Introduction

As economies around the world take off into cyberspace, Africa, the perennial laggard, is in danger of missing the launch. With more than 10 percent of the world’s population, Africa has less than one percent of the world’s Internet users. The U.S. Internet Council’s State of the Internet Report 2000 places the number of African users at around 3 million, compared to 136 million in North America, 83 million in Europe, and 69 million in Asia. That works out to about one Internet user for every 250 people in Africa, compared to the world average of one for every 35. According to the UN, Africa’s 780 million people have about as many Internet hosts as tiny Latvia, with a population of 2.5 million. We have read quite a bit about the digital divide in the United States, but the numbers above indicate that there is also a huge digital divide growing outside of our borders. Given the fact that Africa is still critically short of the basic infrastructure, technology, systems and computer skills required to support electronic commerce and the “new economy,” the gap is likely to worsen before it gets better. The world’s poorest continent has by far the lowest telephone densities in the world, the lowest number of computers, and the most expensive telecommunications charges. Until these conditions are improved, Africa will continue to lag behind the developing countries of the world in technology adoption. In the remainder of this paper, I will assess the current state of the information technology infrastructure in Africa, as well as the strategies and initiatives that are being implemented to try to improve that infrastructure and bridge the digital divide.
Information Technology Infrastructure in Africa

While Africa’s communications and information infrastructure has improved dramatically over the past few years, the majority of Africans who do not live in the capital cities and are not part of the privileged few still cannot afford to access these improvements. Access to telephones across the continent is still extremely scarce. There are only about 14 million lines on the continent, less than the number of phones in Manhattan or Tokyo. Among these 14 million lines, the vast majority are concentrated in North and South Africa, leaving only 3 million lines to be shared among the remaining 600 million people on the continent. Finally, most of the phone lines are concentrated in urban areas, while over 70% of the population lives in rural areas. As a result, most Africans have never even made a phone call, let alone surfed the web.

There are only about 100,000 dialup Internet accounts in Africa for over 750 million people. Because Internet Service Providers are usually concentrated in capital cities, even if there is a computer available, it takes an extremely expensive long distance call to connect to the Internet. On the continent as a whole, it remains prohibitively costly to access the Internet. The average cost for using an Internet account for five hours a month in Africa stands at $50 compared to about $20 for unlimited access in the United States. Furthermore, most of the information available on the Internet is oriented toward western and urban populations, with little that is relevant to the average person in Africa.

In order to understand the current state of the technology infrastructure in Africa and why the above numbers exist, one must begin with an in-depth analysis of the telecommunications industry. In most African countries, the telecommunications
services are provided by state-owned monopolies. This has been the case for decades, and is the main reason behind the wretched state of the telephone systems today. With a myriad of pressing issues such as healthcare, housing, and education, African governments have historically put building communications networks further down on the “to do” list, although they acknowledge the problems this presents. In addition, many African governments have traditionally seen the telephone companies as money-making assets for themselves and their friends. This has resulted in a great deal of corruption in the industry. Getting a phone line installed can be a very difficult task. Unless bribed, telephone company officials can keep you waiting a year or more for a line. Another problem that plagues the industry is a common practice known as “tossing the line,” in which telephone engineers cut a line and then offer to reconnect it in exchange for an exorbitant reconnection fee. Finally, thieves regularly steal the cable lines from the ground, presenting significant obstacles for any system expansion efforts. While privatization of state-owned telephone companies has started in many African countries, there is still much work to be done to bring the fixed line telephone systems up to speed.

The problems brought about by the poor telecommunications infrastructure in Africa have increased significantly with the advent of the Internet. Before the digital economy came into existence, Africans were left behind, but only in regards to telephone access. Today, they are being left behind in regards to both telephone and Internet access. As with phone service, Internet access in Africa is largely confined to the capitals and major towns. Although a growing number of countries have Internet points of presence in some of the secondary towns, for most people in Africa it is still very expensive to access the Internet. In addition to the costs of long distance calls to ISPs,
local call tariffs are also a major barrier for anyone outside the upper income bracket. In contrast to North America where local calls are free, effectively giving the public permanent access to the Internet if they wish, local call charges constitute the largest part of the expense in maintaining Internet connectivity in Africa. While call charges are the major problem, Internet Service Provider subscription fees also present an obstacle to access. While the average charge is $50 a month for 5 hours of access, charges can vary from $10 to $100 a month in some countries, largely reflecting the amount of competition in the market, the varying tariff policies of the public telephone operators, and the different national policies on access to international telecommunications bandwidth.

Even for those that can afford Internet access in Africa, the Internet Service Providers in the region face problems gaining quality Internet connections and access to sufficient bandwidth. Due to high international tariffs and lack of circuit capacity, obtaining enough bandwidth to deliver web pages over the Internet is still a major problem for ISPs in most African countries. As a result, a growing number of African Internet sites must be hosted on servers that are in the U.S. or Europe. In addition, there are no regional backbones or Internet links between neighboring countries in Africa because high international tariffs charged by telecom operators discourage Internet Service Providers from establishing multiple international links. This means that all Internet traffic between African countries flows over a single international circuit and African countries are forced to pay US or European service providers costly fees for this traffic. In order to bring down the prohibitive costs of Internet access, African countries must reform their internal telecom fee structures and improve their external networking infrastructures.
Now that we have explored the problems with the telecommunications infrastructure in Africa, we should explore the other major barrier to increased technology adoption on the continent – the level of computerization. Africa’s level of computerization is very low, primarily because of the high cost of equipment relative to the low levels of economic development and the lack of human capital necessary to make effective use of computers. Computer prices are inflated in Africa due to the fact that many import tax regimes categorize information and communication technology goods as luxury items, thereby subjecting these goods to excessive import taxes. The import taxes make these goods all the more expensive, and even more unobtainable for average citizens. In addition to the barriers to buying new computers, there are also problems with maintenance and support of existing computers. Because of poor maintenance and insufficient skills to diagnose system problems, many computers are currently out of commission. With improved computer maintenance training, these computers could easily be reactivated and brought back into working order, increasing the installed base in the region.

**Infrastructure Improvement Initiatives**

As you can see from the discussion above, the technology infrastructure in Africa is severely crippled. In order for Africa to make strides to catch up with the rest of the world’s migration to the new economy, much must be done, and it must be done quickly. To help Africa bridge the digital divide and gain access to new technology, organizations such as the World Bank and the IMF have established numerous taskforces and forums dedicated to improving the situation. For example, the Economic Commission for Africa (a UN organization) recently established the African Information Society Initiative (AISI)
to help foster technological advances in the region. AISI calls for the formulation and
development of a national information and communication infrastructure plan in every
African country, driven by national development priorities, and proposes cooperation
among African countries to share the success of such experiences. The ECA also
established the African Development Forum last year to provide research and guidance to
African nations on key development issues. Recognizing the importance of technology
infrastructure, the ADF’s first conference in 1999 dealt with “The Challenge to Africa of
Globalization and the Information Age.” While international development organizations
can certainly help the cause, aid from the private sector is also crucial to the Internet’s
growth in developing nations. The private sector has forged the Internet’s growth in
developed countries and is most familiar with the technological, economic, and political
issues facing the global business community. For these reasons, private firms are the
most well positioned to lend their business expertise to the developing countries of
Africa. One recent initiative, the Africa Technology Forum, combines representatives
from both the public and private sectors. The Africa Technology Forum is a non-profit
organization led by representatives from the World Bank, the IMF, and several
multinational high technology companies. The organization seeks to serve as a platform
for African companies to exchange ideas, establish an online information clearing house,
and encourage development of the continent’s high technology industry. The hope is that
as African countries continue to privatize their telecommunications sectors, blooming
industry in the region will step in and help overcome the infrastructure problems standing
in the way of increased Internet access.
While most people acknowledge the role that organizations such as the World Bank and the IMF can play in formulating a strategy to improve the information technology infrastructure in the region, some observers feel that the answer to Africa’s problems may be much easier than previously thought. Rather than waiting for African governments to privatize the telecommunications industry and increase fixed line reach, many believe that the continent should begin focusing the majority of its efforts on developing wireless capabilities. Why wait years for state-owned monopolies to be privatized and fixed line systems to be built out, when these steps can be avoided in favor of wireless technologies? Granted, there are still government and regulatory hurdles to overcome in order to gain wireless licenses in African countries, but these obstacles pale in comparison to those that you would encounter if you try to build out fixed line systems across the entire continent. In the near future, optimists are attaching their hopes to mobile phones, which have more than five million users, including a fair share in the impoverished townships. Mike Jensen, a telecommunications and Internet consultant who works with the African Information Society Initiative, believes that wireless will have a major impact over the next few years, in spite of the fact that the systems being installed at present tend to be voice-capable only. Take for example, the South African township of Soweto, large portions of which lack plumbing and electricity. “Phone shops,” establishments where time can be rented on a cell phone, are prevalent throughout Soweto. While these cell phones aren’t quite mobile (they’re chained in to prevent theft), they are by virtue of their wirelessness, accessible to many in the township.
According to Jensen, of even greater potential is the independent satellite market, whereby individual nations can have broadband access without being tied to any regional communication alliance. Satellite access could prove to be a solution to the international bandwidth crunch, as well as to the high access fees African countries are forced to pay U.S. and European providers for access to their networks. One company, Orbicom, is currently working on a two-way satellite Internet link with a teleport on American soil to give direct access to the U.S. Internet backbone. Paul Edwards, the CEO of Orbicom, estimates the cost of user terminals at below $2,000. If these terminals can be shared between households or townships, they could be more affordable in the long-term than any of the Internet access alternatives currently available.

In addition to looking to the potential benefits of wireless, many people are also looking to a different model of Internet adoption to help Africa catch up with the rest of the wired world. When Americans and Europeans think of Internet use, one image usually comes to mind – one person sitting in front of one machine. While those in the western world are pre-dispositioned to adopt this image, it is not the way Internet adoption is taking place in developing countries. Internet adoption is taking place via public Internet kiosks. In Peru, they are called Internet cabinas, and they can be seen on block after block, in both rich and less affluent neighborhoods. Many of these cabinas are unofficial, with families renting PCs out by the hour in their homes. Similar kiosks are popping up across Africa, both in private residencies and in more traditional places of business. This “one computer/many users” model may prove to be the answer to the prohibitive costs of computers in Africa. Computer ownership in Africa is rare, and this is unlikely to change anytime soon. Internet kiosks provide an affordable way for the
public to access e-mail and the Internet, which is key to expanding Internet usage and e-commerce in Africa.

Africa Online, the only regional pan-African ISP, has recognized the potential of this model. When Africa Online started its business, the company focused only on people who could afford computers. This was very much the elite in most African countries. The low computer penetration figures in the region recently led the company to look at other ways of reaching the vast number of people in Africa that don’t have computers. As a result, the company developed its E-touch initiative – a program to install Internet access in thousands of public communications centers across Kenya. That way, the vast majority of Kenyans who don’t have their own phone or PC can use the pay-for-use service. There are currently 220 E-touch centers across Kenya serving more than 40,000 people. Two-thirds of the centers are outside of Kenya’s cities and cater to the rural population that has so far been ignored by technological advancements. In a similar development, Africa Online recently teamed up with Barclays Africa to build Internet cafes inside Barclays’ banks. The cafes are designed to give Africans increased access to the Internet as well as to help Barclays implement e-banking initiatives in the future. The strategy is a clear win-win for all parties involved. Africa Online increases its customer base, local citizens gain access to technological resources they otherwise would not have, and Barclays begins to educate its consumers on the ease of using technology, in hopes of taking advantage of low cost e-banking initiatives in the future.

**Conclusion**

It is apparent that the information technology infrastructure in African countries is severely behind that of more developed nations. Long-standing inefficiencies in the
telecommunications industry and high costs of information technology products are largely to blame for the current state of affairs in Africa. While the current situation certainly does not look rosy, there are reasons to believe that vast improvements can be made in the coming years. With international initiatives coordinated by organizations such as the UN, the World Bank and the IMF, African countries should be able to develop and implement sound, sustainable strategies for future growth. In addition, more widespread adoption of wireless technologies and the “single computer/many users” model for Internet access could also help move the region’s technology initiatives forward. With progress on each of these fronts, there is good reason to believe that African countries can at least start to bridge the gaping digital divide. Doing so could be their best chance to catch up with, and in some cases, leapfrog the developing world.
References


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