

ICT Investment Opportunities in East Africa

Country Specific Market Analysis

Uganda

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Context

This country report is one of four produced for the International Finance Corporation (IFC) summarizing the results of a feasibility study into investment opportunities in the ICT sector in four East African countries: Kenya, Uganda, Tanzania and Mauritius. A separate regional report has been produced that consolidates the findings from the four countries and looks at the overall key trends and market opportunities. There is also a confidential report on potential investment possibilities, based on interviews and discussions with business people and public sector officials in the four countries.

The four country reports present an overview of the current situation in the information and communications technology (ICT) sector in each country, and they include information on the economy, education, policy and regulatory environments, status of specific ICT markets, challenges and concerns and potential market trends likely to rise to investment opportunities.

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LIST OF ACRONYMS

CAGR	Compound Annual Growth Rate
CBO	Community-based Organization
CRM	Customer Relationship Management
DAB	Digital Audio Broadcasting
DANIDA	Danish International Development Agency
EAC	East African Community
EFT	Electronic Funds Transfer
EPZ	Export Processing Zone
ERP	Enterprise Resource Planning
ERT	Energy for Rural Transformation
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GIS	Geographic Information System
HFC	Hybrid Fiber Coaxial
HIPC	Highly Indebted Poor Countries
ICT	Information and Communications Technology
IFC	International Finance Corporation
IFMS	Integrated Financial Management System
IICD	International Institute for Communication and Development
IP	Intellectual Property
IPPS	Integrated Personnel and Payroll System
IRMIS	Integrated Resource Management Information System
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
ITES	IT Enabled Services
IXP	Internet Exchange Point
KPC	Kenya Pipeline Corporation
LAN	Local Area Network
LUG	Linux User Group
MIS	Management Information Systems
MSI	Mobile Systems International
NGO	Non-Governmental Organization
NITA-U	National Information Technology Authority - Uganda
NSSF	National Social Security Fund
OSS	Open Source Software
PC	Personal Computer
PICTA	Private Sector ICT Association
POP	Internet Point of Presence
PSFU	Private Sector Foundation Uganda
RCDF	Rural Communication Development Fund
SAFE	South Africa Far East
SAN	Storage Area Network
SME	Small and Medium Enterprise
SMME	Small, Medium and Micro Enterprises
SNO	Second Network Operator
UBIN	Uganda Business Information Network

UCC	Uganda Communications Commission
UCS	Uganda Computer Services
UDG	Uganda Development Gateway
UIA	Uganda Investment Agency
UICT	Uganda Institute of Information and Communications Technology
UNCST	Uganda National Council for Science and Technology
UNCTAD	United Nations Conference on Trade & Development
UNHCR	United Nations High Commissioner for Refugees
UNIDO	United Nations Industrial Development Organization
UPTC	Uganda Posts and Telecommunications Corporation
USAID	United States Agency for International Development
USD	United States Dollar
USH	Uganda Shilling
USSA	Uganda Software Services Association
UTL	Uganda Telecommunications Limited
VASP	Value Added Service Providers
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
WiFi	Wireless Fidelity
WITSA	World IT and Services Association
WTO	World Trade Organization
xDSL	Various Digital Subscriber Line technologies

1. Uganda Today



Map of Uganda showing major cities and borders¹

Uganda, located in East Africa, has a population of approximately 22 million, of which about 85% live in rural areas. The largest city and the capital is Kampala, which has roughly one million inhabitants. Other cities in Uganda are small, none of which have more than 100,000 inhabitants. English is the official language, and it is taught in grade schools, used in courts of law and by most newspapers and some radio broadcasts. However, only a small minority of the population uses English as a first language. Ugandans primarily speak one of over 45 dialects of which Luganda is the most commonly spoken of the local languages. The other widely spoken languages are Swahili, Ankole/Rutoro, Kinyarwanda and several Nilotic dialects such as Luo.

¹<http://www.cia.gov/cia/publications/factbook/geos/ug.html>

Uganda achieved independence from the United Kingdom in 1962. The dictatorial regime of Idi Amin (1971-79) was responsible for the deaths of some 500,000 people; guerrilla war and human rights abuses under Milton Obote (1980-85) claimed at least another 100,000 lives. The current president is Lt. Gen. Yoweri Museveni, who seized power in January 1986. Subsequently, he was elected president in 1995 and again in 2000. During the 1990s, the government promulgated non-party presidential and legislative elections.

Administratively, Uganda consists of 56 districts. The legal system is based on the English common law. The head of state is called a president and has full executive powers over all matters of government. The prime minister assists the president in the supervision of the cabinet. The president is elected by universal suffrage on a popular vote for a five-year term. There is currently a debate about the merits and demerits of a term limit for the presidency, and whether President Museveni should be eligible for re-election for another five-year term in 2006 when his current term comes to an end. This would require a constitutional amendment as he has already served the maximum amount of terms allowed by law.

Only one political organization, the Movement (formerly the National Resistance Movement of which President Museveni is the chairman) is allowed unfettered, although a recent court order has eased restrictions on other political parties to operate. The president maintains that the Movement is not a political party, but a mass organization, which claims the loyalty of all Ugandans.

Uganda's economic performance has been impressive in the past decade. The average real rate of GDP growth has been 6.9 per annum since 1990/91. Significant progress has been registered on trade liberalization, privatization, civil service reform, financial sector reforms and decentralization initiatives. Inflation has been at reasonable levels in the past few years, and is presently about 5%.

Agriculture is the most important sector of the economy, employing over 80% of the work force. The value of annual exports is just under USD500 million. Coffee accounts for the bulk of export revenues. Other export products include fish and fish products, tea, gold and cotton. Uganda has substantial natural resources, including fertile soils, regular rainfall, and sizable mineral deposits of copper and cobalt. Since 1986, the government - with the support of foreign countries and international agencies - has acted to rehabilitate and stabilize the economy by undertaking currency reform, raising producer prices on export crops, increasing prices of petroleum products, and improving civil service wages. During 1990-2001, the economy turned in a solid performance based on continued investment in the rehabilitation of infrastructure, improved incentives for production and exports, reduced inflation, gradually improved domestic security, and the return of exiled Indian-Ugandan entrepreneurs. Corruption within the government and slippage in the government's determination to press reforms raise doubts about the continuation of strong growth. In 2000, Uganda qualified for enhanced Highly Indebted Poor Countries (HIPC) debt relief worth \$1.3 billion and Paris Club debt relief worth \$145 million. These amounts combined with the original HIPC debt relief added up to about \$2 billion. Growth for 2001-02 was solid despite continued decline in the price of coffee,

Uganda's principal export. Solid growth in 2003 reflected an upturn in Uganda's export markets.²

Uganda was recently ranked 48th out of 155 countries in having the best “economic freedom”, according to a 2004 index published by the Economist Intelligence Unit. Comparatively, Kenya ranked 94th and Tanzania ranked 98th. South Africa, the continent's economic powerhouse, ranked 53rd.³

The Uganda Investment Authority (UIA) in the year ending June 30, 2004, licensed 181 investment projects worth approximately USD533 million. Based on the origin of the investment, USD150 million were from Uganda, USD131 million from Kenya, USD105 million from Bermuda, and \$46 million from the US.⁴

Uganda has done remarkably well in getting HIV/AIDS under control. The disease was rampant earlier in the 1990's but during the past few years, thanks primarily to aggressive government-backed public awareness campaigns, the current rate of HIV/AIDS infection is about 5% among the Ugandan population; a rate that most other Sub-Saharan African countries can only dream of.

2. General Market Conditions

2.1 Overall State of Technology

The disastrous regimes of the 1970's and 1980's did grave damage to Ugandan people and the infrastructure of the country. Hence when Yoweri Museveni came to power, the starting point for rebuilding the country was virtually zero. This applies both for the human resource skill base and the condition of the physical infrastructure in Uganda. Prior to 1996, Uganda's communication infrastructure was among the least developed, not only in the world, but also in Africa.⁵

The main problem related to the telecommunications infrastructure is the lack of bandwidth. As Uganda is a landlocked country with no fiber-optic links abroad, the services that require high-capacity telecommunications infrastructure are seriously hampered. International telecommunications traffic, including voice, data, and internet, must be delivered via satellite links. This limits functionality as services that require broadband delivery are not always available as needed, and the prices remain high. However, in general, the Kampala area is well served with modern, digital equipment. In the rest of the country, although roll-outs have been quite aggressive, there are very large gaps in connectivity, which is of considerable importance as the country is very rural. Also, outside the Kampala-Entebbe corridor, the backbone network is primarily based on microwave links.

Domestic: intercity traffic by wire, microwave radio relay, and radiotelephone communication stations, fixed and mobile cellular systems for short-range traffic

² CIA Fact Book 2004.

³ East African Procurement News, Vol. 1 issue 32, July 12-18, 2004

⁴ East African Procurement News, Vol. 1 issue 32, July 12-18, 2004

⁵ Draft National Information and Communication Technology Policy Framework, 2002.

International: satellite earth stations - 1 Intelsat (Atlantic Ocean) and 1 Inmarsat; analog links to Kenya and Tanzania

Radio is an important communication medium in poor and rural societies. In Uganda, radio service extends about 10-20 km away from the main roads.

The Government itself lacks delivery capability for the services it offers to individuals, investors, tourists and corporates. The Government does not possess the necessary infrastructure for delivering services by electronic means. Most ministries do not use e-mail for communication on a large scale although that is fast changing with the deployment of an Integrated Financial Management System (IFMS) in selected ministries.

Most government ministries now have websites, although the information provided is limited to the listing of services and not the services themselves. Because of the limited local area network (LAN) infrastructure internet access at most government ministries and departments is to a limited to a few offices and individuals. Some ministries have addressed this inadequacy by installing shared internet access facilities within resource centers such as the ministry library. For e-government development, several bottlenecks exist: Grid power is available in few rural areas, computing facilities are inadequate, email is not widely used for communications and computers are used for very basic applications. Given the absence of an electronic payment gateway in the country, most banks have until now not issued credit cards and neither are these widely accepted as a method of payment as the credit risk is considered high. As of August 2004 a few banks have started issuing credit and debit cards

2.2 Technology / Internet Penetration Levels and Affordability

The penetration of personal computers (PCs) in the private and public sector is fairly high. All banks have some level of computerization, and most of the large private sector organizations use ICT to support some of their activities. A number of NGOs (in particular the international ones) and international agencies operating in Uganda are reasonably computerized.⁶

Although the level of penetration of computers within the public service is reasonably high, the level of utilization of computers to support organizational activities and operations is still very low. In most cases computers are being used for basic tasks such as word-processing. Few organizations are using their computer systems for high-end value-added applications to improve business processes such as: Management Information Systems (MIS), database management systems, personnel management systems, accounting and budgeting.

There are very few LANs in organizations within the public service, and there are hardly any Wide Area Networks (WANs).

The internet and other forms of information and communications technology are now readily available in Kampala. Limited access to these technologies by medium and lower income populations, in rural areas especially, is widely perceived to be a major impediment to increased economic growth and prosperity in Africa, including Uganda.

⁶ National Information and Communication Technology Policy Framework, 2002.

Broadening equitable access to ICT requires a political commitment from the region's leaders, and Uganda has the human and technical resources to exercise substantial leadership in this arena. There is already a so-called "ICT Big Push Strategy" by the government of Uganda, and under this initiative various efforts are being put in place by different government bodies.

The very nature of ICTs requires that the case for broader access be made at a regional level. The construction of the proposed East African Cooperation (EAC) high capacity digital transmission link will allow this to materialize.

ICT projects, including pilot projects, must be undertaken to develop the application of ICT for development. Most Ugandan ICT projects are currently supported through donor funding, government, parastatal and private institutions. They include:

- The ACACIA telecenter projects at Nakaseke, Buwama and Nabweeru (funded by the International Development Research Center (Canada))
- The Local Government Project in Rakai District (Danish International Development Agency - DANIDA)
- The Information Infrastructure Agenda at the Institute of Computer Science at Makerere University (Infodev).
- The Inter-Ministerial Mapping and Geographic Information System (GIS)
- The Academic Research Network Project
- Creation of an ICT Resource Centre and Internet Café
- Local Area Network and Internet Connectivity Project for the Parliament of Uganda
- Campus Network Project for Makerere University.

The broadband internet connection costs for an SMME (small, medium or micro enterprise) range from USD 200-500 a month and a local leased line costs average USD 200 per month⁷. The cost of broadband at these rates is prohibitively high for many small businesses and hence most of them do not have access to the internet. There are some 100-130 internet cafes in Uganda. They are largely concentrated in the Kampala downtown area. Due to the low average income in the country, using internet cafes in Uganda is very popular among urban professionals. An hour of internet access in a Kampala internet café costs USH 1 800 – 3 200 (about USD1-2). On a subscription basis, connecting to the internet costs a flat fee that ranges from USH 32 000 (USD 20) to USH 80 000 (USD 50) per minute. In addition to this, a subscriber must pay a monthly fee of about USD 30. A report by the Uganda Communications Commission (UCC) (July 2004) indicates that internet tariffs have dropped from USH 4 500 / hour to USH 1 500 / hour with an average subscription rate of between USD 30 – 50 per month.

The UCC reports 7 024 Internet subscribers but the figure is only a wild guess with no valid empirical data to back it up.

The total number of public payphones installed by UTL, MTN and Celtel is 3 661. 1 278 (35%) of these are found in Kampala and its surrounding suburbs.

The penetration of personal computers has been recognized as an effective indicator of the extent of ICT in society. In Uganda the penetration is estimated to be less than 1 PC per 1,000 of the population. In 1999, the estimated stock of PCs in Uganda was 60,000

⁷ Interview with Uganda Communications Commission

and estimated sales of PCs for the same year were 30,000.⁸ If we assume a very conservative annual growth rate of 5% in the sales of PCs, and the removal of 20% (12,000) of the old stock (60,000) annually, then the estimated stock of PCs five years later in 2004 would be 216,000. To encourage ICT growth, the Government of Uganda has scrapped import taxes on computers and other ICT hardware. This has led to a significant increase in the number of computers in the country, mainly in the urban areas.⁹ One of the interesting and unexpected spin-offs has been an increase in tax collection by the Uganda Revenue Authority as a result of better accounting practices by small businesses.¹⁰

For mobile telephony, the current fee to open a connection is approximately USD15 and user charges are about USD 0,18 cents per minute. In 2002, there were reportedly 2 242 Internet hosts in Uganda.

Table 1. Telecommunications Service Provision Indicators for Uganda, 1996 – 2004

Services Provided	1996	1998	1999	7/2000	7/2001	7/2002	6/2003	3/2004
Fixed lines connected	46 000	56 000	58 000	58 000	56 149	54 976	60 995	67 234
National telephone operators	1	2	2	2	2	2	2	2
Mobile subscribers	3 500	40 000	70 000	140 000	276 034	393 310	621 082	872 709
Mobile cellular operators	1	2	2	2	3	3	3	3
ISPs	2	7	9	9	9	17	17	18
Internet/email subscribers (wireless access)				500	5 999 ¹¹	6 500	7 024	
Internet/email subscribers (dial-up)				4 000	6 500			
VSAT international data gateways				4	8	8	8	8
Internet cafes		3	8	14	49			100 - 120 ¹²
Public payphone licenses		7	13	19	49 (combined w/above)			
Paging service providers	2	3	3	3	3	3	3	3
FM radio stations	14	28	37	40	110	115	125	126
Television stations	4	8	11	11	20	22	23	23

Source: Uganda Communications Commission 2002, 2004

⁸ The Internet in an African LDC: Uganda Case Study, ITU, 2001.

⁹ See <http://www.itcltd.com/EDIAS.%20Rona.pdf>

¹⁰ Rogers Baguma, presentation to WITSA, 27 September 2004

¹¹ The Public Pay Communications Network Service license was issued for the provision of fax, payphone, and Internet café services.

¹² Team estimate – UCC quotes that there are over 80 in Kampala July 2004)

2.3 Policy and Regulatory Frameworks

The current status of ICT in Uganda has been influenced by various policies, statutes, laws, acts and regulations, passed and enacted in the past ten years. These have brought about liberalization in various social / economic sectors leading to an impressive economic performance. The more relevant ones are briefly described below:

The Communications Act, 1997

The Telecommunications Policy was enacted in 1996. The main objective behind the policy was to increase the penetration and level of telecommunication services in the country through private sector investment rather than government intervention.

Rural Communications Development Policy, 2001

The main objective of the policy is to provide access to basic communication services within reasonable distance to all people in Uganda.

The Electronic Media Statute, 1996

The Statute created a licensing system, under the Broadcasting Council, for radio and television stations, cinemas, and videotape rental businesses. The purchase, use, and sale of television sets was also to be subject to licensing by the Council.

The legal and regulatory frameworks provided by the Communications Act and the Electronic Media Statute address sectoral concerns to some extent, but there is a need for a comprehensive policy on ICT that takes into account the various sectors. Some initiatives have moved ahead without the framework an ICT policy would have provided, one such example being the UNCITRAL Law for e-commerce. This has been forwarded to the Law Reform Commission by the Uganda Investment Authority (UIA) for adoption into Ugandan Law. This should address the legal loopholes that presently hinder the growth of e-commerce.

2.3.1 National ICT Policy

In recognition of the need to develop appropriate and deliberate policy and strategies to enhance the role of ICT in poverty eradication, the government, through the Uganda National Council for Science and Technology (UNCST) initiated a consultative and participatory process to formulate the national ICT Policy. In 1999, a National ICT Policy Task Force was set up to spearhead and oversee the formulation of an ICT Policy. The Task Force was multi-disciplinary and multi-sectoral in nature, with representatives of all key ICT stakeholders from government, academia, civil society and the private sector. In July 2002, an ICT policy document was published which covers:

- Information as a resource for development;
- Mechanisms for accessing information; and
- ICT as an industry, including e-business, software development and manufacturing.

The ICT policy is likely to lead to a redefinition of other sectoral policies such as the industrial, science and technology and the telecommunications policy.¹³ The Cabinet has recently ratified the ICT policy. The Ugandan government has selected five

¹³ African ICT policy processes African Information and Communications Technology (ICT) policy processes: Combined report to contribute to the CATIA priority country research areas, Sept 2003

institutions to implement the national ICT strategy. The institutions include the Ministry of Works, which is working on e-Governance, the Uganda Investment Authority working on establishment of e-Commerce, Office of the President working on establishing e-Information, e-Education by the Ministry of Education and e-Health by the Ministry of Health.

Some of the key reasons why ICT is considered important by the government, and as stated in the National ICT Policy document:¹⁴

- ICT has a very broad range of applications that span various sectors of health, education, agriculture, e-government, e-commerce, etc.;
- ICT enhances economic growth through making enhanced competitiveness possible, increased trade and investment;
- Creation of opportunities and empowerment by provision of access to local and global markets and promotion of rural development;
- Improved transparency and governance through availability and use of ICT;
- Introduction of new management and control methods in both public and private sectors hence facilitating enterprise resource management; and
- Modernization of private sector through improved market access, sales, trade and knowledge of business trends.

The National ICT policy has identified 14 key objectives, which include improving connectivity and human capacity; sensitizing society about the role of ICT in development; promoting local and foreign direct investments in ICT, working out an enabling legal framework and establishing innovative financial schemes to promote the sector. Other objectives include improving access, encouraging use of ICT to improve efficiency in organisations, enhancing local content and ensuring gender or linguistic equality of opportunity. The ICT policy also aims at ensuring respect for intellectual property, encouraging research in ICT and enhancing collaboration in various fields of ICT.

According to the ICT policy, the mandate to oversee broadcasting technologies falls under the Directorate of Information in the Office of the President; that of IT is under the Ministry of Finance, Planning and Economic Development through Uganda Computer Services (UCS), and that of the postal and telecommunication technologies under the Ministry of Works, Housing and Communications.¹⁵

2.3.2 Regulatory Environment

The Uganda Communications Commission (UCC) was established by the Uganda Communications Act of 1997. UCC's mission is to regulate and facilitate the development of communication services in Uganda. Prior to 1997, there was no separate regulator but the government-owned operator, Uganda Telecommunications Limited (UTL) also acted as the regulator.

¹⁴ National Information and Communication Technology Policy Framework, Draft, May 2002.

¹⁵ UCS Transformation Brief, July 2004.

Major License Services

- Basic Telephony services including local, national and international telephony services
- Cellular Telecommunication Services
- Trunk Capacity Resale services including the provision of leased lines and circuits
- Satellite telecommunications services
- Third Party Private Networks

Minor License Services

- Paging services
- Store and forward messaging services
- Telex services
- Telegraph services
- Value-added services
- The sale, lease and maintenance of subscriber premise wiring and terminal apparatus
- Private telecommunications services

The telecommunications sector was partially liberalized in 1998, when entry of new firms was allowed except for protected services which included cellular telephony, satellite communications, and international voice services. At that time, six VSAT licenses had already been issued.

Celtel started cellular service in 1995, the first in Uganda. The company is owned by Mobile Systems International (MSI) of the Netherlands (recently renamed Celtel International) with shareholders including the International Finance Corporation (IFC). UTL also has its mobile telephony operations, and in 1998, mobile operator MTN started operations. In 2000, MTN was granted the second national operator (SNO) status, which means that MTN is required to cover all Uganda's districts and county headquarters in exchange for the right to deliver all telecommunications services in the country. Hence, in July 2000, a duopoly began in Ugandan telecommunications service provision for a period of five years.

By all accounts, the duopoly has had mixed reviews and varied opinion as far as its impact on competition and pricing is concerned. Competition did not materialize in basic telephony, prices remained high, and it has generally stifled new activities in the market. Small operators have felt marginalized by the unintended duopoly in, for instance, the data market sector. The UCC on the other hand, has been reluctant to wield a strong supervisory hand in checking duopolistic anti-competitive practices. ICT entrepreneurs have been opportunistic in exploiting the situation where anyone can apply for licenses for the provision of internet or data services. There is, however, a restriction on external data circuits using VSAT technology and that is seen to a bottleneck to growth. To set up wireless networks, a spectrum license is needed. VoIP is another service that is contentious and one whose boundaries of legality are not well defined. According to UCC regulations, telephony and any form of publicly switched voice service falls under the duopoly of Uganda Telcom and MTN. This however does not affect the provision and use of VoIP services within a private network.

The duopoly on the provision of what are called core services of switched voice and other protected services is scheduled to expire in July 2005, and the UCC is currently reviewing the ICT policy by consulting local stakeholders such as the operators and government agencies. Small operators such as ISPs have criticized the review as too narrow and not open enough to permit competition across more segments of the telecommunication services sector such as VoIP. However, the expectation is that the duopoly will not be extended beyond that date although there is no clarity on how the sector will be regulated thereafter.

UCC's consultative process has highlighted the need to be cognizant of the market size for any future licensing of new operators.

2.3.3 Rural Telecommunications Development Policy and Universal Service Obligations

UCC has the responsibility of developing the rural telecommunications environment. It adopted the Rural Communications Development Policy in July 2001. The purpose of the policy is to support the development of communications infrastructure in rural Uganda and to ensure that people in rural areas have reasonable and affordable access to communications services. In practice, the policy calls for

- Bringing access to basic communications to all sub-county levels in Uganda, or to every community that has a population of at least 5,000 inhabitants, by year 2005;
- Ensuring effective utilization of the Rural Communication Development Fund (RCDF);
- Promoting Information and Communication Technologies use in Uganda; and
- Promoting communications in rural areas as a profitable business

Operators have been required, directly through their license rollout obligations, to attend to rural communication development. UCC has set up and manages the Rural Communications Development Fund (RCDF), now in its second year of operation. The fund is being used to leverage investment in rural communications through competitive private sector bidding. Several disbursements have already been made. The fund is comprised of two components:

- a) Start-Up Project – to provide subsidy financing from the accumulated contribution of 1% service levies on the turnover of the communication service providers;
- b) World Bank credit of USD 5 million for the ICT component under the Energy for Rural Transformation (ERT) Project.

The UCC also attempts to encourage:

- Policy conducive to rural telecommunications development;
- Technology choices appropriate for rural areas;
- Models for serving rural and isolated communities; and
- Financial tools for rural telecommunications development and expansion.

Some more specific objectives of the policy are to ensure that all sub-counties with at least 5 000 inhabitants have access to basic communication services (as mentioned above) and to support the establishment of an Internet Point of Presence (POP) in every district in Uganda by 2003. This has been only partially successful because of limited usage.

Some government ICT related policies have so far been highly successful. The telecom policy has been a success and has resulted in major improvements in the availability of mobile services in many parts of the country. The result has been increased competition, better quality services and lower calling rates. This is good news for Ugandans as cross-country evidence strongly suggests that well-regulated economies with a competitive climate for cultivating an information infrastructure beget lower costs, better service, wider access, and greater diffusion of telecommunications and Internet services.¹⁶

2.4 Government Initiatives

The Government has long considered ICT as one of the key sectors that has the potential to ensure rapid development of the country.

2.4.1 Telecommunications Infrastructure

The UCC has proposed that the government should invest in the backbone infrastructure. It has recommended the laying of fiber-optic cable along the roadsides to relieve the acute shortage of bandwidth. The funding source would be the RCDF, which receives a mandatory 1% of revenue from licensed operators.

For implementing e-government on a large scale, the creation of a Metropolitan Area Network on a wireless backbone has been suggested. This will deliver high-speed connectivity using WiFi technologies, which can provide broadband connectivity over radio links and effectively delivers a combination of a local area network (LAN) and an Intercom system.

There are a number of projects that have been proposed to upgrade the national communications infrastructure to remove bottlenecks that are standing in the way to gaining the full advantage of ICT. These include constructing fiber optic rings in Kampala by MTN/UTL, and setting up Internet POPs, rural telecenters, and more rural payphones by UCC/RCDF.

As in Kenya and Tanzania, the SAFE submarine cable extension to Djibouti along the African coast is a daily topic in Uganda. It is seen as critical for providing sufficient bandwidth in the long term at reasonable cost. Uganda could link to the submarine cable either by the way of Kenya or Tanzania, both of which are planning landing points for the cable. Dar-es-Salaam is being connected by terrestrial fiber-optic links to South Africa using the Tazara railway line, as well as the proposed submarine cable system. In Kenya, there are plans by the Kenya Pipeline Corporation (KPC) to lay fiber next to the pipeline from Mombasa, the foreseen future landing point, to Nairobi. The expectation is that these fiber-cable initiatives will extend to Uganda in due course.

2.4.2 Government IT Services

Uganda Computer Services (UCS), within the Ministry of Finance, Planning and Economic Development, is the Government entity responsible for developing and running ICT systems within the Government. The UCS currently maintains both the Accounting and the Payroll System. About 30 000 transactions are processed per month, while the payroll system issues 215 000 payslips.¹⁷ Historically there has been a

¹⁶ The World Bank, Information and Communications Technologies in East Asia's Future Growth, 2002

¹⁷ UCS Transformation Brief, July 2004

lack of coordination and standardization, and absence of clear objectives, regarding the development of ICT systems within the Government. Different ministries and agencies have been free to implement their own systems without regard for what the others have been doing. The result has been a collection of disparate and incompatible information systems.

It has been proposed that UCS transform into the National Information Technology Authority - Uganda (NITA-U). The proposed objectives for NITA include the development and initiation of ICT strategies and master plans for the Government, coordination and monitoring of ICT initiatives within the Government, and providing first-level technical support for government IT systems. The transformation process should be completed within a three-year period including enacting the legislation. A draft bill is due for submission to the Cabinet. New building is expected to be ready in June 2005. Proposed integrated systems in which NITA will be involved include the:

- Integrated Financial Management System (IFMS);
- Integrated Personnel and Payroll System (IPPS);
- Integrated Resource Management Information System (IRMIS) for the Ministry of Defence; and
- Electronic Funds Transfer (EFT).

As the private sector is very small in Uganda, the importance of the government's actions in the ICT arena is significant. The Uganda Investment Authority (UIA), the Uganda Council for Science and Technology, and the Institute of Computer Science at Makerere University are also involved in IT development in the country.

Although e-government initiatives have been slow coming, there are plans to implement e-services. A proposed timetable for a detailed work is as follows:

System study	December 2004
Design and development of delivery architecture	June 2005
Applications development	June 2006
Process re-structuring	June 2006

One of the goals of the e-government strategy is to have a telecenter or kiosk in every sub-county or at least a cluster of nearby sub-counties. These telecenters could be simple stand-alone PCs or a battery-powered laptop computer and a telephone line. The telecenter should have the capability to provide online services to citizens wishing to access government services. Recently the USD500 license fee required by communications service providers e.g. telecenters, fax bureaux, cybercafés was waived to make ICT more accessible to all Ugandans.¹⁸ Similarly, a license fee for ISP services was also recently abolished.

Most of the ICT capacity building has been ad-hoc and every ministry and local government body has been doing its own thing. Planning for compatibility or common standards across systems even within the same ministry has not been done.

¹⁸ <http://africa.rights.apc.org/news-content.shtml?x=9835>

2.4.3 Industrial Trade Zones and Incubators

The Uganda Investment Agency (UIA) has completed feasibility studies in three areas to encourage foreign investment in ICT and ICT enabled services: call centers, data centers, and e-translation. UIA is also pursuing Ugandans living abroad, particularly in the Boston area in the US, and in the UK, to outsource services from Uganda.

The UIA is in the process of establishing a major industrial free trade zone 12 km east of Kampala, which is to be managed by a private company. The intention is to draw foreign investment to the area, which consists of 1000 hectares and will have the best infrastructure in the country. Some 100 companies have expressed interest in locating in the zone, including Coca Cola and National Tobacco Leaf. The intention is to establish another free trade zone at Entebbe, as well as to designate several locations as Export Processing Zones (EPZ).

Uganda is setting up a USD600 000 ICT incubation centre to help ICT businesses seek markets. UIA has carried out a study and concluded that the incubation centre would help those involved in ICT businesses to penetrate regional and international markets. The UIA is currently expecting to get the first disbursement for the project but there have been delays.

2.5 Industry Capabilities

The Ugandan market is very small and the capability pool should be viewed in that perspective. There is no available data on the size and nature of the industry, although UNCTAD is intending to survey the software industry. The report should be complete by the end of 2004. E-readiness studies have also been carried out by the Ministry of Telecommunications.

Ugandan ICT entrepreneurs and managers are well educated and they apply creative approaches in an immature market. The general technical skills that companies need are fairly well available but usually significant on-the-job training is required to make employees fully productive. However, this does not appear to be a problem and companies are willing and prepared to do significant training in-house.

A major constraint to develop capabilities at firm level is the lack of capital. It is very difficult for small Ugandan ICT businesses to obtain the financing that is needed for expansion to take the company to the next level. The industry is also not well organized, which inhibits its voice being heard within policy-making circles.

Efforts are underway to strengthen the ICT sector by becoming more organized and strategically inclined. Several industry associations have been formed –The Private Sector ICT Association (PICTA), whose aims and goals are to create a forum for constructive dialogue with government and attempt to influence policy input for fair taxation and fair play in government processes. The USAID funded IT Mentors Alliance is working with PICTA to develop more capacity in lobbying and advocacy. This is being done under the auspices of the World IT and Services Association (WITSA).

The Uganda Software Services Association (USSA) was recently established with a specific focus on promoting software development and services in Uganda. USSA has advocacy and advisory functions and it intends to disseminate information to its members about policies, markets, and other relevant issues.

The Private Sector Foundation Uganda (PSFU) is an umbrella private sector body with about 64 business associations and corporate members. Its focus is on policy advocacy and building competitive capacity for partners. It is working with the government on various export strategies and pilot studies in two focus areas: agriculture (specific crops such as cotton, coffee, tea, horticulture, cocoa, livestock, fish, etc) and ICTs.

AITEC Uganda is not strictly an industry association but it plays a key role in the organization of conferences and exhibitions. More recently it is playing a role in the establishment of rural telecenters in Eastern Uganda in the Mayuge District. It is also responsible for running I-Network, an IICD initiative to promote advocacy in the industry and with other stakeholder groups on a monthly basis.

While the telecommunications sector is tightly regulated, the software/ICT sector is not. The ICT sector as a whole consists of several small or very small companies and a few larger companies. In the Ugandan context, any company with more than 50 employees would be classified as large.

2.6 Obstacles to Growth

The main obstacle to growth for technology companies is the difficulty of obtaining funding for investments. The ICT infrastructure is very costly and the size of the market that will initially carry those investments is small. The digital divide is real in Uganda, not just among the haves and have-nots among the population, but also within cities, organizations and the Government itself. Therefore, ICT knowledge and awareness in the society is low, and in many rural areas practically non-existent.

The basic telecommunications infrastructure does not meet modern requirements. There is a serious lack of bandwidth, which keeps prices of various services high, internationally speaking. The costs are further exacerbated by the lack of competition. The high cost makes many types of services directed to serving export markets unviable.

Only about 50% of the geographical area is currently covered. The entire northern region, except for a few towns, is unconnected. Combined teledensity (fixed + mobile) is still less than 3 per 100 individuals. As only 2% of rural households (and roughly 4.3% of all households) are connected to the electric grid, it is easy to realize that rural internet connectivity cannot be implemented primarily by connecting households directly to the internet. Various intermediaries, such as community centers, schools, post offices and the like must be used. Power supply is erratic in many parts of the country and stabilizers and UPS are essential components of the ICT infrastructure.

Kampala and surrounding areas account for over 80% of fixed line and mobile telephone connections and 90% of Internet connections. The use of mobile phones has spread very rapidly in Uganda. Now the main obstacle for further penetration is the price of a handset and the SIM card. Refurbished handsets can be purchased at about \$35. To mitigate the problem, MTN, together with Grameen Bank, started a Village Fund about six months ago. Under the scheme, approximately 650 mobile phones have been given to elected representatives in villages, and villagers can use these phones as needed by paying for the cost of the call. The debt pay-off period is three years.

No PKI or payment infrastructure is available; and no secured servers for electronic transactions exist within the country

A typical infrastructure that needs to be developed would include fiber optic links between major cities and with neighboring countries, high bandwidth up and down links, etc.

As for the people's personal ICT usage, the price of computers and connectivity is a major hurdle. If the GDP per capita is around USD400, and the cost of a computer and an annual connectivity fee is about the same, it is clear that wide penetration of technology can only be achieved by bringing technology and connectivity to places where the whole community can access it.

2.7 Human Resources / ICT Education

Although there has not been a comprehensive survey of human resources in ICT in Uganda, it is safe to say that the need for at least some ICT skills exceeds the current supply. The needs are only partially met by the existing training institutions and the existing ICT capabilities should be assessed and reviewed on a national basis to obtain a complete picture of the needs in the country. However, the ICT skills that will be needed, and therefore the kind of training that will be required, depend very much on the ICT policy Uganda adopts.

Uganda has a large English speaking population. Education is by and large highly rated in the country, and the literacy rate is about 70%. Almost 100% of children attend primary school (7.5 million). 640,000 students attend secondary school and there are over 50,000 tertiary education students in 16 universities/colleges in the country, a third of which are government funded.

Most institutions of higher learning, both private and public, offer varying levels of ICT skills training, mostly as part of their programs for formal academic qualifications. At Makerere University, the Institute of Computer Science provides academic training in the field of computer science to Computer Science specialist students. Most other departments have incorporated ICT training in their curricula. However, in many cases facilities are not adequate to provide the required exposure; for example the number of computers is not enough to provide students with adequate hands-on practice. A Directorate for ICT has been set up to coordinate ICT training at the university. The University is also part of the African Virtual University program, which offers teleconferencing facilities for distance education. The Global Distance Learning Centre at the Uganda Management Institute hosts similar facilities. Other Institutions of higher learning with similar training programmes include the Islamic University in Uganda, Mbarara University of Science and Technology, Kyambogo University, Uganda Communications Institute, Uganda Management Institute, and Uganda Martyrs University.

ICT-related training in Uganda is considered to be of reasonably high quality. Makerere University has a Department of Electrical Engineering that will produce about 80 graduates with Bachelor's degrees in 2004. The Institute of Computer Science produces about 200 graduates this year and there are approximately 100 graduates in business computing in 2004. Kyambogo University offers a Bachelor's program in telecommunications. Makerere University too is introducing a private Bachelor's program in telecommunications. Universities in Uganda train students in theoretical concepts; this needs to be supplemented with a significant period of on-the-job training in specific priority areas such as software development, network management, and so forth. Although the level of technical ICT skills is quite good, there is a shortage of skilled and

experienced business managers in the ICT sector. In other words, to put ideas into practice and to apply technical skills in a business context is hampered by the lack of management experience and talent.

Training in the fields of ICT through private institutions is available in Kampala and to a certain extent in other towns. Most training institutions are reasonably well equipped and the faculties are considered knowledgeable and up-to-date with the latest trends in ICT. However, the courses themselves are of widely varying duration and content, making it impossible to judge the competence of graduates from these institutions. There is a need to standardise these short ICT courses so that the market can assess the true ICT skills capabilities. The Uganda Institute of ICT also offers ICT training. There are five private Cisco Academies in Uganda.

One of the concerns from Web developers is that not enough skills are developed that combine fine art skills with programming, as this is the skills base required by the content industry.

The ICT content in teacher training is inadequate. Even in schools with computers, the level of use is mainly for applications software such as word processors and not related to the curriculum. A serious attempt must be made to sensitize teachers and school administrators to the uses of ICT in enhancing education.

The Uganda Institute of Information and Communications Technology (UICT) was established by UCC. The Institute provides education and training in all fields relating to the communications sector, including postal, management, telecommunication, electronics and computer engineering. UICT is mandated to be the leading communications training center in the country, offering quality, customer driven and cost effective training, research and consultancy in the communications and related fields.

In developing countries in general, and Uganda is no exception, the majority of ICT users are from the most educated part of the population. This means they reap the benefits and economic opportunities while the uneducated are excluded.¹⁹ It also means that a special effort must be undertaken to bring ICT to the poor. To be able to fully benefit from ICT, there has to be a solid pool of skilled workers. The Ministry of Education and Sports has approved a curriculum for ICT Training for secondary schools, and a limited number of schools are offering ICT Training. These schools are being equipped under various programs, including the SchoolNet and ConnectEd Projects. Only a very small percentage of secondary schools are offering such Training, and in almost all cases the facilities are inadequate for reasonable hands-on experience.

2.8 Competition

2.8.1 Telecommunications

Two national operators have been licensed, Uganda Telecom Limited (UTL) and MTN Uganda Limited. They are licensed to provide a full range of communications services (major license services and minor license services). An exclusivity period was granted to these two national telecom operators in which the provision of what is termed as protected telephony service was restricted to these operators and those other service providers licensed prior to the beginning of the exclusivity period to provide the same

¹⁹ Contribution of Information and Communication Technologies to Growth, Christine Zhen-Wei Qiang and Alexander Pitt, The World Bank, 2004

services. The protected telephony service consists of basic telephony service (real time voice communications including voice over internet protocol - VoIP), cellular telecommunications service and satellite service. The exclusivity period runs for five years and it ends on 25th July 2005.

Due to the duopoly, prices have remained high, and there are accusations of collusion in data transport between UTL and MTN.

As many Ugandan operators are at least partially owned by foreign companies, there is both domestic and international competition. This applies to mobile wireless and fixed line services, as well as ISPs and satellite-based services.

2.8.2 Information Technology (Hardware and Software)

The market for software is not regulated. The lack of specific rules for small ICT companies has resulted in many of them not being able to compete successfully in government IT procurement tenders. Competition from international players is aggressive and it appears that the SMMEs that are forming partnerships with international partners are the only ones able to compete successfully in the open market. Special measures may be needed to encourage more local participation in the provision of ICT services to government – this may stimulate growth of this part of the sector.

2.9 Capital and Financing

The Ugandan shilling is a fully convertible currency. The exchange rate is approximately 1,800 shillings to one US dollar. Inflation in Uganda has been brought down to about 3.5%, thanks to sound fiscal policies practised by the government. There are no restrictions for repatriating profits earned in Uganda by foreign companies.

The biggest problem for entrepreneurs in Uganda is the difficulty to obtain financing for expansion. The banks require full collateral, or even 110%, in the form of real estate assets or deposited funds at the bank. Banks do not generally loan against receivables. In other words, if an entrepreneur presents signed customer contracts as proof of future cash flows, banks do not recognize this. A well-established entrepreneur offered as an example that he purchased several neighboring properties to his current business, to use the properties as collateral when applying for bank loans.

The current interest rate for corporate loans is 14-15%. Most banks do not provide long-term financing; usually loans are for less than three years. Hence no real project-financing is available. A one-year deposit earns about 16% for the depositor. There are fifteen banks operating in Uganda, of which three are foreign banks (Barclays/UK, Stanbic/RSA, Standard Chartered Bank/RSA).

There is also practically no venture capital market in Uganda. Start-up entrepreneurs are dependent on their own savings and loans from friends and family to get business off the ground.

Due to large-scale office construction projects underway in Kampala, the office rents in premium downtown locations are experiencing a downward trend. Mortgage financing is also uncommon in Uganda; currently there are only a couple of banks offering mortgage financing.²⁰

²⁰ Interviews

The Uganda Stock Exchange has five companies listed, three of which are Ugandan companies and two of which are Kenyan. It is an immature exchange with small market capitalization, and in the small Ugandan market does not guarantee liquidity of investment. Therefore, it is currently not a feasible vehicle for raising funds for up and coming companies.

Some entrepreneurs do not fully trust the banks. In the interviews there were claims that some banks had taken people's business plans, which had been a part of loan applications and then used the business plans for their own purposes.

Foreign investors require a minimum investment of USD100 000 in order to secure an investment license from the Uganda Investment Authority. The investor must register a company in Uganda at the Registrar General's office, and obtain a Memorandum and Articles of Association, and a Certificate of Incorporation. After obtaining the documents, the investor needs to apply for an investment license from the UIA. In addition to the above-mentioned documents, the application must be supported by a business plan.

Most of the funds for ICT for development projects come from multilateral and bilateral donors e.g. DANIDA, IDRC, DFID, IICD and others.

3. Review of Seven Primary Segments

3.1 Infrastructure

Until 1994, all telecommunications services were provided by the Uganda Posts and Telecommunications Corporation (UPTC). Since then, the telecommunications sector has been progressively liberalized. Two fixed line telephone network operators and three mobile telecommunication network operators have been licensed. Uganda Telecom Ltd. (UTL) and MTN Uganda Ltd. are the two operators with a national operator status.

Uganda Telecom Limited (UTL) took over the telecommunication services of the former government owned Uganda Posts and Telecommunications Corporation (UPTC) which, until 1995 was the only major telecom operator in Uganda. UTL was incorporated in 1998 and is the incumbent operator. In 2000, it was partially privatized when 51% of the shares were sold to a consortium comprising Telecel (Switzerland), Detecon (a subsidiary of Deutsche Telecom of Germany) and Orascom (Egypt). Orascom has since sold its shares to Telecel. The third major operator is Celtel Uganda Ltd.

UTL provides fixed line and mobile wireless telecommunications services. It has the largest fixed line infrastructure in Uganda. However, according to some estimates, less than half of them work. UTL's high-speed data network, which uses xDSL technology over copper pairs, is used for voice, data, and video transmission. There are 19 data nodes installed across the country. UTL provides the backbone infrastructure that supports dial-up Internet access in Uganda. Broadband internet is also available. UTL's mobile wireless business is branded Mango. The airtime is distributed through company stores and a network of resellers that includes gas stations, grocery stores, and other shops.

MTN, which was granted the second national operator's license in October 1998,²¹ offers mobile wireless and fixed line services. Value-added services include roaming, voice mail, short mail, fax mail, and SMS. The fixed line services have been directed mostly to the corporate segment. The fixed line network utilizes a radio-based wireless local loop technology. In 2000, MTN started building a fiber-to-the-door/building network. It uses point-to-point microwave radio to provide an ISDN primary rate wireless interface to buildings and businesses.²² MTN's backbone has mostly been completed and the installation of access rings is ongoing. It is also mainly based on SDH microwave links but is more modern than that of UTL's. Currently, MTN is also installing a CDMA-based network in Western Uganda, which will include a full ring for redundancy. MTN Publicom has been mandated by MTN's operator license to install at least 2 000 payphones by 2005. Currently, over 2 500 have been installed. Of the 56 district capitals in Uganda, MTN's network covers 39. The distribution is done through 30 different resellers, but the overwhelming majority of sales are generated by Simba Telecom, an independent reseller. Uganda Post outlets also distribute MTN's services. MTN is owned by Mobile Telephone Networks (50%, South Africa), Telia (30%, Sweden), Invesco (10%, Uganda), and Tristar (10%, Rwanda).

Celtel is the third mobile wireless operator in Uganda. It started operations in 1995 with a focus on the corporate market when it launched Uganda's first mobile cellular service using the GSM digital system. Celtel's distribution network also includes company stores and smaller independent resellers.

The installed capacity of UTL's fixed lines is approximately 500,000; MTN has a similar installed capacity. These estimates are constantly in flux as both operators deploy new technologies and roll out their networks using CDMA, GSM and fiber-optic backbones.

The wireless infrastructure has been the center of development and most entrepreneurial activity currently ongoing is taking advantage of new developments in wireless technology. It is common that all three mobile wireless operators install their own towers instead of sharing a tower where each would install their equipment. However, two years ago MTN started selling space in their masts to the other two operators.

Another possibility is to use the electric grid for providing broadband access. It is copper based, so bandwidths are considerably less than fiber, but it offers a big advantage in terms of start-up costs and time. In case all initiatives fail, Ugandan companies together (MTN, UTL, Celtel / Infocom and the ISPs) could buy 155 Mbps transponders on any number of satellites that have a footprint across the whole of Africa. It will be considerably more expensive than a fiber cable but still a possible solution.

There are efforts underway to examine how Uganda could participate in and utilize the submarine cable that is being planned for the East African coast, and how the region could cooperate to bring the plan into reality.

Local area networks (LANs) are quite widely used in organizations although there are still ample growth opportunities, particularly in schools and smaller enterprise segment. LANs tend to exist in office environments with more than 15 computers. Wide area networks (WANs) are not nearly as common. Most banks have a WAN but within the

²² The Internet in an African LDC: Uganda Case Study, ITU, 2001.

government they are still rare. The largest corporates usually have WANs. Based on some estimates, there are a few dozen WANs in Uganda. InfoTech Ltd, an IBM partner, and therefore part of its worldwide network, is presently setting up LANs for the judiciary system.

As for the development approach worldwide, railways and electricity transmission companies utilize their right of way and infrastructure (towers) to provide connectivity (e.g. fiber optic cables). These are the kinds of innovative uses that the country must put its existing infrastructure to. Improving bandwidth within towns, within the country and connecting to the worldwide submarine cables is priority number one. A major investment by the Government in building a fiber backbone is required to achieve this.

3.2 Internet Access

18 ISP licenses have been granted and currently there are nine actively operating ISPs in Uganda. These are Infocom, Afsat, One2Net, Dehezi, SpaceNet, Bushnet, Africa Online, MTN, and UTL. Due to the relatively high cost of bandwidth that the ISPs must buy from UTL, the ISP business is not currently considered financially attractive. Many of the ISPs use VSAT technology to reach their customers in remote locations.

ISPs are not allowed to provide Voice over IP (VoIP) services. VoIP is not illegal per se, but ISPs are not allowed to provide voice services. The issue should go away in July 2005. ISPs are allowed to have their own international connectivity provided they have obtained the proper license. All major ISPs have their own international connectivity via VSAT. The other ISPs lease capacity from them or the telecom operators.

Six of the 18 licensed ISPs are in operation. One2Net provides dial up (56k), ISDN (64k to 128k), wireless (16k to 128k), and a leased line (64K to 2Mbps) connectivity with associated value added services such as easymail, web hosting, mail server configuration, etc. It also provides file transfer, web design and web hosting services. They have a bundled co-branded internet service with MTN, which has 400 customers. They are actively looking at new wireless technologies (primarily DAB broadcast technology) to provide domestic broadband Internet services more efficiently. The capital required for the implementation is USD100 000 - 200 000. One2Net has a staff of 26 people and customer base consists of both organizations and individuals.

AFSAT Communications, originally a VSAT operator, has a presence in 18 African countries including Uganda, Nigeria, Tanzania, Mauritius, Ivory Coast, Ghana, Cameroon, Angola, DRC, Burundi, and Somalia. It provides Internet access via VSAT primarily to corporate customers. It operates 200 VSATs in Uganda out of a total 1 000 in Africa. About 15% of its revenue is derived from data services.

Bushnet, established in 1996, grew its business out of the high-frequency radio system used by FAO, and is now focusing on IP-based wireless transport. Bushnet, which cooperates with MTN Uganda in the provision of infrastructure; it now considers itself an IT company and an ISP serving mainly the corporate market. It has roughly 40 employees of which 30 are based in Uganda. It is owned by four partners and company employees. Bushnet is intending to expand its connectivity in Uganda.

Virtual Private Networks (VPNs) have been installed at a few corporate entities.

3.3 Software and ICT Services

There are a number of companies which provide systems integration solutions, IT consulting, and training. These include Impala Soft, Digital Solutions, Crystal Clear, Metrokomya. Estimates from the Uganda Software Services Alliance (USSA) are that there are about 15 – 20 software companies, with the spread as follows:

- Companies with staff > 50 0
- Companies with staff of 10 – 20 2
- Company size < 10 15 - 18

Estimates are that 50 – 70 % of all software development derives from either government contracts or from donors.

The market is not mature and only the large companies can use integrated solutions and possibly small inventory systems. Small companies tend to look for Web solutions, intranet applications and small databases (generally costing < USD 5 000 to develop).

3.3.1 Website Development

About ten companies do website design and development. Web-centered firms include Uganda Home Pages, Metrokomya (Denmark), UBIN, and Computer Frontiers International. As in many other fields, their main target market is government. The market is just maturing and it has not been ready for sophisticated web pages until recently. There is a shortage of competent people and much in-house training is required. Other types of software development are very limited in scope, and there are perhaps 20 software companies in Uganda. The largest companies usually have IT expertise in-house and they use outside IT skills only very selectively.

Uganda Home Pages is the pioneer and the largest web development and design firm with eight full time staff. It provides web publishing, hosting, consulting, and bid document validation services, and is also active in technology advocacy. Its main target market is government and the immaturity of the market and its small size has held.

Computer Frontiers International (CFI) provides web solutions and enterprise IT solutions, VoIP telephony, and call centre services. It is also responsible for domain name registrations (currently about 3 000) in Uganda. CFI develops online applications such as systems portals. CFI is involved in several regional health case-related ICT projects, including the Malaria Network (Uganda), Public Health Network (Kenya, Tanzania, Uganda), and Africa HealthNet (Sub-Saharan Africa).

Uganda Business Information Network (UBIN) began as a UNIDO technology project in 1999. UBIN provides web solutions, database development, intranet and extranet development, and computer training services. It is currently owned by the Uganda Investment Authority (UIA) and the Coffee Development Authority and serves mainly SMMEs. It is planning to set up a call center operation.

Uganda is in the process of establishing the Uganda Development Gateway (UDG) as part of the World Bank Development Gateway initiative. The intention is to develop relevant content and to work through Community-based Organizations (CBOs) and Non-Governmental Organizations (NGOs), using various media including print, radio and the internet.

3.3.2 Software Applications

System developers based at the Makerere University have separately developed software applications for the local market. One developed accounting software for small businesses, and the other one developed a billing system for cyber cafes, which has also been exported to some other African countries.²³ These applications were developed quite some time ago but they are still cited in interviews as the primary examples of Ugandan software development efforts.

Digital Solutions has developed a call centre management system as well as software for use in cybercafés called Chrysalis – it includes a billing and metering system. The product has been in existence for about four years.

Crystal Clear Ltd has developed loan performer software that has been exported to 23 countries in Europe, Africa and the Caribbean.

Rank Consulting is developing photo-based databases for the electoral register, as well as providing accounting solutions to the Ministry of Finance. Most of its applications are in accounting software.

IT solutions provide a wide range of solutions ranging from networking, LANs and WANs as well as software development and consulting. Both Microsoft and OSS are supported.

3.3.3 Open Source Software (OSS)

Most of the market for open source software (OSS) solutions is in the donor community and on donor-supported projects such as Schoolnet. Open source software is not specifically addressed in the existing ICT policy but there is interest from government in exploring its potential. Open source is being promoted by the Linux User Group in Uganda (LUG). The Translation Project, an international voluntary organization, has worked on Lugandan and Swahili translations using the Mozilla browser.²⁴

3.4 Enabling Technologies and Solutions

The market for enabling technologies and solutions, which include ERP and CRM systems, and supply chain and payment solutions, is very immature and small. RPC Data, among some others, has implemented Oracle ERP applications in Uganda. Caltex, Hema Cement, and the World Bank have implemented an ERP system by SAP. Stanbic Bank, the Central Bank of Uganda, and the Ministry of Finance have implemented Oracle financial systems, and Shell and the National Social Security Fund (NSSF) have implemented an ERP system by J.D. Edwards. Roofings Ltd has installed a USD1 million ERP system to manage its distributorships. Simba Telecom is in the process of rolling out an ERP system. Local human resources in this arena are almost non-existent. When RPC Data has done ERP implementations in Uganda it has brought people in from Mauritius and South Africa to do the work. CRM systems are even harder to find.

²³ National Information and Communication Technology Policy Framework 2002 and team interviews.

²⁴ http://www.kizito.uklinux.net/en_index.html

3.5 ICT Enabled Services

ICT enabled services (ITES) involve back-office functions and non-critical tasks that are outsourced to offer cost-effective services to customers. They take advantage of cheap connectivity in the industrialized countries and low cost skills in developing countries. ITES covers call centers, accounting services, insurance claims processing, e-mail responses and so on.

One of the challenges Uganda has to overcome relates to ICT tradition. Uganda is not perceived to be a destination of choice for investment in high-tech industries. This deficiency needs to be substantially mitigated by a strong marketing campaign toward the investment community at the right time. It is questionable whether the time has yet arrived to make a strong case. However, it is critical that various government departments work seamlessly toward that goal and that the coordinator of the effort, the Uganda Investment Agency (UIA) has the plans, skills, and organization in place.

3.5.1 Call Centres

There are only a few very small call center operations in Uganda, which are primarily for supporting an organization's own business such as customer help lines. To set up a call center, one needs to buy a link from UTL or MTN, and so far, the economics have not been there. Cayman Consult has a data entry operation with about 40 seats serving Canadian companies – it has been in operation for less than two years. Informa Corporation Uganda Ltd carries out data entry and archiving services. UTL has a help desk/call centre with about 60 seats. As discussed in the confidential report there are other companies planning to set up call centre operations.

3.5.2 Banking

The banking sector has recently taken off in Uganda and in June 2004 a banking switch in Uganda, of which UTL is a part owner, started operations. The banking sector has started rolling out ATM networks quite aggressively and there are now about 100 ATMs in Uganda, most of which are provided by NCR. This promises significant benefits to consumers as making payments manually often takes a lot of time and effort. For instance, school fees need to be paid four times a year, and people frequently spend the whole day lining up to pay the fee physically on site. Making this payment service available through ATMs can save people four full working days per year and allow them to spend their time more productively.

3.6 ICT Distribution

There is no domestic production of computers and very limited assembly. The largest ICT companies, including distribution/sales in Uganda, are very small. Computer Point is the largest computer hardware and software seller with approximately 50 employees. Simba Telecom is the biggest mobile phone dealer in East Africa with over 100 retail outlets dealing mainly in distribution of air time cards, service fee cards, starter packs, mobile phones and accessories. In addition to Uganda, it operates in Kenya (2nd largest distributor) and Tanzania and has a combined revenue of about USD90 million. It has a staff of 420 people. Simba is operating as the main dealer for MTN in Uganda, Safaricom in Kenya and Vodacom in Tanzania.

Computer Point is the largest ICT hardware distributor in Uganda. Their focus is on the corporate market place and they provide various enterprise level solutions including data

replication and disaster recovery; LANs, Wireless LANID Cards & Access ControlWAN, VPN, VoIP Network Security and Audits. Computer Point has perhaps the largest staff of higher-end ICT skills in Uganda. It is particularly strong in HP/Compaq Storage Area Network (SAN) expertise and provides technical support services to Compaq, IBM, Siemens, NCR, Epson, APC and HP products in the region.

The government has been proactive in providing for a zero tariff rating on all imported software and computers, but this does not include telecommunication equipment. This has been in place for almost two years. The average lead-time for importing ICT equipment is up to eight weeks, mainly because of lengthy and paper-based customs clearance procedures.

Companies can also donate their computer hardware to schools after three years and take advantage of the write-off benefits. A study is currently underway in Uganda, Kenya and Rwanda to determine the likely effects of the WTO Information Technology Agreement on these countries. This may have a direct impact on future zero ratings on a wide variety of ICT equipment.²⁵ Signing of the agreement may lead to further inclusion of a wider range of ICT equipment. This may, as in other countries, lead to a stimulation of this part of the ICT sector.

3.7 E-Government Initiatives and Modernization

The Government itself lacks sufficient delivery capability for the services it offers to individuals, investors, tourists and corporates. The Government of Uganda is, as part of implementing the National ICT Policy, in the process of conducting a feasibility study for an integrated information and communication technology network for government-related functions (e-government) in Uganda.²⁶ The recently announced study is funded with a USD 318 000 grant from the US Trade and Development Agency. The study will review key ministries' requirements, develop action plans for implementation and assist in developing a set of national standards and the architecture necessary for e-government programs in Uganda.

Although not designed directly to be a part of the e-government system, the United Nations High Commissioner for Refugees (UNHCR) recently announced the development of a system registering all refugees in Uganda using a computerized database.²⁷ The registration system will eventually cover each of the estimated 220,000 refugees living in Uganda.

4. Trends and Market Opportunities

4.1 Key Trends

The Ugandan ICT market is growing at a cumulative annual growth rate (CAGR) of about 25%. The hardware market is estimated to touch USD 63m in 2004 (up 23%) and the software market to USD 22m (up 27%). However, software piracy is rampant, and it could adversely affect growth. The fledgling ICT related services market is placed at USD 25m, mostly from the ICT training, website development and custom software development sectors.

²⁵ The current study is being undertaken by USAID and results are not publicly available.

²⁶ The Monitor, August 12, 2004.

²⁷ IRIN (Humanitarian Information Unit of the United Nations), August 13, 2004.

MTN had invested close to USD 185 million in Uganda by September 2003 and UTL at least USD100 million. This trend is likely to continue as the telcos increase their penetration as well as upgrade their networks. After July 2005, when full liberalization is expected to take effect, substantial investments are foreseen in both the telecom as well as the ISP sectors.

Private businesses are as a group the most e-ready sector in the country. The private sector is investing at a steady rate in automation and capacity building. This is a steady source of investments in ICT that is likely to expand along with economic expansion. Other steady markets are the NGO and non-profit sector. International donor agencies are a major source of work for the ICT industry and the economy at large is still to a great extent dependent on foreign aid. The financial sector has recently begun expanding its automation and is also a major driver of the ICT market.

It has been difficult for Uganda to attract foreign investors. Most firms interested in opportunities in Africa invest in South Africa, and often use it as a base to examine other opportunities in the African continent. Some examples of recent foreign investments in Uganda include fishing (Italy), coffee (Germany), mining, and Bidco (Kenya/Malaysia) is investing in palm oil processing, and shipbuilding (Egypt) for Lake Victoria.

There are some signs of activity in the high-tech sector as well. Anupam Soft Global Ltd of India is setting up a computer assembly plant in Kampala. The premises are ready and include a software training facility. UTL started the import of cheap UTL-branded PCs from China and launched these in mid-July 2004. The price for the PCs is about USD220 including a Microsoft operating system. The sales goal is 15,000 units, which amounts to a very significant market share in Uganda. UTL sees the PC business primarily as an enabler for other technology-based services. The Uganda Investment Agency has also attempted to attract some South African software companies to Uganda; however, those efforts are yet to bear fruit.

As for the mobile telephony market, 98% of the business is pre-paid and about 2% are corporate accounts. The reason is largely the primitive state of payment and credit infrastructure, and the inability to check credit information. The consequence is that in a sense, nobody “owns” the customer and nobody has much detailed data of the customer and customer behavior. The marketing of mobile telephony services has moved from a utilitarian approach to emphasizing lifestyle and status, thereby catching up with the industrialized world. However, margins in the industry are shrinking.

VoIP is expected to drive the market soon. Many operators are examining their options to deliver VoIP services as soon as the market regulation allows it next year.

4.2 Investment Recommendations

To make Ugandan society fully e-ready and allow the development of various technology services directed both domestically and internationally/globally, the basic infrastructure must be in proper condition. Investments need to be made in infrastructure, especially in fiber optic connectivity, particularly between the larger towns and to the submarine trunks, once that becomes a reality. Both MTN and UTL have invested in building fiber links in downtown Kampala. The Government needs to facilitate the creation of a high-bandwidth fiber backbone within the country.

ICT technology parks and incubators need to be developed, which will need a great deal of upfront investment. ICT incubators, especially for ICT enabled services such as call

centers, need infrastructure that can deliver 24/7 services. Double and triple redundancies in critical areas such as power and internet bandwidth are needed. However, it is questionable whether any large investments will be made by the private sector as long as only limited wireless or VSAT based bandwidth is available.

Below is a list of ideas that emerged during the consultations in Uganda. The confidential report elaborates on some of them.

Telecommunications

- Triband dishes
- COMTEL fiber-optic cable – 23 countries have secured funding – to be completed by 2007
- Broadband Services
- WiFi
- Technology for Rural Villages – telecenters / rural telephony
- Computer–Telephony Integration Value Added Service Providers (VAS) to offer Voice / Data synchronization. Screen-based call management solutions;
- HFC (Hybrid Fiber Coaxial) installations to support Cable TV and Video-on-Demand
- Opening up the VoIP market

Software and ICT Services

- Middle to high-end software solutions
- Establishment and management of Storage Area Networks (SANs) – disaster recovery, audits, architecture, etc
- Software testing and assurance
- e-Learning
- Establishment and management of B2B, B2C, and e-government portal architecture
- System migration and Data Integration Services
- High multimedia services – filming, printing advertising

ICT Enabling Services

- Call centres and BPO
- Online banking / WANs in banks
- Utilization of the Post Office
- Electronic security management

4.3 Developmental Impact of Investments

A major criterion in Uganda for making technology investments should be the impact of the investment on the developmental capabilities of the country. This is the concern of government as private companies are unlikely to be driven by development impacts. Therefore, the government will need to ensure, through proper policies and incentives that private sector investments are directed to the areas where the spill-over effects are as large as possible on the whole population. Uganda being a rural society, and knowing the desperately poor condition of infrastructure and the lack of access in many areas, a special emphasis should be placed on investment schemes that improve the connectivity and access to ICT in rural areas. The technology needs in urban areas should not however be overlooked as most of the business community is situated in these areas.

As Uganda is so dependent on agriculture, some major applications benefiting the sector would yield major developmental impact in the country, and among the poor. This sector has received scarce attention thus far. Lack of timely information is known to be the largest constraint on small-scale agricultural production and natural resource exploitation. If farmers could obtain up to date market information, the information imbalance would not be so great between farmers and traders, and farmers could negotiate better prices for their crops.

4.4 Potential Partners

Considering the requirements for the large scale of IFC investment, there are not many opportunities in Uganda. Possible partners, based on size, could be UTL and MTN Uganda. However, MTN Uganda has no constraints regarding financing. It obtains funding from its parent company. UTL is in need of financing and it is already cooperating with IFC on some projects. It could be a potential partner although no new current projects emerged during the assignment. UTL is a competitor of Celtel, where IFC already has a stake. Therefore UTL's (and IFC's) interest in domestic projects may be limited. Simba Telecom, the main MTN distributor, is interested in cooperation with the IFC, and due to strong cash flow and strategically mature approach to business, could be a significant partner in new activities.

Other potential investors include:

- The Madivani Group, which has major operations in the sugar industry;
- James Mulwana owns Uganda Batteries and was formerly chairman of the Uganda Manufacturing Association.
- Oscar Industries own Radio One and are also in the printing and paper business. Charles Mbire is a director on the MTN board but has several other interests in the telecom sector.

4.5 Policy Recommendations

The positive development of the Ugandan telecommunications sector at the end of the duopoly in July 2005 depends on the market being opened in a fair and transparent manner. There are many private companies with forward-looking plans in place to act swiftly, provided that the regulatory changes are predictable and do not favor any particular companies, and the market is genuinely competitive.

Government should pay serious attention to developing a better enabling environment for small ICT business – through training, incentive schemes, incubator centres, access to venture capital and increased selection criteria for local participation in government procurement contracts. The present climate tends to support larger corporations and multinationals, leaving the local entrepreneurs at a disadvantage. This is unlikely to succeed in growing the ICT sector in the future.

There is a need for regional harmonization of telecommunications regimes within COMESA in terms of spectrum management and interconnect rates, the latter being a major stumbling block in the region.

Finally, the policy environment in Uganda, and regionally, is generally good but too little emphasis has been placed on implementation. Linkages between strategy and implementation need to be strengthened.