MOST COUNTRIES OF SUB-SAHARAN AFRICA WILL FALL FURTHER BEHIND IN THE INFORMATION REVOLUTION

THERE ARE EXTREME DISPARITIES AMONG AFRICAN NATIONS; AS A RESULT, FEW STATEMENTS APPLY UNIVERSALLY

The African continent is extremely diverse, and few blanket statements can be made about information technology and information revolution developments that apply to the continent as a whole. We concentrate here on sub-Saharan Africa, but any statistics or recommendations must take into account the fact that South Africa overwhelms most statistical statements or projections for that region.

As one example of these disparities, South Africa has roughly half of the continent's IT infrastructure. North Africa and Nigeria each have about one-sixth, and all the rest of Africa accounts for only one-sixth of the infrastructure.[1] Even excluding South Africa, there are also dramatic disparities among the northern, eastern, western, and southern African regions, and within countries of those regions.

IN AFRICA, MASS MEDIA PREDOMINATE OVER POINT-TO-POINT COMMUNICATION

With those caveats, there are several measures that help place Africa in context. First, mass media (radio, television) are now, and will remain for the next decade or so at least, the predominant information dissemination media in Africa. For every telephone in Africa, there are 2,500 televisions and 14,000 radios.[2]

COMPARED WITH THE REST OF THE WORLD, AFRICA IS FALLING BEHIND

In 1990, Africa had 2 percent of the world's telephones, but in 2000 it had only 0.8 percent. (These data, taken from International Telecommunications Union tables, represent fixed lines, not wireless, and there are now more mobile telephone subscribers in Africa than fixed-line subscribers.[3] Nevertheless, with about 12 percent of the world's population, Africa is far behind in per capita telephone subscribers.)

Regarding Internet access, South Africa again dominates the continent's usage; it has approximately 750,000 dial-up Internet subscribers out of about 1.36 million for all of Africa, or about 55 percent of the total. The 10 countries of Central Africa,[4] by comparison, have a combined total of just 10,000 subscribers (1.4 percent of Africa's total).[5] Overall, in 1998, Africa had just 4 percent of the world's Internet hosts[6] and 0.22 percent of World Wide Web sites.[7]

One must also remember how poor Africa is in general. At an earlier conference in the RAND/NIC series on the global course of the information revolution, one speaker commented that the wealthiest 15 individuals in the world, taken together, have a greater net worth than all of sub-Saharan Africa.[8]

AFRICA'S IT PROBLEMS ARE NOT PRIMARILY TECHNICAL: THEY INVOLVE FACTORS OF CULTURE, COMPETENCE, CAPITAL, AND CONTROL

Many factors shape a nation's approach to the information revolution, such as GDP per capita, how a society deals with change, the role of government and laws, and the structure of capital markets.[9] These factors, of course, are relevant to the nations of Africa too; however, even more fundamental factors seem to apply in Africa, so we use a "four Cs" categorization to introduce and discuss those factors: culture, competence, capital, and control.[10] We describe those categories below and relate them to selected examples within sub-Saharan Africa.

Cultural Factors Complicate and Impede the Spread and Use of Information Technology in Africa

Cultural factors such as language, nationalism, stratification, legal framework, vertical authority relationships, trust, meritocracy, and concept of information complicate and impede the spread and use of information technology in Africa. For example, if the predominant language of the country is not one of the world's most prominent, many of the world's websites will be unreadable, and software will be late in being translated into that language (if at all). Consider the case of the Democratic Republic of the Congo. Some 200 to 250 dialects are spoken, with Swahili, Lingaga, Tshiluba, and Kikongo as officially recognized national languages. However, some of the young Congolese who have attended the better schools are literate in English.[11] South Africa has 11 official languages, although English might be considered a unifying force in that country. In West Africa particularly, a number of countries use French as their predominant international language, creating a divide of scarce information resources between those tailored for French speakers and those tailored for English speakers.

Another cultural factor is nationalism. If the nation is strongly nationalistic, it will tend to resist "foreign" influences, such as those provided by IT products and services originating elsewhere. A possible negative influence of IT in some African countries is its use by nationalists to spread violent polemics; in the hands of extremists, it could be used for further disruption. This applies both to mass broadcast media and to interactive communications on the Internet and call-in radio. Throughout much of Africa, there are strong ties to tribes that can be reinforced through these media, complicating efforts at regional or continentwide solutions.

Consider various forms of stratification within most African societies. Much of the Internet penetration in Africa is within the major cities, yet most of the population lives in the countryside. In a discussion of Nigeria, for example, it is stated that "80 percent of the people live outside the cities. . . . In the rural areas, travel of 50 km to a pay phone is average."[12] High illiteracy rates also create stratification in use of the Internet, although mass media such as radio can ameliorate this problem.

It Takes an Educated Populace to Know How to Bring IT to Those Who Most Need It

The category of competence involves factors such as education, training, and sophistication of IT use. In sub-Saharan Africa, approximately 23 percent of youth ages 15 to 24 are illiterate (year 2000 figures), and as of 1998 in Central and Western Africa, only 57 percent of children of primary-school age were enrolled in school.[13] The stratification in IT use between educated versus uneducated and urban versus rural is likely to continue into coming generations. Because of these factors, the important role of mass information technologies such as radio and television, rather than the Internet, is also likely to continue in Africa for at least the next decade or two.

Many sub-Saharan Countries Lack Financial and Physical Capital

A third category of factors relevant to IT usage and expansion involves the availability of financial and physical capital, either from within the country or provided by external parties that view the region as a good investment. Physical capital includes the installed base of electric power and telecommunications: Are they available, stable, and provided at reasonable cost? Many countries in Africa are hampered by the fact that the telecommunication system has been a state monopoly, and the state is reluctant to give up this important source of revenue. License fees for alternative telecommunication services have therefore remained prohibitively high: In Nigeria, a multioperator license for a voice satellite link (VSAT) costs more than $100,000; to create an Internet Service Provider (ISP) in Zambia, the fee is $40,000.[14] And, as a recent report indicates, in West Africa there is regionalized war that seems intractable and resistant to peace-keeping; that war is a deterrent to investment because spending goes to training the military rather than into IT.[15,16]

Investment *is* being made in telecommunications and Internet infra-structure in Africa, but factors such as the above create impediments that increase the likelihood that Africa will fall further behind much of the rest of the world in IT developments.

The Agencies of Control in sub-Saharan African Countries Often Impede IT Development

Another set of factors influencing IT development involves the exercise of control. It is important to ask of a country: Who has the power to determine and effect the spread of IT within the country? In particular, is control lodged primarily in a government, the military, religious organizations, or the private sector? And is this control restrictive and constraining, or promotional and guiding? While many African countries' regimes were highly centralized and controlling in the past, a recent report indicates that

> [The years 1995–2000] continued the process of policy decentralization. Support for the old statist model weakened. There were significant increases in countries' competitive market orientation in the [IT] marketplace. And where only a few years earlier government had owned virtually all the [IT] sector, now a new amalgamation of foreign, domestic, public, and private ownerships emerged.[17]

In forward-looking countries, there is also increasing reliance on regulatory agencies that are relatively independent of governmental control and that oversee IT developments in a balanced manner. In other countries (Kenya is an often-cited example), central government continues to dictate and restrict IT policy to a degree considered unhealthy for adequate expansion and accessibility to the country's citizens.[18]

THERE ARE, HOWEVER, POSITIVE INDICATIONS THAT THE INFORMATION REVOLUTION IS MOVING FORWARD IN AFRICA

Most of the factors discussed above are impediments to rapid IT growth in Africa. However, substantial progress is being made. There is growth of kiosks, cybercafes, and other forms of public Internet access; PCs are being added to community telephone-access shops and schools; the ISP "Africa Online" has established hundreds of public-access kiosks as part of a franchise program; and cellular telephone usage is expanding dramatically, especially in countries with poor traditional phone service.[19]

Other indicators are also positive: per capita telephone penetration nearly tripled from 0.16 to 0.39 per 100 people between 1996 and 1999, and by 2001 the number of cell phones will equal 80 percent of the 1996 landline telephone density;[20] and the number of television and radio broadcasters has increased to include private owners, domestic content, and continental coverage.[21] More than 600 ISPs now exist in Africa, with a total outgoing bandwidth of more than 700 megabits per second.[22]

EXTERNAL FACTORS MAY INDIRECTLY IMPEDE IT GROWTH IN AFRICA

Two additional external factors, however, may impede dramatic IT growth in Africa: the HIV/AIDS epidemic, and a refocusing of U.S. attention after the events of September 11, 2001.

The HIV/AIDS Epidemic in Africa Affects the Region's Development Prospects

At the end of 2001, it was estimated that more than 28 million sub-Saharan African adults and children (about 8.4 percent of the population) were infected with HIV/AIDS—of 40 million cases worldwide.[23] Approximately 2.3 million sub-Saharan Africa adults and children died of the disease during 2001. In six sub-Saharan countries, more than 20 percent of all adults ages 15 to 49 have HIV or AIDS,[24] and these cases are affecting the most productive sector of society. These statistics will not improve soon: The vast majority of Africans living with HIV do not know they have acquired the virus. AIDS has become the biggest threat to the continent's development.

In the Post-9/11 Era, Much of the World's Attention and Resources Will Be Focused Elsewhere

The second factor relates to September 11, 2001. U.S. government, and other countries', attention and resources are now focused on the war on terrorism and—to a lesser extent—on the continuing Middle East conflict, and other foreign policy interests may suffer or be redirected. World interest in African development is likely to focus on those regions of great instability or governmental collapse that could

become "safe harbors" for terrorist cells. Support for IT-related developments is likely to concentrate on issues of security and governmental stabilization, such as the use of IT for improved airport security.[25]

For all the reasons stated above, it is likely that information technology improvements will continue in Africa, but the region will continue to fall further behind much of the rest of the world during the next several decades.

NOTES

[1]These statistics and much of the rest of the discussion in this chapter are taken from the conference proceedings of the Workshop on Information Technology in Africa (NIC/State Department, 2002). The workshop was held in October 2001 in Washington, D.C.

[2]NIC/State Department (2002), p. 13.

[3]NIC/State Department (2002), p. 19. By comparison, Latin America has 6 percent of the telephone lines and 8 percent of the population, and Asia has 13 percent of the lines and 57 percent of the population. (These statistics are from a white paper distributed at the NIC conference, "An Overview of Internet Connectivity in Africa" by Mike Jensen, August 5, 1998.)

[4]Central Africa comprises Chad, Cameroon, Central African Republic, Gabon, Equatorial Guinea, Sao Tome and Principe, Republic of the Congo, Rwanda, Burundi, and Democratic Republic of the Congo.

[5]NIC/State Department (2002), p. 20.

[6]Jensen, "An Overview of Internet Connectivity in Africa," p. 12.

[7]NIC/State Department (2002), p. 13.

[8]Hundley (2000), p. 54.

[9]Such factors are described in more detail in Chapter Six of this report.

[10]These four factors were introduced by Ernest Wilson at the NIC conference documented in Hundley et al. (2000), and presented for discussion at the NIC Workshop on Information Technology in Africa (NIC/State Department, pp. 10–11). The discussion in this section is adapted from the reports of those two conferences.

[11]NIC/State Department (2002), p. 36.

[12]NIC/State Department (2002), p. 44.

[13]United Nations Economic and Social Council figures, available at http://www.africana.com/Articles/tt_215.htm (accessed by the authors during the course of their research).

[14]NIC/State Department (2002), pp. 45, 51.

[15]NIC/State Department (2002), p. 49.

[16]West Africa comprises the countries of Mauritania, Mali, Niger, Nigeria, Benin, Togo, Ghana, Cote d'Ivoire, Liberia, Sierra Leone, Guinea, Guinea-Bissau, Senegal, Cape Verde, and Burkina Faso

[17]Ernest Wilson III and Kelvin Wong, "African Information Revolution: A Balance Sheet," white paper distributed at NIC Workshop on Information Technology in Africa (unpublished).

[18]Wilson and Wong, "African Information Revolution: A Balance Sheet."

[19]Mike Jensen, "The African Internet: A Status Report," white paper distributed at NIC Workshop on Information Technology in Africa (unpublished).

[20]Wilson and Wong, "African Information Revolution: A Balance Sheet."

[21]Wilson and Wong, "African Information Revolution: A Balance Sheet."

[22]NIC/State Department (2002), p. 20.

[23]Joint United Nations Programme on HIV/AIDS, "AIDS Epidemic Update," December 2001. Available at http://www.unaids.org/epidemic_update/report_dec01/index.html (accessed April 15, 2003). All the statistics and statements in this paragraph are taken from this report.

[24]Sub-Saharan countries with over 20 percent infection rates are Botswana (38.8 percent), Namibia (22.5 percent), South Africa (20.1 percent), Swaziland (33.4 percent), Zambia (21.5 percent), and Zimbabwe (33.7 percent). Taken from the UNAIDS "Report on the Global HIV/AIDS Epidemic" (July 2002). See http://www.avert.org/subaadults.htm (accessed April 15, 2003).

[25]NIC/State Department (2002), pp. 53–54.