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TOWARDS AN AFRICAN INFORMATION SOCIETY IN THE DIGITAL AGE: PROSPECTS AND CHALLENGES

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ABSTRACT

In this day and age, information communications technology, also known as ICTs, is crucial to a nation's or even an entire continent's human and socioeconomic development. Unfortunately, many in the developing world, especially in Africa, are left behind technologically. This paper will explore the theme of digital divide, with a focus on Africa. As the success of a country's information society is inextricably linked with its public policy and general economic conditions, the paper will examine the major challenges to Africa's full technological development. At the same time, it will also present Africa's overall progress in the ICT domain with cases studies from Tanzania, Kenya, Uganda, and South Africa. Finally, it concludes with several recommended strategies to make a vibrant African information society possible in the near future.

INTRODUCTION

Information and Communications Technologies, also known as ICTs, are not only deeply connected with our everyday lives; on a larger scale, they are also the driving force behind globalization. The emergence of the digital age since the mid-nineties have created enormous opportunities and changed the lives of many across the globe. However, it has also further marginalized those who were already at the brinks of the international political economy. In particular, the African continent has been and still is the region that is the most left behind in the field of information technology. Hence, the two key questions facing Africa are: how to make ICT access available for all on the continent, and what type of technologies are suitable for Africa? Despite being at the periphery of technological development, however, various initiatives and projects advancing IT progress have taken and are taking place throughout the African continent. The main objectives of this paper are: to highlight Africa's ICT achievements within the last decade and to dispel the negative mainstream media portrayals about the lack of technology in Africa by looking at the prospects of an African information society coming into forming within the next two to three decades.

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This paper is divided into seven sections. The first provides an overview of the global digital divide while the second talks about the significance of information technology on Africa's socioeconomic development. The third is about the current state of ICTs in Africa, and the fourth examines the major obstacles to technological development on the African continent. The fifth looks at the cases of IT application and progress in Africa while the sixth discusses about the prospects of an African information society coming into being. Finally, the paper concludes with recommendations that would make a continental-wide information society possible in the near future.

Overview of the Global Digital Divide

What are Information and Communications Technologies? In general, ICTs encompass a wide range of products and services. They include but are not limited to: the Internet, mobile phones, satellite transmission, digital devices, or GPS navigating systems installed and used in vehicles (Nulens *et al*. 2001:9). Additionally, they also embody components such as hardware (highways, cables etc.) and software (financial systems) infrastructures that make their applications and utilizations possible (Powell 2001: 248). Information technology has changed the lives of millions worldwide by making communications, travel, and information access

cheaper and faster as well as created a handful of successful high-tech entrepreneurs in places like the Silicon Valley. Nonetheless, like everything else, technology also has its downsides; one of which is the global digital divide that is deepening the disparities between the industrialized and the developing nations. A general definition of the global digital divide is unequal access to ICTs within and between nations. Lamentably, the rise of information technologies has not brought about the expected economic, political, and social improvements in the developing world as some had anticipated because digital divide is not merely caused by the lack of technological distribution in the developing world. Rather, this divide is part and parcel of the already existing disparities among nation-states. In the African context, the technological divide goes hand in hand with the problems of underdevelopment as the majority of African countries do not have the necessary infrastructure nor skilled workers to facilitate the use of ICTs on the continent (Ya'u 2004: 12 and 24).

Additionally, the problem of the global digital divide has also raised the question of who controls the production and dissemination of technology and its networks. Overall, the industrialized world controls and develops technology as major tech companies are located in North America (US and Canada), the European Union, and the Pacific Rim (Japan, South Korea, and Singapore etc.) while the developing one is the consumer of technological products and services. When the Internet first came into being and became widely used in the industrialized world, there was a widespread assumption that the new information technology would empower everyone around the globe (Ibid 2004: 16; Guillen and Suarez 2005: 681). But, this has not turned out to be the case because countries with an initial advantage in the creation, organization, and dissemination of information and knowledge already have an edge over those who are technologically disadvantaged. Moreover, the international division of labor in which ICT research and development take place in the developed world while the developing one is confined to being providers of raw materials and IT consumers is further reinforced by the World Trade Organization's (WTO) Trade-Related Aspects of Intellectual Property Rights (TRIPs) agreement. Thus, instead of enfranchising and empowering those residing in the developing world, the Internet technology has disenfranchised them (Ibid 2004: 17; Ibid 2005: 681 and 697).

Significance of ICTs

On a larger scale, information and communications technologies are an indispensable part of a country's and even an entire region's socioeconomic and human development because technology provides access to information, which in turn leads to knowledge, and knowledge is a prerequisite for development. Therefore, ICTs are viewed as a major potential factor that could facilitate and jump start Africa's development; and due to its importance, technology has now become a pertinent topic of the mainstream discourse on international development, especially with regards to Africa (Nulens *et al.* 2001: 9). In terms of improving a country's living standards and augmenting its overall level of development, information technology has the following

economic, political, and social significance. Economically, access to technology is vital for a nation's integration in the "knowledge" economy, which characterizes the current era of globalization, since all major business and financial transactions take place online; for example, stock exchanges, e-commerce, remittances, and diffusion of news information etc. In addition, a nation's ability to fully participate in the WTO's General Agreement on Trade in Services, also known as GATs, is dependent upon its levels of IT connectivity and infrastructure since a country that is technologically poor cannot offer services like online education, stock exchange on the financial market or global broadband services. Sadly, due to its low levels of Internet connectivity, the African continent as a whole is excluded from important WTO trade agreements (Ya'u 2004: 14). Politically, ICTs have enormous potentials for improving governance and for increasing grassroots political participation because having widespread access to a variety of information will in turn produce a well-informed population that would constitute the pillar of a strong civil society, which is indispensable in sustaining a nation's democracy and sociopolitical stability. On the other hand, the paucity of civic knowledge along with the lack of access to information have led to voter apathy and little or no mass political participation in a country's electoral process, which was the case in Kenya during its 1992 elections as massive electoral fraud and irregularities had occurred (Nulens *et al.* 2001: 68; Rathgeber and Adera 2000: 215).

Besides consolidating democracy and social stability, information technology has also created open channels for African citizens, including those living abroad, to openly express their political views. In addition, it has increased the possibilities for African governments to reach their rural populations and provide them with services available to urban residents. Furthermore, ICTs are powerful tools for advancing the goal of African Unity as they facilitates communication, networking, and cooperation among all African states on resolving problems and implementing major projects (Ibid 2001: 68; Powell 2001: 249). Socially, having easy access to technology is a fundamental human right in this day and age because a society's ability to effectively function on a daily basis depends upon available widespread access to accurate and most up to date information. According to the People's Communication Charter that was formulated from the 1995 World Conference on Women in Beijing, China: People have a right to universal access to and equitable use of cyberspace. With the increasing importance of cyberspace for many social activities, people's rights to free and open communities in cyberspace, their freedom of electronic expression, and the protection of their privacy against electronic surveillance and intrusion should be secured (Rathgeber and Adera 2000: 197). Hence, the freedom of IT access is not only important in its own right; they are also vital for a nation's economic, political, and social well-being as it goes hand in hand with everyone having equal and unlimited access to multifarious forms of information and communications channels (Ibid 2000: 197-198).

Current State of Technology in Africa

Sadly, Africa has been labeled as the most 'unconnected' continent in the world due to its marginalization in the technological arena. One of the major dilemmas facing the

continent is that it is too poorly positioned in cyberspace to reap the benefits of globalization. Although the African continent comprises about 13% of the world's population, it only accounts for around 0.22% of the global telephone landline connections and less than two percent of personal computer (PC) ownership worldwide. Overall, the world average for telephone landlines is about 15.36 lines per one hundred people while Africa's is approximately 2.55 lines per hundred. In terms of Internet hosts, the global average is 236.66 per 10,000 people while Africa's is only 84.71 hosts per 10,000 (Ya'u 2004: 11 and 14-15). Additionally, it is estimated that Sub-Saharan Africa as a whole only has one Internet user in every 250 to 400 people compared to an international average of one user per every fifteen people. Unfortunately, thus far, Africa accounts for almost zero percent of worldwide production in technology, and its general technological applications and utilizations are equally low as well. The African continent also ranks last with regards to per capita spending on technology. Other than a few hardware assembly plants and some local software production, the continent imports all of its ICT equipments and supplies. For now, the only African nation with the most widespread technology use and access is South Africa. Even then, this country is the consumer of technology exported from the industrialized world (Ibid 2004: 16-17).

The current state of technology in Africa also brings into focus the mainstream international discourse on the role of ICTs in promoting socioeconomic development, which tends to view technology as panaceas that could solve all of Africa's major socioeconomic and human development problems like: difficulties of tax collection, poor health care services, lack of law enforcement, inadequate educational facilities, and urban-rural disparities. So far, the problem of poverty is perceived as a result of the continent not fully participating in the international political economy rather than as an effect of being excluded from the global knowledge economy. Therefore, some scholars on technology and development have pointed out that merely having technology will not solve the structural problems underlying the continent's dire poverty and technological marginalization. They argue that technological assistance and development plans for Africa must contain strategies to fully include all Africans in the global information society (Mercer 2006: 243 and 251).

Obstacles to ICT Development

Besides having to import technology from abroad, the key obstacle to Africa's technological development is not the lack of technology; instead, it is obsolete policies and regulatory frameworks. Therefore, the real challenge facing the continent is organizational and political rather than technical or financial (Nulens *et al*. 2001: 318). In addition to policy problems, in general, there are four major barriers to IT development in Africa. The first is infrastructural. In order for computers and various forms of telecommunications networks to function properly, electricity and access to some type of telephone networks are necessary. Lamentably, reliable supplies of electricity at a constant voltage are still a major problem in many parts of the African continent (Powell 2001: 248). Moreover, having hardware and other necessary technical equipments alone will not make information technology work as software components such as well-established banking,

financial, and postal systems are also indispensable. The lack of banking and credit card facilities for the majority of the African population and in many parts of the developing world makes online business and financial transactions difficult because the options of wire transfers and online credit card payments are not available oftentimes. On top of this, it is all too common for people to order online items that had never arrived (Mercer 2006: 246). The second major obstacle is economic. Unfortunately, in this day and age, PC and Internet use remains beyond reach for many Africans as Internet costs are much higher in Africa than elsewhere. The annual Internet connection costs in Africa is 20% of Gross Domestic Product (GDP) per capita compared with the world average of 9% and 1% for high income countries. For instance, according to the survey conducted by Global Network Readiness in 2002; in Sweden, the annual cost of Internet use per twenty hours was 0.12% of GDP per capita while it was 5.26% for South Africa, which has the most reasonable tariff on the African continent. It was around 51.53% for Zimbabwe and 55.13% for Nigeria (Ya'u 2004: 16).

In addition to high costs, another problem is that computer skills are not required nor are they usually in demand in local economies throughout Africa. In general, Internet access and basic computer literacy are not necessary for people who work in the "second" or informal economy like petty trading, housing-cleaning, or street vending (Mercer 2006: 251). Most of all, Africa's heavy debt burden has hampered the construction of adequate technological infrastructures and networks throughout the continent (Ya'u 2004: 26). The third is educational. Generally, computer use and IT applications require a certain level of functional literacy. Hence, basic literacy is a vital indicator of a nation's technological potentials and capacities. Additionally, a country's abilities to adopt and deploy information and communications technologies are dependent upon having a sufficient supply of educated and skilled human resources. Lamentably, Africa's average literacy rate is about 55% compared with 80 to 90 percent in the industrialized nations. Thus, Internet access in Africa is limited to those who have a certain level of education and income (Ibid 2004: 15).

For those who had little or no formal education at all, language is also one of the key factors limiting their Internet access since most of the information online are predominately in English or in other non-African languages like French, German or Japanese. Even if they have Internet access, they will not be able to comprehend the information presented (Rathgeber and Adera 2000: 193). Furthermore, compared with the Organization for Economic Co-operation and Development (OECD) countries that spend an average of approximately two percent of their GDPs on technological research and development, Africa as a whole only spends around 0.2% of its annual GDP in this area (Ya'u 2004: 15-16). Besides high illiteracy rates, the brain drain of skilled African technical professionals to the developed world is also a major problem. Each year, thousands of African scientists and technical workers leave the continent for higher paying jobs and better working environments abroad (Nulens *et al*. 2001: 11). Moreover, the industrialized nations have been actively recruiting the best and the most experienced technical professionals from Africa and from other developing nations. At the same time, they are outsourcing non-skilled IT jobs and

locating environmentally degrading production outlets to the developing world. As of 1999, more than 30,000 African Ph.D. holders were living and working outside of the continent. Africa's brain drain will further widen the global digital divide as technological research and production will continue to take place in the industrialized North (Ya'u 2004: 21). Lastly, the innumerable civil strife and political instabilities throughout Africa since independence has severely set back its ICT developments because stable and supportive institutions are not able to develop and flourish in the midst of sociopolitical instabilities. Also, national governments could not devote sufficient energy, resources or time to promote technological progress if they have deal with issues of conflict resolution (Nulens *et al.* 2001:11).

Case Studies of Technological Development and Progress in Africa

In spite of being at the bottom of the IT ladder, developments and progress in technology are taking place throughout the African continent. In Tanzania, the government has launched the country's first pilot rural telecenter in March of 2003 under the auspices of the International Development Research Center, the International Telecommunications Union, and the United Nations Educational, Scientific and Cultural Organization (UNESCO). This telecenter is known as a Multipurpose Community Telecenter (MCTs). It is located in a rural town named Sengerema (Mercer 2006: 244-245). In general, telecenters have the dual function of supporting both community and commercial developments by attracting businesses to help rural communities in its use of information technologies to generate additional employments and alternative incomes. In particular, MCTs are structures which enable specific communities to manage their own developments by providing them with access to appropriate information, facilities, resources, training, and services (Nulens *et al.* 2001: 239 and 242).

The MCT project in Sengerema is a deliberate intervention by the Tanzanian government to link the country's rural communities with external markets and to expand their access to online information as Internet access in Tanzania is pretty much an urban phenomenon since the majority of Internet users are concentrated in the capital city: Dar es Salaam. One of the main assumptions underlying this project is that entire communities would benefit from Internet access, and that these rural communities, once online, will come across something that could be meaningfully identified as 'information for development' (Mercer 2006: 245-246). When Sengerema's Multipurpose Community Telecenter first came into being, it had six personal computers connected to the Internet, which offered browsing, secretarial, and printing services. Over time, Sengerema's MCT has become a symbol of urbanization led by Internet access. After the Internet had become available, Sengerema grew from a small rural district headquarter into a medium-sized town filled with modern facilities such as new buildings, electricity, running water, and taxis due to population and housing increases. Additionally, the telecenter has provided basic computer education to many people. Based on the success of this MCT, the Tanzanian government plans to establish more rural Multipurpose Community Telecenters across the country (Ibid 2006: 249).

In Kenya, the Women and Governance Project has developed advocacy materials to demystify information technology for rural women. The project has also educated rural Kenyan women about the necessities of accessing technology to effectively participate in electoral politics as well as to better manage their daily affairs. Additionally, this project has trained rural women to use computers, e-mail, and the Internet for the following purposes. The first is to help sustain the project by providing training, communication, and duplication services to others for a fee. The second is to prepare training materials like posters as well as store, transfer, and retrieve information relating to their lifelong learning activities in education, health, business, farming, and elections. The third is to conduct personal businesses such as looking for employment and for markets to sell their products, and the fourth is to form networks with other women's organizations in the country via information technology to improve female political participation (Rathgeber and Adera 2000: 234).

Meanwhile in Uganda, the Forum for Women in Democracy (FOWODE) has used the Internet to procure critical and relevant information for the female Members of Parliament (MPs) in order to assist them in parliamentary debates and in conducting further research on new bills introduced to the parliament. Through Internet and e-mail resources as well as various discussion and news groups, FOWODE could link with other organizations throughout the country to discuss and inform the female MPs regarding critical national, regional, and local issues affecting Uganda (Ibid 2000: 194-195). In South Africa, a grassroots organization named the Community of Living Water was formed to support the women's organic gardening project in the Western Cape region. To support the project, this organization used information technology in two ways: to deliver information on organic-gardening techniques and resources as well as teach English language skills via CD-ROM. In particular, the Community of Living Water has used two websites: one maintained by Ohio University and the other named Time-Life's electronic encyclopedia of gardening.

These two websites have allowed women to develop reading skills in English with CD-ROMs and then supplemented them with educational information for adults on the Internet. This in turn has sparked a community-wide initiative to donate used clothing to finance women's enrollment in additional adult education courses on SANGONET, which is the local web network (Ibid 2000: 196). The examples of the women's organizations and projects mentioned above demonstrate that information and communications technology has tremendous potentials to further African women's economic and political advancements. Affordable computer communications media like e-mail, the Internet, hypertext, and hypermedia have made it easier to network, research, train as well as exchange ideas and information. Moreover, electronic solidarity campaigns have been launched throughout Africa to advance women's rights. So far, the e-mail has been an effective tool for grassroots mobilization and for influencing public opinion. Throughout the African continent, female Members of Parliament in different countries and regions have used e-mail and the Internet to network with each other (Ibid 2000: 196).

Prospects for an African Information Society

To further promote ICT development throughout the continent, the African Ministers of Economic and Social Development formulated and adopted the African Information Society Initiative, also known as AISI, during the Conference of African Ministers in May 1996. Even though Africa is the continent that is most left behind technologically, African ministers were the first out of all developing regions to adopt a continental-wide framework and plan on technological development. Besides delineating a framework for building Africa's information and communications infrastructures, the African Information Society Initiative also envisions that the continent should build an information society in which every man, woman, child, village, public and private sector office will have secure access to online information through the use of computers and communications media by 2010. Its objective is to provide every African person with the possibilities of using the communication and data processing services available in other parts of the world. It also emphasizes on addressing the specific needs of all African citizens and the realities of their living environments (Nulens *et al.* 2001: 56-57 and 317).

Furthermore, all AISI activities are guided by three main concerns: the development of national strategies through the institution of national information and communications infrastructure plans, the identification of sectoral applications that will focus on projects to be implemented in both short and medium terms, and the institution of appropriate, integrating, pro-active, and innovative partnership schemes that will help expedite the implementation of national, sub-regional, and regional action plans (Ibid 2001: 72). In addition to AISI, the African Union has also established the e-Africa Commission, which is responsible for the New Partnership for Africa's Development (NEPAD's) ICT programs (Mercer 2006: 243). Besides initiatives from within Africa, various international agencies and organizations along with external donors have launched programs like the World Summit on the Information Society, the World Bank's Knowledge for Development, and the United Nations Development Program's Making Technologies Work for Development to enhance technological progress throughout the continent. Between 1995 and 1998, the World Bank, the European Union, and the African Development Bank along with both the Japanese and the Kuwaiti governments have spent 250 million US dollars on restructuring Tanzania's telecommunications system (Ibid 2006: 243-244). In February of 2002, both the International Finance Corporation (IFC) and the French Development Agency provided a sum of 45 million US dollars for the Cameroonian network, which complemented this country's existing 450,000 telephone lines as well as upgraded its digital cellular networks (Ngwainmbi 2005:301).

Although Africa still has a long way to go in order to reach the same technological level as the OECD nations, it has made tremendous progress in technology within the last decade. When AISI first came into being in 1996, there were only five African countries that had full Internet connections. By 2001, the numbers had increased to fifty-two countries even though Internet connections were only available in the capital cities. In January of 2001, Africa only had around 3.11 million Internet users, which was less than one percent of the 407.1

million users worldwide. Even though the percentage of African Internet usage remains small, the number of users throughout the continent has increased enormously. The largest numbers of Internet users are in South Africa (1.82 million), Egypt (400,000), and Morocco (30,000) (Nulens *et al.* 2001: 323-324). Furthermore, in Ghana, Internet subscription has increased from ten in 1996 to more than five thousand by 2002. Also, cyber cafes and Internet chat rooms in this country are operating on a monthly rate of thirty US dollars or less. In Nigeria, since the Global System for Mobile (GSM) communication issued licenses in 2001, the country's IT sector has experienced a dynamic growth in the use of cellular products. By August of 2003, there were three million subscribers. With five major mobile phone providers: MTN, GSM, NITEL, GloMobile, and Econet Wireless along with more than ten million cellular phone subscribers as of February 2004, this growth will continue and further expand in the next few years (Ngwainmbi 2005:301).

Conclusions and Recommendations

The initiatives along with the ongoing IT projects throughout the African continent demonstrate that there are enormous potentials and possibilities for an information society to develop in Africa. However, in order to make this a reality, the following measures must be taken by all African governments and the civil society. The first is coming-up with sufficient funds to finance the technological infrastructure. Although both AISI and the African Union's e-Commission are in place, finding enough money to upgrade and expand the continent's hardware and software IT infrastructures is still a major challenge. So far, Africa has relied on loans and foreign direct investment to finance the construction of its technological infrastructures and networks. Both the African Union and the African governments must do their best to mobilize local resources continental-wide as well as raise funds from the African Diaspora throughout world to establish IT development banks or funds (Ya'u 2004: 26). The second is to upgrade educational capacities because all African nationals must be empowered to acquire basic functional literacy along with the necessary technical knowledge and skills to effectively utilize information technology. Therefore, African governments need to make ICT education as an essential component of the continent's educational system, starting from primary all the way up to post-graduate school. Additionally, Africa's educational system must be committed to providing gratis and high quality education for all; not just for those who can afford it (Ibid 2004: 27).

The third is to engage civil society in formulating policies and strategies to enhance the country's telecommunications networks as well as to make the Internet more accessible for all because technology must be applied to facilitate solutions to the inveterate problems facing the African continent as technology itself will not solve serious socioeconomic issues like urban and rural disparities or high unemployment rates. Thus, it is important to utilize technology to address Africa's problems and to improve the general living standards for all Africans rather than just blindly emulating the developed nations (Rathgeber and Adera 2000:210; Ibid 2004:25). Finally, it is essential for African governments and heads of state to improve the quality of governance in their countries because problems like kleptocracy, economic mismanagement,

and ineffective institutions are some of the major underlying causes of the mass exodus of skilled technical professionals out of the continent. In order to ameliorate this problem, not only do African governments need to improve the general economic conditions of their countries so that their national economies could absorb an abundant supply of well-trained technical workers, but also create favorable working and living conditions for them. Lastly, the development of Information and Communications Technologies is truly one of the biggest Pan-African projects of the twenty-first century, which requires the unity and unlimited cooperation among all African states as both the positive and negative externalities of technology are borderless.

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