

## Research

# Bridging the Digital Divide in Information Technologies: Nigeria Experience

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Information and Communications Technology (ICT) provides developing countries with a unique opportunity to compete in a global economy that is hitherto beyond their reach. ICT has the potential to reduce physical obstacles, increase market access and trade efficiency, as well as provide a competitive stimulus among these countries in a global information society. Digital divide can be described as the information technology gap between developing and developed countries. This paper outlines the challenges, opportunities and potentials in the use of ICT for education, research and development in Nigeria. It presents several initiatives that have been made by the Nigerian Government and other agencies to bridge the digital divide between Nigeria and the developed world. Challenges facing the development of ICT in the country are identified, and solution strategies to harness the full potential of ICT as an indispensable vehicle for socio-economic development in Nigeria are discussed.

**Keywords:** Digital, divide, information, communication, technology, Nigeria

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## INTRODUCTION

What is the Digital Divide? The digital divide is the gap that exists between individuals who have access to modern information and communication technology and those who lack access. There are three key stages that influence digital inequality worldwide.

Digital inequality is evident between communities living in urban areas and those living in rural settlements; between socioeconomic groups; between less economically developed countries and more economically developed countries; between the educated and uneducated population.

Individuals with access to a broadband connection can be digitally split. How? Low-performance computers, limited broadband speeds and limited access to subscription-based content widen the gap. 3 Types of

### Digital Divide Exist

There are numerous types of the digital divide that influence our efforts in accessing the internet. Some of the vivid gaps in digital inequality include:

### Gender Divide

According to a 2013 report, the internet gender gap is striking especially in developing countries. Though mobile connectivity is spreading drastically, it is not spreading equally. Women are still lagging. Men in low-income countries are 90% more likely to own a mobile phone than women. This translates to 184 million women who lack access to mobile connectivity. Even among women owning mobile phones, 1.2 billion women in low and mid-income countries have no access to the internet.

## Social Divide

Internet access creates relationships and social circles among people with shared interests. Social media platforms like Twitter and Facebook create online peer groups based on similar interests.

More than ever internet usage has influenced social stratification which is evident in societies among those that are connected to the internet and those that are not. Non-connected groups are sidelined since they don't share in the internet benefits of the connected groups.

## Universal Access Divide

Individuals living with physical disabilities are often disadvantaged when it comes to accessing the internet. They may have the necessary skills but cannot exploit the available hardware and software. Some parts of the world will remain segregated from the internet and its vast potential due to lack of digital literacy skills, low education levels, and inadequate broadband infrastructure.

## What is digital literacy?

Digital literacy means having the skills you need to live, learn, and work in a society where communication and access to information is increasingly through digital technologies like internet platforms, social media, and mobile devices.

Developing your critical thinking skills is essential when you're confronted with so much information in different formats – searching, sifting, evaluating, applying and producing information all require you to think critically.

Communication is also a key aspect of digital literacy. When communicating in virtual environments, the ability to clearly express your ideas, ask relevant questions, maintain respect, and build trust is just as important as when communicating in person.

You'll also need practical skills in using technology to access, manage, manipulate and create information in an ethical and sustainable way. It's a continual learning process because of constant new apps and updates, but your future self will thank you if you keep your digital life in order!

While most Sub-Saharan African countries have registered high and sustained economic growth over the past decade, a large number of poor and vulnerable people have remained exclusive from the benefits of this progress. A total of 389 million people across the continent still live on less than US\$1.90 a day. Social indicators have picked up only modestly, with unemployment remaining high while income inequalities have widened. With Sub-Saharan Africa's population expanding rapidly, from around 1 billion today to an estimated 2.5 billion by 2060, the continent is

experiencing a significant demographic shift posing both positive and negative prospects for development (Iwara, Adenike & Usoro, 2009). In order for Sub-Saharan Africa to leverage its demographic dividend, it is crucial to include all segments of society, including the poorest populations, into the development process. Without inclusive and transformative development, the continent's long term sustainability and socio-economic development may be at risk.

This is the Age of Empowerment (Margaret Ugboma, 2012). Empowerment of individuals and communities means increased control over life and coping skills. With and through ICT people's empowerment is quick and far-reaching. With information technology people gain new abilities and ways to participate and express themselves in a networked society. However, there is need for such mechanism to explode the myth that digital empowerment is urban-centric. Hence, there is the need to explore ways and means of digitally empowering marginalized communities living in socio-economic backwardness and information poverty. This will emphasize on simple smart technologies and skill-based activities and projects that provide an effective entry route for learners, who are disengaged with the learning process, or who are unconfident with new and high technology (Ajayi, 2003). Successful and timely implementation of these projects will enhance Nigeria's competitiveness. This envisages digital empowerment as a way towards inclusive growth in Nigeria (World Bank, 2013).

## WHY THE DIGITAL DIVIDE?

Mutula (2008) and Murelli (2002) have identified a number of factors that fuel the digital divide on the Africa continents and other developing countries including: the general poor economic conditions obtaining in most countries of sub-Saharan Africa; local content factors whereby most of the digital resources are irrelevant to the needs of Africans because they are dominated by foreign cultures and contexts; cultural and linguistic factors where digital resources are presented in foreign languages and depict foreign cultures and in addition, where the education system have also adopted foreign languages such as French and English as mediums of instruction in schools and for conducting of research; HIV/Aids, where financial resources are being diverted towards meeting the challenges of the pandemic in terms of procuring medicines and putting in place other mitigation strategies instead of investing in ICT infrastructure; telecommunications constraints which is summarized by Mutume (2005) and the ITU (2005), show that Africa has the most underdeveloped telecommunication infrastructure in the world characterized by having the lowest ICT indicators in

terms of connectivity, access to radio, television, computers and the internet. Recent studies however show a positive growth in the telecommunications sector for the continent, as Africa has now become the world's fastest growing telecoms market with an annual growth rate of 50%, an estimated 300 million people owning cell phones in 2008, and a total subscribers estimated to reach the 400 million mark by the end of 2009 (Margaret U. Ugboma, 2012). Other causes of digital divide identified by Mutula (2008) include the brain drain, where Africa's intellectual resources are constantly migrating to Western countries in search of greener pastures; education budgetary factors, where all the level of the education sector (from primary to tertiary) are underfunded and yet education is one of the pre-requisites to a sustainable adoption and application of ICTs; literacy challenges where a significant portion of the population, particularly in rural Africa is still illiterate, a situation that is incompatible with sustainable application of ICTs, institutional level of policies which have resulted in underutilization of even the little available ICT resources, research and development factors, where the low ratio of scientists on the continents, relative to other region of the world, continue to hamper research and development activities on the continent to drive the creation, absorption, adaptation and application of new knowledge and technologies such as ICTs; national ICT policies and regulatory constraints that militate against creating a conducive environment for ICTs and; political factors that result in equitable distribution of national resources and development, leading to social and political instability.

### REASONS FOR BRIDGING THE DIGITAL DIVIDE

Mutula (2008) has given the following as benefits derivable from bridging the digital divide:

- **Employment and Economic Growth:** Bridging the digital divide by the deployment of ICTs offers the potential for commercial use by local entrepreneurs which may generate employment and economic growth. The entire gamut of the ICT sector can provide better paid skilled employment
- **Promote e-governance and e-commerce:** The effective integration of ICT into the society is capable of promoting e-governance with its associated benefits of timeliness. The integration of ICT in the financial sector is a key factor for economic sustainability and improved social conditions
- **Promoting academic excellence:** Access to technology driven instructional resources offers access to a wide range of information and the effective use of the knowledge gained through such use increases improvement at all levels. Bridging the digital divide can significantly contribute to the attainment of the Millennium

Development Goals (MDGs) in Africa as observed by Okot-Uma (2002), Murelli (2002), and Chetty (2005), in the following areas.

- **Education:** The application of ICT based platforms such as e-learning, can go a long way in solving some of the problems of shortage of teachers and the physical infrastructure at all levels of the education spectrum in most Africa countries because ICTs can reach many people spread across vast geographical areas.
- **Health:** Bridging the digital divide would enhance ICT based health delivery systems. Public health campaigns and basic hygiene can be more effectively delivered and accesses by all citizens including those in rural areas.
- **Eradication of Extreme Poverty:** The provision of telephony services (both fixed and mobile) as well as internet services occasioned by bridging the digital divide would create new opportunities for employment for many households. It has been discovered that the introduction of mobile phones had led to employment opportunities as well as boost small and medium

### BRIDGING THE DIGITAL DIVIDE: NIGERIA SITUATION

The various interventions to bridge the digital divide in Nigeria can be categorized into national, institutional and development agencies' initiatives. This discourse will however, focus more at national and institutional level initiatives.

Tertiary institution, especially universities across the country are developing projects to facilitate electronic networking and access to global information infrastructure by providing internet backbone that supports students and staff. Several development agencies are investing in infrastructure development in Nigeria. For example, UNDP is funding the improvement of internet connectivity in major countries in Africa including Nigeria in a project called the internet initiative for Africa (IIA). Nigeria is also a beneficiary of the Digital partnership-an initiative of the World Bank which aims at linking systems and organizations in poor communities by way of disposing millions of computers from the developed world to developing countries (Knight, 1995).

On the other hand, the advent of GSM in Nigeria has helped to fuel internet connectivity, thereby attempting to bridge the digital divide. Many of the service providers such as MTN, Glo, Airtel, Etisalat etc. has put up satellite to cater for national telecommunications services. Some (MTN, Glo and Airtel) have even gone ahead to launch backbone network, configured to include a mix of optical fibre transmission system linking various states with high capacity terrestrial radio and satellite systems. The MTN hub in selected institutions is an e-learning centre to provide students and staff with access to affordable e-learning environment. The Glo network submarine fibre

optic cable spanning several countries is a right step towards bridging the digital divide.

At the national level, the federal government approved the National Information Technology Policy in 2001, with the establishment of the National Information Technology Development Agency (NITDA), with a view to making an IT capable country in Africa thereby bridging the digital divide.

The objectives of the policy as enunciated in the Nigerian national Policy for Information Technology (2001) includes:

- To ensure that information technology resources are readily available to promote efficient national development
- To guarantee that the country benefits maximally and contributes meaningfully by providing the global solutions to the challenges of the information age
- To empower Nigerians to participate in software and IT development
- To encourage local production and manufacture of IT components in a competitive manner
- To improve accessibility to public administration for all citizens, bringing transparency to government processes
- To establish and develop IT infrastructure and maximize its use nationwide
- To improve judiciary procedures and enhance the dispensation of justice
- To improve food production and food security
- To improve healthcare delivery systems nationwide
- To promote tourism and Nigerian arts and culture
- To enhance planning mechanism and forecasting for the development of local infrastructure
- To enhance the effectiveness of environmental monitoring and control systems
- To re-engineer and improve urban and rural development schemes
- To empower children, women and the disabled by providing special programs for the acquisition of IT skills
- To empower by the youth with IT skills and prepare them for global competitiveness
- To integrate IT into the mainstream of education and training
- To create IT awareness and ensure universal access in order to promote IT diffusion in all sectors of our national life
- To create an enabling environment and facilitate private sector (national and multi-national) investment in the IT sector
- To stimulate the private sector to become the driving force for IT creativity and enhanced productivity and competitiveness
- To encourage government and private sector joint venture allocation

- To enhance national security and law enforcement
- To endeavour to bring the defense and law enforcement agencies in line with accepted best practices in the national interest
- To promote legislation (Bill and Acts) for the protection of on-line business transactions, privacy and security.
- To establish new multi-faceted IT institutions as centres of excellence to ensure Nigeria's competitiveness in international markets.
- To develop human capital with emphasis on creating and supporting a knowledge based society.
- To create Special incentive programs (SIPs) to induce investment in the IT sector.
- To generate additional foreign exchange earnings through expanded indigenous IT products and services
- To strengthen National identity and unity
- To build mass pool of IT literate manpower using NYSC, NDE and other platforms as "train the trainer" scheme(TTT)for capacity building.
- To set up Advisory standard for education, working practice and industry.

***The following institutional strategies have been put in place to achieve the above stated objectives:***

- Establishment of a coordinated program for the development of a national Information Infrastructure (NII), State Information Infrastructure (SII) and local Information Infrastructure (LII), backbone through VSAT, fibre optic networks, high speed gateways and broad band technologies
- Providing adequate connectivity to the Global Information Infrastructure (GII)
- Addressing open standards for further liberalization and the fiscal measures including incentives to substantially improve telephone teledensity and make IT more affordable to the citizenry
- Establishing IT parks as incubating centres for the development of software applications at national, state and local government levels.

## **CHALLENGES**

The role of the government in creating an enabling environment for the ICT sector has faced considerable challenges, despite support by pan-African bodies like the UN Economic Commission for Africa (UNECA), with its National Information and Communication Infrastructure (NICI) process, and the New Economic Partnership for Africa's Development (NEPAD), with its eSchools Initiative. The National Information Technology Development Agency (NITDA), which is charged with the implementation of the Nigerian ICT policy, began to work

with UNECA on the country's NICI process in March 2000. While a draft ICT policy has been produced by NITDA, it is yet to be finalized, due to lack of consistent attention on the part of government. A Presidential Task Force on ICT Harmonization was inaugurated in August, 2006. Its job is to examine the duplication of efforts and absence of cross-sectoral convergence in the government's ICT strategies. Various sub-committees have prepared reports, but it appears that their efforts have been overtaken by an unexpected announcement in December, 2006 by the Federal Executive Council that several of the 27 government ministries have been merged, reducing the total number to 19. The merger of the ministries has also impacted negatively on the work of a team of Nigerian experts that has been drafting a strategic plan for 2005 to 2008 with support from an UNECA consultant. It was hoped that the plan would streamline the various ICT initiatives in the country. As can be seen, these all-important assignments have been derailed by the same body (government) that initiated them, due to the merger of ministries. After the merger, new ministers were appointed, most of who did not share in the visions of their predecessors. This is one of the greatest challenges to policy-making and implementation in Nigeria, usually resulting in a "back-to-square-one" situation whenever new ministers (and other top government functionaries) are appointed, or a complete change of government is affected. Another challenge facing the development of the full potential of ICT for education, research and development in Nigeria is the lack of a truly enabling environment and a sound ICT roadmap and strategies by policy makers resulting in unsustainable ICT development activities. Other challenges include:

- High running and subscription costs,
- Inadequate identification of information sources that meet the needs of users,
- Poor Quality of Service (QoS) of the Internet and Telecommunication services,
  - Regulatory issues,
- High cost of hardware,
- Ineffective management of network traffic and infrastructure.

The solution strategy for bridging the digital divide requires an aggressive human capacity-building in ICT through training, in collaboration with local and international institutions. The capacities of relevant institutions must be strengthened and research and development must be demand-driven, focusing on the provision of products to meet local needs.

## RECOMMENDATIONS

To develop and utilize the full potential of ICT in Nigeria, thereby bridging the digital divide, there is need to set up an effective ICT taskforce with representatives from all stakeholders. This, will among other things:

- Assist policy-makers in the formulation of sustainable ICT programmes-roadmap,
- Manage and coordinate the activities of the research and educational network,
- Develop innovative ideas for the efficient utilization of ICT infrastructure (e.g., distance education and virtual libraries & laboratories for teaching and research),
- Provide training in the use of new ICT-based tools, and
- Promote the use of cost-effective ICT technologies such as open source and wireless technologies.

Besides the afore-mentioned recommendations, there must be a conscious and spirited effort by the Nigerian Government to expand and stabilize power supply (which is anything, but stable), since computers and ancillary equipment depend on power (energy). It is pertinent to also recommend that a Ministry of ICT be created and headed by an ICT-professional, who has the required "know-how" to advise government on ICT issues, as well as lead the government ICT-implementation team as much as possible. This is very fundamental for a developing country like Nigeria that desires to bridge the gap and catch up with a global ICT-driven economy. Our major financial institutions currently are very willing to make huge lending to traders who import container-loads of merchandise most of which are not IT related. Such willingness should be diverted (or at least extended) to IT projects in tune with the development in the ICT sector by packaging both local and international facilities to support competent ICT companies.

Finally, Regulatory authorities like NITDA (National Information Technology Development Agency), NCC (Nigerian Communications Commission), and CPN (Computer Professionals Registration Council of Nigeria) have a crucial role to play in the development and strengthening of the ICT industry. Governments of developing countries like Nigeria should support the establishment and development of regulatory environments that provide mobile firms, investors and consumers with the confidence and trust that will facilitate ICT-enabled development and its positive implications for overall economic development.

## CONCLUSION

Information and Communications Technology has become one of the most evasive industries in modern history. It is now the driving force and catalyst for the

development of modern economies. No country can effectively participate in the new global economy without a formidable ICT base. It is this consciousness that has informed all the ICT projects and policies initiated by Nigeria, as presented in this paper. Nevertheless, these projects and policies aimed at bridging the digital divide will continue to suffer as long as there is no policy continuity (as mentioned earlier) on the part of the Nigerian Government and her functionaries. Besides, no matter how big the dream to conquer the ICT world may be, if the current epileptic power supply persists, everything will end up in the hands of a few privileged Nigerians who can afford power generators, and hence a failure to bridge the gap. The power supply issue has greatly hampered ICT training and development efforts in rural Nigeria. The Nigerian Government and People must come to the realization that ICT is highly capital-intensive, and so, the required funding must be done to the sector. They must also understand that ICT infrastructure requires continuous (preventive, corrective and adaptive) maintenance, and the needed funding must be channeled towards it. The challenges facing the full implementation of ICT for education, research and development in Nigeria notwithstanding, Nigeria still holds promise to lead Africa in ICT, with a market value projection of \$10 billion in the year 2010 (Umoru, 2008).

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