The Social Impacts of Information and Communication Technology in Nigeria

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ABSTRACT

This paper highlights the main types of information and communication technologies (ICT) used in Nigeria, the challenges of using them, and provides an indepth study of the social impacts of ICTs in Nigeria. We find that while some of these impacts are beneficial, like improvements in education, health, innovations, government service delivery, and participatory democracy; others are pervasively detrimental to the society as a whole, like e-fraud, hacking, dissemination of offensive images by foreign and local media, and job displacements leading to unemployment. Overall, we find that there is still a large scope of social benefits of ICTs yet to be explored in Nigeria.

Keywords: Information and Communication Technology, Social Impact, Innovation, E-government, Nigeria
JEL Classifications: O30, I00, O31, H11, N17

1. INTRODUCTION

Much of the current wave of globalization sweeping across the globe has been attributed to the rapid innovations in information and communication technology (ICT). Indeed, ICT has prompted remarkable changes in the Nigerian economy in the last three decades. Though the nature and direction of these spectacular changes are difficult to predict owing to the pervasive nature of ICT, it remains obvious that these ICT-induced changes will continue at least in the foreseeable future. This is because ICT has become a central part of modern life in Nigeria: We chat, text, email and tweet on cell phones; we work, teach, learn, research, shop and entertain ourselves on the internet; and we eagerly await the next innovation from the world of ICT (The Conference Board, 2011).

Wangwe (2007) views ICT as a myriad of stand-alone media such as telephone and mobile telephony, radio, television, video, tele-text, voice information systems and fax, as well as computer-mediated networks that link a personal computer to the internet. Accordingly, ICT is an integrated system that incorporates the technology and infrastructure required to store, manipulate, deliver and transmit information; the legal and economic institutions

required to regulate ICT access and usage; and the social and inter-personal structures which allow information to be shared, facilitate access to the ICT infrastructure, and through which innovation takes place. van Ark et al. (2011) defined ICT as an umbrella term that includes any communication device or application like radio, television, cellular phones, computer and network hardware and software, and satellite systems, as well as the various services and applications associated with them, such as videoconferencing and distance learning. These definitions imply that ICT can be viewed as a general purpose technology, which in the main permits people to generate, access, analyse, share and use data, information and knowledge in ways that, until recently, were almost unimaginable. Thus, the applications and impacts of ICT on the overall economy can be said to be broad and pervasive.

It is the goal of this paper to take stock of the social impacts of ICT in Nigeria. To do this, we adopt the method of extensive examination of both theoretical and empirical studies in the literature. First, we examine the ICT sector in Nigeria as to historical development and types of ICTs used. Second, we evaluate the challenges faced in using ICTs in Nigeria. Third, we conduct an indepth study of the social impacts of ICT, disaggregated into positive and negative impacts. Here, "social impact" refers to the changes ICTs bring to

the lives of economic agents and the economy as a whole. Hence, the relevant questions include, among others: What is the impact of ICT on the social sectors of the economy such as education, health, etc? What is the impact of ICT in the political system and governance such as participation in the electoral process? What is the impact of ICT on social exclusion and integration? Indeed, owing to the broad and pervasive nature and applications of ICT, the range of relevant questions in accessing the social impacts of ICT appears quite formidable.

2. MAIN ICTS USED IN NIGERIA

ICTs used in Nigeria began with the radios and telecommunications, which were essentially delivered by copper wires. These ICTs provided Nigerians with a range of social services such as rendering newscast, disseminating information, providing relaxation and entertainment. However, advances in ICTs have led to more complex ICT tools and systems that have wide applications and coverage. Some of these new ICTs include mobile phones, television, computers (PCs, laptops, IPADs, and other handheld computer devices), email, video conferencing, the internet and expert systems (Okoye, 2012). Other ICT-enabled applications widely used in Nigeria are Facebook, Twitter, Instagram, Blackberry Messenger, Skype, WhatsApp, YouTube, and a host of other mobile applications.

3. CHALLENGES FACED IN USING ICT IN NIGERIA

Several challenges hinder the use of ICTs in Nigeria. Some of these challenges have been categorized into issues relating to connectivity, capacity, capital, culture, community, commerce and cooperation (Chetley, 2006; Satellife, 2005; Rao, 2005). We consider these issues briefly in what follows. Connectivity covers a range of issues, namely: Lack of access to power supply such as electricity, solar power options and uninterrupted power supply back-ups; lack of connectivity access such as access to telephones, personal computers, and internet connectivity; lack of infrastructure such as insufficient telecommunications infrastructure and high telecommunications tariffs, high internet access costs, insufficient internet service providers, among others. Presently, Nigeria is the leading African economy by GDP. In Table 1, we show that Africa, which Nigeria constitutes a major component, is by far more challenged than the rest of the world in terms of internet access and costs.

Nigeria faces a major challenge in terms of lack of capacity by citizens to effectively use, service and maintain ICTs. Literate and skilled manpower are necessary for effective utilization of ICT facilities, especially in recent times that rapid introduction of new technologies and other innovative advancements have become the order of the day. As shown in Table 2, official statistics from UNICEF Institute of Statistics puts Nigeria's total adult literacy rate in 2008 at 51.1%, while that of Africa and the World as a whole stand at 63% and 85.2% respectively. Even with an improved figure of 59.6% in 2015, Nigeria still lags far behind the advanced regions of Europe, the Americas and Asia. This obviously underlines why

lack of capacity in terms of literacy and technical skill constitutes a major challenge for effective utilization of ICTs in Nigeria.

In Nigeria, investment in ICTs is still low relative to the highly industrialized economies. According to Chetley (2006), finding the right mix of private and public resources to enhance publicly accessible knowledge bases is a major challenge facing developing economies, Nigeria inclusive. Most public and private institutions do not have properly functioning ICTs. For example, e-learning is still far away from almost all public universities in Nigeria. Integrating technologies into healthcare services is still a "tall dream" in Nigeria. Indeed, investments in ICTs in Nigeria have thus far been characterized by fragmentation, without any collective effort towards coordination and integration for improved information sharing. Thus, there is need for a national ICT to underpin the delivery of educational, health, and other social services in Nigeria.

The culture of information sharing is one that must be encouraged in Nigeria in order to ensure effective ICT utilization. This calls for political will to update the laws regulating the operations of the telecom and broadcast sectors with a view to dismantling all the cultural barriers deterring effective ICT use in the country. This means that the communities of ICT users must be clearly established so that information sharing will be encouraged in a sustainable manner, while the communities of non-users would be encouraged and assisted to come on board. Indeed, improving the skills of non-users and mobilizing the skills of the communities of users towards an integrated ICT program is a sure way to achieving an internet-based economy in Nigeria, which promotes e-commerce, e-learning, e-healthcare, among others. Above all, the effective use of ICTs in Nigeria requires the full cooperation of all stakeholders, both domestic and international, since no one country can deal with all the complexities involved. Citizens, governments, and international agencies must necessarily work together to provide the expertise and funding needed for effective ICTs utilization in Nigeria.

4. POSITIVE SOCIAL IMPACTS OF ICTS IN NIGERIA

Following Hanna (2011), we present the positive social impacts of ICTs in Nigeria with emphasis on those that improve governance, public institutions, socio-economic inclusion and the overall social welfare.

4.1. Impact on Government Services and Participatory Democracy

According to UNCTAD (2011), ICTs can facilitate democratic processes and increase participation by citizens as a result of greater communication and information dissemination offered through the use of social networking sites, e-mail and mobile phones. Particularly, e-government can improve democratic processes and encourage citizen participation in decision-making. Clearly, ICTs are decentralizing power over information, changing the institutions of governance, engendering participatory democracy and citizen feedback, fostering communities of highly empowered citizens, and new roles for government underpinned

Table 1: Connectivity access 2013

Countries	Internet users per 100 persons	Percentage of households with internet access	Percentage penetration of mobile broadband subscriptions	Price of prepaid computer-based mobile broadband (1 GB) in % of GNI per capita
Asia and Pacific	32	33	22	12.6
The Americas	61	61	48	11.1
Europe	75	77	68	1.9
Africa	16	7	11	58.3

Source: International Telecommunication Union (Available at: https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures 2013-e.pdf)

Table 2: Total adult literacy rate 2008

Countries	Asia	North America	South America	Europe	Africa	World	Nigeria	Nigeria*
% Literacy rate	84.3	96.1	93.3	99.3	63.0	85.2	51.1	59.6

Source: UNICEF Institute of Statistics, UIS (Available at: http://data.uis.unesco.org/Index.aspx?DataSetCode=EDULIT_DS&popupcustomise=true&lang=en#; Accessed: November 19, 2015). *2015 figure based on UIS estimation

by transparency and accountability (Beardsley et al, 2010). In Nigeria, the internet is promoting more transparency in governance as citizens can now obtain more public information via this tool. Even though citizens still go through 'hell' to obtain some public information under the Freedom of Information Act, it is expected that public officials will soon move away from this practice and proactively start putting public information online and granting citizens access to government databases. ICTs have made it possible for Nigerians to monitor and scrutinize the political process and other government activities, and more importantly, to fight corruption. The recent adoption of Treasury Single Account by the Federal Government of Nigeria, the use of card readers and permanent voters' card, the compulsory bank verification number for all account holders, and the compulsory registration of all mobile phone numbers are major ICT-driven steps in the fight against corruption and terrorism. Indeed, all government institutions in Nigeria are expected to embrace ICT-driven web-based frameworks. This will further promote citizens' participation in governance through policy debates, promote democracy and the rule of law, enhance the quality of representations in the legislature, encourage more dialogue with the governed through e-governance, and subject government revenues, expenditures, policies and administrative processes to public tracking and monitoring. Overall, going forward, e-government, which is the use of ICTs in the provision of government services are the way to go so that Nigerians are able to access such services easily and faster and in a more user friendly manner.

4.2. Impacts on Education and Health

Globalization and the ICT revolution have indeed impacted significantly on the education and health systems in Nigeria. In the case of education, the way Nigerians study has witnessed a lot of changes. Learning is fast moving away from the traditional textbook-based system to a lifelong learning system through networks of academic, local and global communities facilitated by digital communication, social networking, and collaborative technologies. Indeed, ICTs are transforming how and what people learn in Nigeria. Nigerians now freely have access to a wide range of data and information on the internet such that terms like e-library, e-learning, e-book, and their likes have become common knowledge in modern Nigeria. Research outputs are easily disseminated around the globe by means of the internet too.

Overall, the impacts of ICTs in the education sector in Nigeria are better seen in the facts that the distance between school and home is disappearing while borderless educational systems are emerging. In addition, richer learning environments, increasing exchange schemes, and online and/or virtual institutions are also emerging, leaving students and teachers as companions in their quest for just-in-time knowledge. However, going forward and in line with global best practice, it will be wonderful to see greater partnerships between Nigeria and the international community through such institutions like Microsoft, Cisco, IBM and other members of the international academic community towards enabling the equipment, computer labs and broadband internet facilities to drive teaching and learning in Nigeria.

According to ITU (2010), e-health ICT applications include electronic health records, telemedicine, m-health (the use of mobile devices such as mobile phones for health purposes), decision-support systems, e-learning and e-journals, complex and networked medical equipment. In the Nigerian health sector, the ICTs revolution have affected the areas of health education and training, diagnostics, medical records and information management, patient administration, and indeed, almost all aspects of healthcare policy, research, and delivery. However, the impacts of ICTs in this sector cannot be called pervasive as there still large scopes for transformation. ICTs have made it possible for rural health workers in Nigeria to receive and transmit information about disease outbreaks, their prevention and early treatment. Healthcare delivery in Nigeria is gradually moving towards ICT-driven mobile point-of-care devices equipped with specialized software applications for diagnostic and treatment support for diseases. Most hospitals in Nigeria are increasingly moving towards electronic documentation of patient information, while SMS are currently used to authenticate the genuineness of drugs. Furthermore, ICTs-driven strategies are breaking the barriers of distance, poverty and scarce resources that hitherto impeded access to healthcare services in rural Nigeria. Clearly, the impact of ICT in the effective management of the last Ebola experience in Nigeria cannot be over stressed. Going forward, an ICT-centric national health plan is needed in Nigeria so that patients can view their medical profiles online, renew their prescriptions, make appointments with medical officers, and enroll into the National Health Insurance Scheme, and so on.

4.3. The Fight Against Poverty

ICT-enabled solutions have become veritable tools for fighting poverty in Nigeria. As a sector, ICT has created employment opportunities for millions of Nigerians, especially those involved in recharge card printing and sales, as well as sales and maintenance of ICT-based equipment, thereby improving incomes for the poor and vulnerable. For peasant farmers and traders, ICTs have improved their access to information and markets. For example, the ICT-based fertilizer distribution system under the Transformation Agenda of the Jonathan Administration greatly ensured that the fertilizers reached the farmers at government subsidized rates. Indeed, the benefits of electronic interactions between the government and the governed cannot be over emphasized, especially as it relates to the fight against poverty and corruption. ICT-based systems, particularly radio and television, are being used to educate the poor and rural dwellers about government poverty reduction programs. Mobile-friendly banking products and other investment avenues are available in Nigeria today, aimed at the poorest depositors. For instance, Electronic wallets with various financial transaction applications at reduced costs are now present in the Nigerian market. Going forward, it should be expected that governments at all levels in Nigeria will develop sustainable and affordable institutional frameworks, mechanisms and platforms for poverty reduction through a coordinated and innovative applications of ICTs, whose role in poverty alleviation has been well acknowledged by FAO (2005).

4.4. Enhanced Communications, Interactions and Information Access

ICTs provide the means of connecting the government with the people so that they are better empowered to demand improved service delivery. Indeed, presently in Nigeria, the networking infrastructures provided by ICTs enables Nigerians (rich and poor alike) to participate in development, obtain timely information about markets and buyers, share information globally about experiences and innovations, network with domestic and international investors, and mobilize against poverty and corruption, thereby ensuring grassroots participation in governance and inclusive information society. Increasing awareness of Nigerians about global best practices and standards cannot happen without ICTs. Going forward, it is expected that increased use of ICTs will promote small scale businesses and their interactions with the public sector through integrated financial systems and other ICT-based solutions. This will improve the business environment, promote transparency and government responsiveness to citizens and businesses; enhance the competitiveness of the private sector; decrease brain drain of knowledge workers and promote economic and social development of the country. The benefits of improved communications and interactions among the people, which are facilitated by the use of ICTs are indeed enormous.

ICTs have dramatically changed the way Nigerians interact among themselves, particularly through the use of social networking media, online blogs, and their likes. Today, some Nigerians are finding jobs and lifelong partners through these social networking media. Some employers are also using these media to reach out to prospective employees. The social networking sites also being used by politicians to enhance their interactions with the people.

In the build up to the 2015 general elections in Nigeria, politicians increased their presence on Facebook, Twitter, Instagram, etc. These platforms provided them with not only the avenues to sell their programs to the electorates but also the means of criticizing the government in power. Blogs like Naira Land and Naij.com were equally very active as Nigerians continuously engage themselves in debating the issues of governance and national development. These facts indicate that ICTs have indeed changed and enhanced the way Nigerians interact and communicate among themselves.

4.5. Innovation

According the Oslo manual (OECD and Eurostat, 2005), innovation can be defined as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations." It can occur in all sectors of an economy, certainly public and private sectors. The application of ICTs to research, learning, commerce, design, services, logistics, banking, finance, marketing, and transportation has enabled economic agents to become more efficient, flexible, and innovative. Much of the strategies used by entrepreneurs to undercut competition in Nigeria today are enabled and made effective through the innovative applications of ICTs and their knowledge-centric management tools towards the creation of new products, services and business models. Consider, for instance, academics whose primary functions revolve around teaching and research. By transforming the way researchers conduct their research, communicate with other researchers and potential users of research outputs, and instantly access relevant data and knowledge from vast and growing global sources, ICTs have become for them a tool for magnifying brainpower and for innovation. Research and innovation in Nigeria have become increasingly global, multidisciplinary, collaborative and open. Going forward, it is expected that governments and organizations in Nigeria will tap deeper into the use of ICTs to improve service delivery, enhance collaborative and grassroots-based innovations, harness knowledge from the global economy, encourage and enrich consumer-producer relationships and conventions, and enable the creation of new communities of ICT-based innovators.

4.6. Emergence of Modern Organizations

The ICT revolution together with the forces of globalization and competition are underpinning the emergence of modern business organizations that are lean, globally interconnected, responsive and quality-driven. These transformative impacts have intensified in the last decade following the advances in mobile, broadband, and collaborative technologies. These organizational revolutions are also fast diffusing beyond businesses to public and civil society organizations. Network-centric virtual business organizations are fast gaining roots in the economy, driven by real-time ICT applications and synchronizing the needs of customers, producers, and other stakeholders within a dynamic "sense and respond" system. The work place is also changing from the traditional hierarchical structure to a flatter and more integrated structure characterized by team work, job rotation and fast access to all information by everyone. There is greater drive towards a less paper-based organization, where most organizational activities are performed online via emails, teleconference, among others.

The traditional filing cabinets are increasingly giving way to large amounts of data and information stored in laptops and other disk and USB-based external drives.

4.7. Emergence of Social Entrepreneurs

The ICTs revolution has led to the emergence of social entrepreneurs in Nigeria across various fields such as education, health, communication, entertainment, etc. Presently, there are numerous bloggers providing the platforms for citizens to debate and participation in policy and development decision making; there are online tutors and examiners formulating and implementing ICT-centric curricula; there are talented entertainers develop and selling drama sketches and games; there are software developers creating applications for monitoring and disseminating information about prices across the economy; among others. Obviously, ICT tools provide the needed tonic for the entrepreneurial spirit of the people to blossom, thus culminating in the emergence of a mass of social entrepreneurs in Nigeria. Overall, ICT is creating a huge social impact by sparking increasing opportunities for Nigerians to express themselves as social entrepreneurs.

4.8. Impacts on Employment

According to UNCTAD (2011), ICTs have roles in the creation of employment and self-employment. They enhance individual's employment opportunities, and their impacts can be direct through the growth of the ICT sector and ICT-centric industries, or indirect through multiplier effects. Telecommunication services offer one of the greatest opportunities for employment creation in most developing economies, particularly Nigeria (UNCTAD, 2010). In fact, Pyramid Research (2010) identified the positive impacts of the growing mobile telephony industry in Nigeria to include growth in the industry itself and associated industries, creation of direct and indirect employment, and development of labour force skills. Apart from creating employment opportunities, a major social impact of ICTs in Nigeria is seen in the changing nature of employment opportunities available to individuals as well as the level and kind of skills required to seize such opportunities. In both the manufacturing and service sectors, employers increasingly emphasize the requirement of computer literacy as precondition for employment. To say the least, this underscores the key role that ICT plays in modern-day Nigeria.

4.9. Social Integration, Peace and Security

ICTs applications have provided the means for increased social interactions and inclusion among the Nigerians. For instance, the advent of mobile phones, computers and internet facilities substantially increased the level of communication among the people. The possibilities created by these ICT applications for bridge building, peace building and conflict resolution cannot be over stressed. These ICT applications provide the needed avenues for Nigerians to converse, solve problems, share experiences, voice out opinions and appreciate the richness of their diversity. These contribute in no small measure towards ensuring a peaceful Nigeria. Similarly, ICT applications have been greatly deployed in recent times towards the battle against terrorism and other crimes in Nigeria. Mobile phones provide the fastest means through which citizens contact the security agencies in times of distress. The ongoing bank verification number is also a means of tracking terror funds in the financial system. Clearly, these innovations wouldn't

have been possible without the advances offered by ICTs. Besides, the social media has recently emerged as a veritable medium for the promotion of human rights, particularly freedom of expression and information, promotion of access to knowledge, revealing of human rights abuses and promotion of transparent governance. The social media also promotes mutual understanding among the people. These are clear indications that the impact of ICT applications in social inclusion, peaceful coexistence and conflict resolution is far reaching.

4.10. Political Activism

Several ICT-based platforms offer Nigerians the media through which they express their political views towards ensuring a well functioning political system in the country. The role of social networks like Facebook and Twitter in the propagation of social protests in modern day Nigeria cannot be over emphasized. For example, these social media-based tools were used to mobilize Nigerians to protest against the increase in the pump price of petrol in January 2012. The protest was so massive that the government was forced to reconsider its earlier policy pronouncements. When a state governor told a petty trader to "go and die," the power of the social media also manifested as the people resoundingly demanded and obtained his apology. These are few examples of the impact of ICT applications in the realm of political activism.

5. NEGATIVE IMPACTS OF ICTS IN NIGERIA

ICTs also pose some dangers to Nigerians owing to their negative social impacts. We summarize some of these unwanted effects in what follows. There are a number of adverse impacts of ICT on the privacy and security of individuals and organizations. These include commercial losses from denial of service, hacking attacks, data loss through theft or corruption and disclosure of confidential data (UNCTAD, 2011). According to OECD (2008), these challenges that are prevalent in Nigeria can affect societies and economies, as well as individual businesses. Individuals, firms and banks in Nigeria lose billions of naira to e-fraud annually. According to Nwokpoku (2015), Nigerian banks lost N199 billion to e-fraud between 2000 and 2014. ICTs can also have negative effects on health. For instance, occupational overuse injuries arising from computer use and adverse health impacts emanating from improper disposal or recycling of e-waste are ICT-induced challenges facing Nigeria presently. Some Nigerians have suffered redundancies, displacements and unemployment arising from increased computer usage by economic agents. For instance, the preference for expert systems like robots in some industries, like the automobile manufacturing industry, have caused many unskilled and routine labour forces, like spray painters and welders, to be relieved of their jobs.

According to Chaozhu (1993), television broadcasts, CD-ROMs and video cassettes from some foreign countries convey images of war, disasters, famine, kidnapping, armed robbery, drug abuse and drug trafficking, pornography and prostitution, and unbridled use of short guns even by the underage. Many citizens of Nigeria have become addicted to these vices with their resultant adverse impacts on the society as a whole. Indeed, misinformation and

cultural adulteration have been identified by Omekwu (2003) as part of the pervasive and destructive effects of ICT-centric society, particularly Nigeria. The patterns discussed here summarize the pervasive negative social impacts of ICTs in Nigeria.

6. CONCLUSION AND RECOMMENDATIONS

In broad terms, this study examined the social impacts of ICTs in Nigeria. Three specific objectives were achieved. First, we examined the ICT sector in Nigeria as to historical development and types of ICTs used. Second, we evaluated the challenges faced in using ICTs in Nigeria. Third, we conducted an indepth study of the social impacts of ICT, disaggregated into positive and negative impacts. The study undertook an extensive analysis of both theoretical and empirical literature.

We summarize the findings as follows. On the one hand, some of the social impacts of ICTs in Nigeria are beneficial, like improvements in education, health, innovations, government service delivery, participation democracy, fight against corruption and poverty, enhanced communications, interactions and information access, increase in employment opportunities, emergence of modern organizations, among others. On the other hand, some of the social impacts of ICTs are pervasively detrimental to the society as a whole, like e-fraud, hacking, dissemination of offensive images by foreign and local media, job displacements leading to unemployment, and so on.

Overall, we find that there is still a large scope of social benefits of ICTs yet to be explored in Nigeria, such as full implementation of e-government; greater partnerships between Nigeria and the international community for deeper use of ICT applications in teaching and learning; full implementation of an ICT-centric national health plan, among others. These findings suggest that makers and executors of public policies across the various social sectors in Nigeria should explore deeper into the untapped social benefits of ICTs in order to enhance the nation's overall social welfare.

7. ACKNOWLEDGMENT

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