

Access to Computers and Communication Networks in Ghana

Brief Summary

In this paper you would get a quick overview of Telecom liberations in Ghana after which the demand for telecoms, Internet and computers is still very high. I enumerate some of the efforts to address the need for Information and Communication Technologies (ICTs) in education, health and rural entrepreneurship but restricting these efforts is the lack of firstmile solutions to reach the rural poor. I then discuss two locally developed wireless solutions to address the lack of firstmile as well as elaborate on some of the capacity development institutions. The papers ends with the challenges faced in deploying ICT in Ghana namely regulation and policy ineffectiveness, High SAT 3 pricing and distribution and financing of ICT Entrepreneurs.

Introduction

Ghana has been one of the African countries who in the late 1990's were in the forefront of the liberation of the telecommunications sector to attract investments and improve competition within the communication sector. The communications sector was deregulated in 1994 when the government initiated the implementation of the Accelerated Development Programme (ADP) --- a five year programme for restructuring of the communication industry.

The ADP Programme ended in 2000 with the realization of the following objectives: teledensity increased from 0.34 lines for 1000 inhabitants in 1994 to 1.16 lines in 2000; public phones per 1000 inhabitants increased from 0.001 in 1994 to 0.16 in 2000; the creation of the National Communications Authority (NCA) in 1996; the licensing of a second national operator; the partial privatization of Ghana Telecom with Government maintaining 70% share; the liberalization of the communication sector, and enabling the operations of numerous private FM stations and a number of private TV stations.

High Demands

Demand for Internet access and telecommunication is still very high in Ghana. Communication with the rest of Africa – and the world – is exploding. But reliance on wired telephone lines, as a link to the web, is unreliable and slow. The ADP did not achieve the feat of creating a good terrestrial infrastructure for connectivity (3% teledensity). Wireless links to the web are much more common today than five years ago but these links are very expensive. Corporations and big international agencies, such as the World Bank can afford them but most small organizations and individuals cannot. Ghana lacks a publicly supported Internet infrastructure. Access to the Internet in the over 2,500 secondary and post-secondary schools in Ghana is less than 1%.

The costs of PCs are way beyond the reach of the average Ghanaian not to talk about the majority of Ghanaians who are below the minimum wage threshold. Computers are still considered a luxury in Ghana and it is only the rich that can afford them. There is a lot of effort to relocate refurbished good working condition computers that are affordable here. This is a growing phenomenon though there are critics of it being a scheme to dump obsolete computers in Ghana and Africa. There are about four hundred thousand (400,000) PCs both new and refurbished in Ghana and this is increasing at a speedy pace though extremely inadequate compared to a population of about twenty million people (20,000,000).

Efforts

Education, Health and Agriculture are critical sectors of the economy and proceeding are efforts to use ICTs in these sectors. Though these are not e-learning, telemedicine and e-commerce projects, they are steps to such ends.

Education

There have been a lot of efforts to introduce and make computers and ICTs part of the educational system because ICTs are seen as an aid to better education as well as catalyst for creation of a better workforce. Most of these efforts have a fundamental believe that once we can make students computer literate we would be building a good and competitive workforce for the knowledge economy. Some of the Universities, Senior Secondary Schools, Junior Secondary and in recent times Primary Schools have Computers Departments with labs. Some have Computer Clubs for extra curriculum activities while other have integrated computer training into their school curriculum with practical sessions at least once every week. The Worldbank's global Worldlinks programme (<http://www.worldbank.org/worldlinks/english/>) which had the vision of **using technology tools in the classroom to enhance teaching and learning outcomes** played a very representative role in the second cycle educational system of Ghana among other initiatives.

GeSCI

The Global e-Schools and Communities Initiative (GeSCI, <http://www.gesci.org>) is seen as another major undertaking from the UN to take efforts in using technology in the educational systems to another level. Ghana as one of the pilot countries stands to benefit from the fact that though the Worldlinks and other efforts have run out of resources, the GeSCI would play a continuing role which leverages them. The GeSCI is an independent mechanism which was created to stimulate and support national and regional e-school initiatives. Created by the United Nations ICT Task Force, the distinctive feature of GeSCI is that it does not limit its impact to improving education through the use of ICT. It goes further and aims to use the strengthened educational infrastructure to empower local communities, by facilitating their access to global and local information and knowledge. This will significantly strengthen their capacity to benefit from e-health, e-commerce, e-government, e-democracy and all other empowerment tools that ICTs bring about.

The Initiative will bring together existing efforts and help to carry out national and regional programmes. It will work closely with other groups -- such as the New Partnership for Africa's Development (NEPAD) e-Schools Initiative -- that have similar objectives, as well as with local governments, the private sector and civil society. The first countries that will use the GeSCI approach are India (Andhra Pradesh), Bolivia, Ghana and Namibia. With the help of the GeSCI secretariat, local governments will bring together all national, regional and local stakeholders in education to create an efficient, comprehensive system for delivering education through ICT. Based on this system, the international GeSCI coalition will garner international services needed for implementing the system. The UN ICT Taskforce group on GeSCI held a stakeholders consultation with participants in Accra, Ghana from 19th to 20th of April 2004 to launch the Ghana programme. At the end of the conference it was decided that a team be commissioned to develop the detailed business and implementation plan for the Ghana project.

On a broader scale GeSCI will play five major roles:

- ?? Convene all the required players -- especially global players who cannot find a good way to play a useful role on their own -- to address the barriers that they face in contributing to e-school efforts;
- ?? Facilitate national and regional planning, by serving as a neutral facilitator and by contributing expertise and knowledge of best practices;
- ?? Help to raise resources, including by stimulating funding from governments, facilitating contributions by local communities, and connecting e-school efforts with development agencies, global foundations and private companies;

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- ?? Provide specific global services, such as a global education portal, and coordinated bulk purchasing of equipment and software among multiple countries;
- ?? Arrange for independent monitoring and evaluation, which can help attract donors and private companies concerned about their resources being well spent.

Health – National Health Insurance Scheme

The health status of Ghanaians has improved significantly over the last decades; infant and child mortality decreased by 16% and 24% respectively whilst life expectancy increased to 56.6 years. However, in terms of health attainment, Ghana ranks 144th amongst 191 countries assessed by the WHO and only 60% of the total population has access to health services, with the figure dropping to 45% in rural areas. There is also a lot of effort to provide health information in local languages on radio and television in the rural and urban areas as preventive measures.

The current government is pioneering a National Health Insurance Scheme (NHIS) as opposed to the Cash and Carry system of health delivery. The scheme which was launched this year by the President is to aid financial access to health care and the establishment of a Health Insurance Fund in order to make health care affordable to all especially those in the rural areas. Adult Ghanaians are to pay a monthly minimum subscription of six thousand Ghanaian cedis (US \$0.66). The government will cater for health treatment of the aged, poor as well as children of parents who both subscribe to the scheme. Below are some of the ways in which technology is been used in the health sector in Ghana.

MIMCom

Ghana has two sites as locations for the Malaria Research Network for Africa which is part of the Multilateral Initiative on Malaria (MIM) Communication Network (www.mincom.net). The Noguchi Memorial Institute for Medical Research located at the University of Ghana (<http://www.noguchimedres.org>) and the Navrongo Health Research Centre (<http://www.navrongo.org>) are generating health information from their field stations to feed the network. The system basically allows researchers an open link to send and receive mail, search medical literature and databases, share files and images. This is a permanent, continuous access 24 hours a day, 7 days a week system and at a minimal cost to participating users.

HealthNet

This is the SATELLIFE's Global Communication Network which links health workers around the world by email. It utilizes SATELLIFE's low- earth-orbit satellite to establish e-mail connectivity in various locations throughout Africa. It allowed health care providers who had been working in isolation finally able to communicate, share experiences and access information critical to their work. Ghanaian researchers use HealthNet to communicate with London School of Hygiene and the Tropical Disease Research Centre in Geneva. In what has been described as a major public health success story in recent times, African researchers used the network in the control of Onchocerciasis. This was as a result of multinational collaboration including Ghana to track the Black Fly (*Simulium*) larvae, the vector of the disease along the Volta River.

Satellife PDA Project

This was a collaborative effort between SATELLIFE and the American Red Cross Society (ARC) to demonstrate the usefulness and feasibility of using relatively inexpensive handheld technology (PDAs) instead of paper in collecting health information in Africa. Phase one of the project was carried out in Ghana during a massive measles immunization campaign by the ARC in December of 2001. It was found out that Individuals who were not familiar with computer technology were easily trained and deployed to collect data. They completed 2,425 surveys at 67

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locations in the targeted region, including 41 urban and 26 rural sites. They averaged 28 surveys per person per day. The PDAs were utilized in the field with no disruption from elements such as dust, dirt, and sunlight nor was loss reported due to security or breakage. Data was downloaded from the units rapidly and with no error enabling rapid analysis and prompt reporting to the local Ministry of Health. The 30 paper surveys took approximately 30 minutes to enter into a data base, a rate that would have taken over 40 hours to enter the PDA surveys by hand. The user satisfaction survey yielded positive results, 70% said PDA was easy to use, all were able to keep the screen clean, 87% had no problem reading the screen outdoors and 10% found it too confusing to follow but in all the project was a success because the speed and ease of gathering data was unprecedented and the in country costs was \$2000.

Stimulating local digital health content in Ghana is another health information project sponsored by the International Institute for Communication and Development (IICD) and Gamos to be implemented by the Health Foundation of Ghana in local communities in rural Ghana. This research project is testing ways to help 'push' for local content by building community capacities to create and distribute local knowledge on mother and child health in a digital format.

Rural Entrepreneurs

There is no direct ICT support for rural entrepreneurs (not even for urban ones) because the mechanisms and resources are not available. However there are efforts by some local Internet Service Providers (ISPs) to establish connectivity in some rural areas to aid access to information and the use of such information to improve livelihood and entrepreneurial prowess. It is worth mentioning though that a few NGOs like Technoserve and IICD have been supporting rural entrepreneurship with some form of technology to aid their activities.

Most of Ghana's pineapples and cashew are grown by small-scale farmers. TechnoServe believes that if these farmers can improve quality, boost volumes and connect with local, regional and international markets using technology, then the pineapple and cashew industry can become a major revenue generator for Ghana and an important driver of rural economic growth, creating jobs and increased incomes for farm families and entire communities. Hence TechnoServe has been providing technical assistance and business training to groups of pineapple and cashew farmers in Ghana since 1993.

The IICD is also working with some local partners in rural areas to support farmers through their E-commerce for Non-Traditional Exports Project which is establishing district information centers and developing databases on selected Non-Traditional exports in some districts. To provide information on, and promote Non-Traditional produce to producers, and traders/exporters in regional and international markets through a web-base information system. Farmers at a recent workshop expressed the need for ICTs such as radio and television to be used in communicating agriculture information to them. These form part of IICD's ICT in Agriculture programme which is taking roots in rural areas where farming is the main entrepreneurial activity.

Information, Technology and Poverty

It is clear from the submissions about that most rural people need information and that is a major concern – they are basic users of information and need information services. Provision of technology for supply of information is a challenge. This goes to confirm the study conducted by the Department for International Development (DfID) in which access to timely and relevant information was identified as one of the root causes of poverty. If we can make information available to rural people and create opportunities for them to communicate via emails, we would be helping them out of poverty but the big question is what technologies can we use to provide the firstmile since traditional PSTNs are not available or where they are -- they are inadequate for

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Internet deployment.

Wi-Fi Platforms

There are two local solutions to the firstmile problem and these are wireless connectivity platforms. The first of these solutions is the SAVA SERIES which connects Cyber Cafes and Community Access Centers to the Internet via a wireless network, through a reliable system that is affordable to the currently hundred and seventy (170) users on it. It is designed with the goal of providing a "total connectivity solution in a single box" with "zero connectivity downtime". It is a uniquely integrated system, designed and manufactured by Intercom Data Network (IDN), an Internet Service Provider in Accra, Ghana. The system implements a DSS 802.11b compliant broadband wireless solution, together with a host of internet applications that drastically reduce deployment costs for a business' Internet infrastructure. It is developed using Open Source software with a webmail interface. It performs domain name system (dns) functions which eliminates dedicated server requirements when deploying. It provides dial-up features and combines caching as well as routing in addition to its high end firewall security structure.

The second solution (Javelin™, Just Another Very Easy Link Into the 'Net) provides reliable email and Internet access from any location in the country at a fixed low price, primarily to schools. Javelin™ is reliable, the cost of connectivity and maintenance is low and the solution works perfectly for even large corporate email systems. It is an innovation by Arrow Networks System (ANS), a telecoms infrastructure provider. It combines wide reaching wireless narrowband technology with an open-source software suite that mirrors and caches web sites and emails locally on the Local Area Networks (LANs). In view of the wide reach of narrowband frequency, email/ Internet access can be granted to any school or community access centre anywhere. Schools / Community Access Centers are granted Internet access (web and email) on their LAN using a local server that mirrors and caches sites of interest, as well as emails. With the bulk of sites mirrored/cached, real-time link to the Internet becomes unnecessary and therefore achieved through the use of wireless narrowband, which slowly updates sites and fetches emails into local mailboxes when the network is not busy. It is important in that key web sites needed by schools to train students or the community for development needs are available on their LAN and a narrowband link is in place to regularly update the sites as and when needed.

Training Institutions

There are a lot of local ICT training schools as well as vendor training. National Institute of Information Technology (NIIT), Centre for Information and Communication Technology (CICIT, www.cicit.org.gh), IPMC, Atlantic Computers are some of the local names in ICT training. There are also University programmes offered in Computer Science and other engineering fields by the three (3) Universities in Ghana. One must admit though that the University programmes are really bad, example the University of Ghana does not have a computer lab and students are taught old theories. It is for this reason that the Ghana government has just completed a major partnership with the Indian government in establishing the Ghana India Kofi Annan Centre of Excellence in ICTs (www.kace-aiti.com.gh) which has the focus of bridging the technology and skills gap between academia and industry. It is serving as a major skills development and training institution by turning out graduate who can be incorporated into industry immediately as employees or employers. The establishment of the Multimedia Centre, an ICT incubator by the government is another major step towards creating the environment for innovation in the ICT industry locally. BusyInternet (www.busyInternet.com) a private sector effort to provide community access is a hotspot for a lot of people in the urban areas. It does not only provide hundred (100) computers connected to the Internet but training rooms, conference facilities and serviced offices for the local ICT community. At its liquid restaurant you would find a wi-fi hotspot where you can connect your laptop freely to the Internet if you have a wireless card.

Challenges

Regulation

These efforts are hampered by the lack of effective regulation and policy guidelines. The National Communication Authority (NCA, the regulator) lacks the capacity to provide effective forward looking regulation. This is a major obstacle to the proliferation of technology such as innovative solutions on wi-fi platforms developed by local entrepreneurs. In most developing countries like Ghana, it is the restrictive laws and an untrustworthy regulatory process that thwart the ability of local entrepreneurs and outside investors alike to supply the local markets with new technologies to grow communication infrastructure. The motivation for governments to restrain or prohibit new ICTs (for example, prohibitions on voice-over-Internet (VoIP), restrictions on unlicensed WiFi, the imposition of crippling ISP licensing requirements, limitations on access to fibre-optic cable connectivity) typically derives from the government's tight (and often highly corrupt) relationship with its traditionally state-owned monopoly telecom operator. This is not simply between old-fashioned telephone and new-fangled Internet technologies – it is a choice between two ways of behaving as a government and society. The old ways, fitting the telephone network, were closed, centralized, controlled, and top-down; the new ways, like the Internet itself, are open, decentralized, competitive, and technology-neutral.

SAT 3 pricing and distribution

Ghana is one of the landing points to the SAT 3 undersea fiber and Ghana Telecom (the incumbent Telecom operator) is the contracting local representative and though the fiber is lite, Ghana Telecom has priced it above the market. The Ghana Internet Services Association (GISPA, www.gispa.org.gh) is petitioning the government through the Ministry of Communication and Technology for Ghana Telecom to reduce the cost of a half-circuit E1 with an IP to \$6000 since that is the international market price, from the current \$10,000. Ghana Telecom is yet to develop the internal structures to distribute the fiber nationwide. However the national power company, Volta River Authority has a subsidiary, Voltacom which is developing the fiber on the national power pillion to provide a nationwide fibre backbone. The south sector of this fiber has being developed but also priced far above the market so question is, why are all these fiber networks being priced above the market? If the government takes a leadership role in bringing the external and internal fiber together into a private entity, would that not make an impact on price and give the country a national fiber backbone? This is a clear indication of the lack of policy guidelines, foresight and vision. This is at the root of the problems and challenges we are faced with.

ICT Financing

There is no microcredit movement for ICTs in Ghana and getting loans from the banks is a non-starter because the interest rates are so high, one cannot afford them. This is a major hindrance to ICT development in Ghana; most start their enterprise with their own money and mostly support from family members. Most businesses are started through informal means of financing. A local non-banking financial institution called Fidelity Group established an investment fund but they make a minimum investment of \$500,000 (how many startups can go in for it?) and have put such in BusyInternet, the biggest Internet Café in West Africa if not Africa. There are also recent efforts to train and equip small entrepreneurs with skills and seed capital to start their business but that has a long way to go in addressing the widening gab.

When these three (3) major challenges are addressed, Ghana would move quickly to become competitive in the global economy. Local entrepreneurs and individuals have proved that with some support they can leverage their skills and move the countries economy from the current state into a more robust one with ICTs not only as enablers of socio-economic development but as service sectors in themselves to create industry and jobs.

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