many countries, and the fairly limited computer literacy [2].

ENABLING TECHNOLOGIES

A number of projects have been initiated to bring connectivity and more bandwidth to Africa. Various technologies have been employed to enable digital connectivity in Africa. These include optical fibers, satellites, mobile phones, WiFi, WiMax, CDMA, and GSM. These technologies have brought profound changes in the telecommunication sector in Africa during the past decade. We will consider some of these.

1. Fiber Optics Infrastructure

Optical fibers are being used in global communication infrastructure at an astonishing pace. Optical networks are high-capacity communications networks based on optical technologies and components that provide routing, grooming, and restoration. Factors that are driving the need for optical communications include fiber capacity (or high bandwidth), high transmission rate, low attenuation, electromagnetic immunity, and security [3]. Fiber optic networks offer very high bandwidth necessary for African nations to be competitive in the new global information technology and economy. The only problem with fiber deployment is that it is very time consuming and expensive [4].

At least four projects for an underseas backbone in the Indian Ocean have been started. The first cable system is EASSy (East African Submarine cable System), sponsored by the World Bank and the Development Bank of Southern Africa. The Kenyan government has started a similar project named TEAMS (The East Africa Marine System).. A third project, SEACOM, is completely African-owned [5]. The

fourth project is Africa One, which has been the most popular.

The Africa ONE Internet project will encircle Africa with fiber-optic lines with 41 landing points in African countries in addition to Saudi Arabia, Greece, Spain, Portugal and Italy. Africa One, Ltd was owned by Columbia Technologies of New Jersey, USA. The project was first proposed in 1993. It is intended to provide state-of-the-art connectivity for the entire African continent, at low cost and with unparalleled reliability [6]. The project collapsed due to the downturn in the telecommunications industry. There are now 16 undersea cables connecting Africa to the Americas, Europe and Asia.

African fiber optic companies like Liquid Telecom are working to make fiber Internet a reality across Africa. Liquid provides Internet connectivity to 16 countries such as the Democratic Republic of Congo, Rwanda and Zimbabwe, through both satellite and cable connections.

When a fiber-optic cable connects Nigerian cities, someone in Kano can have a face-to-face business transactions with his business partners in Lagos without leaving Kano. In the same way, students will use the Internet to access educational materials online. One can apply and find jobs online.

2. Wireless Systems

Fiber optics cable laying in Africa has mostly been restricted to big cities, where only 37% of Africa's population live. Wireless broadband and satellite are the most effective way to reach rural areas where the majority of the population lives.

Satellites are used mainly for global communications. They are not replacement of the existing terrestrial systems but rather an extension of wireless systems. They have the unique ability to cover the globe. Users can enjoy untethered mobile communication anywhere within the satellite coverage area. A satellite system will not suffer from disasters such as flood, fire, and earthquake.

Mobile phones are the most ubiquitous modern technology. They not only empower individual users, they enrich their livelihoods and boost the economy as a whole. The use of mobile phones has become widespread worldwide, particularly in Africa. This has led to financial services, such as mobile money, mobile payment, and mobile banking which have fostered financial inclusion [7]. Across Africa, mobile phones spur innovation and boost incomes: farmers use them to check market prices before selling to middlemen, and market traders can accept payments in mobile money. Mobile phone networks have the potential to influence human development in remote villages.

The mobile infrastructure has become as important to national economies as transportation and energy infrastructures. Mobile phones have revolutionized the way Africans get online. Most get into the cyberspace directly on their phones rather than on computers connected through fixed lines [8]. Besides providing voice communication and Internet access, mobile networks in some African countries now facilitate business financial transactions than the banking industry. Mobile and online businesses will be the future of Africa's success.

BENEFITS OF CONNECTIVITY

Internet connectivity brings a lot of benefits to Africa. These include online education, digital economy, reduction in digital divide and poverty, and open government.

- **Education:** Education is widely recognized as a source of human capital which is a useful way of encouraging social and economic development. It is an insurance against poverty. Internet connectivity enables online education. There are several reasons why online education is growing in popularity and has attracted people from diverse groups. Perhaps the greatest, initial appeal for online education is its convenience, accessibility, and availability to learners. Online education improves access to higher education and makes it possible for more people to attend college. It makes the best quality education and educators available to the whole world. Access to the world's top professors is priceless [9,10].
- **Economy:** A robust Internet infrastructure will greatly help in building wealth, creating jobs, and improving the quality of life. The benefits in the Internet economy are not uniformly distributed across nations. Active participation in the Internet economy requires dedicated Internet access which is limited and expensive in developing nations. Since mobile phones are prevalent in these nations, it seems that accessing the Internet over mobile networks will become a major, if not the dominant, mode. The government of each nation must provide an environment where the "new economy" can thrive [11].
- **Reduce Digital Divide & Poverty:** Digital divide and poverty are extreme in Africa. Digital divide refers to the inequality of access to the Internet technology. It is about the disparity between the technological haves and have-nots. It has polarized society into two groups—those who have access to ICT and those who do not [12]. The information revolution is still a dream for many in Africa. As world becomes Internet dependent, people in developing countries they become increasingly isolated. Internet connectivity will play a major role in reducing poverty and digital divide [1].
- **Governance:** Digital connectivity will improve governance by promoting transparency. Transparency involves transparency of government operations and transparency of government-held data. It occurs through the support of society, government, and media. More transparency means improved governance and greater efficiency. Transparency increases public understanding of government. Participation entails including citizens in the democratic processes. The technologies will serve as resources for building better government policies [13].

CONCLUSION

As new technologies continue to evolve, the deployment of Internet access across Africa will continue to rise. Costs will continue to fall, especially in wireless technologies.

Although Africa's Internet economy is booming, there is a lot of work to be done. Africa has a long way to go before it can reap any broadband dividend. Good policies, including legislation, can have a positive effect on better Internet

access. Every African nation must continually reform its telecom sectors to witness growth in connectivity. They may follow the three major reform measures (managed liberalization, partial privatization and regulatory re-design) that South Africa made the telecom sector [14].

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World Internet Penetration Rates by Geographic Regions

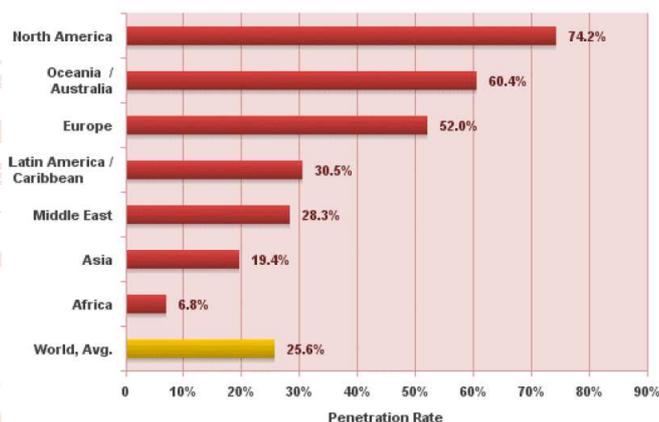


Figure1 Internet penetration [1]