

# STATUS OF ICT IN UGANDA

*SCAN-ICT PRELIMINARY BASELINE STUDY*

*UGANDA COUNTRY REPORT*

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## Acronyms and Abbreviations

AISI	African Information Society Initiative
BC	Broadcasting Council
CLI	Calling Line Identity
Electronic Data Interchange	EDI
E-mail	Electronic mail
E-commerce	Electronic commerce
FWT	Fixed Wireless Terminal
FM	Frequency Modulator
FTP	File Transfer Protocol
GDP	Gross Domestic Product
GSM	Global System of Mobile Communication
HEP	Hydro Electric Power
ICT	Information and Communication Technologies
IDD	International Direct Dialling
IS	Information Science
ISP	Internet Service Provider
ISDN	Integrated Service Digital Network
ISO	International Organization for Standardization
ISP	Internet Service Provider
IT	Information Technology
ITU	International Telecommunication Union
LAN	Local Area Network
MCPC	Multiple Channel Per Carrier
MIS	Management of Information Systems
MTN	Mobile Telephone Network
MTTI	Ministry of Tourism, Trade and Industry
MW	Medium Wave
PC	Personal computer
SME	Small and Medium sized Enterprises
SNO	Second National Operator
SW	Short Wave
TDMA	Time Division Multiple Access
TELCOM	Telecommunication
UCC	Uganda Communications Commission
UCI	Uganda Communications Institute
UEPB	Uganda Export Promotions Board
UHF	Ultra High Frequency
UIA	Uganda Investment Authority
UMA	Uganda Manufacturers Association
UNBS	Uganda National Bureau of Standards
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
UPL	Uganda Posts Limited
UPTC	Uganda Posts and Telecommunications Corporation
USO	Universal Service Obligation
UTL	Uganda Telecommunications Limited

UTV	Uganda Television
VAN	Value Added Network
VAS	Value Added Service
VCR	Video Cassette Recorder
VHF	Very High Frequency
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
WLL	Wireless Local Loop

## 6.0 UGANDA

### 6.1 General Presentation

#### Preamble

Scan-ICT is an initiative that aims to build support for the phased development of a comprehensive African capability to collect and manage key information needed to support of the growing investment in information and communication technologies (ICTs) as well as the transition of Africa to an information society. Scan-ICT supports the goals of the African Information Society Initiative (AISII), the African mandate to use information and communication technologies to accelerate social and economic development. Scan-ICT aims to be the essential information resource to guide informed planning and implementation of the AISII.

Scan-ICT proposes to implement an African observatory to monitor the penetration, impact and effectiveness of ICT application in Africa. The purpose of Scan-ICT is to enable African nations to collect, analyse, and put to use the information they will need to participate in a global economy.

The experiences of Uganda relating to the levels and impacts of ICT in the economy need elaboration. It is essential for the country to track developments in ICT so as to confront under the best possible conditions the range of challenges with which Uganda is faced. The increasing importance of ICT is creating pressure to update the data and information in many areas of ICT. An area of immediate attention is baseline study to provide basic background information. This would involve gathering suitable monitoring data.

Ultimately, the exercise should develop in the country the capacity to make and implement informed choices about ICTs on an ongoing basis. This capacity is a necessary cornerstone of any effort by the country to muster timely information about recognised problems, which hinder transition to the information society. Overall, in Uganda, many of the necessary data have probably not yet been obtained and practical information on ICT trends is hard to come by. This trend presents a major challenge for Uganda as it moves to an information society.

#### Objectives of the Study

There is recognized need to develop and use sustainable capabilities for forecasting and assessment of ICT application trends in the country, on the basis of national priorities and values. To this end, the Scan-ICT baseline study is meant to attain the following objectives:

- To determine ICT status and continuously scan basic ICT activity
- To develop and continuously refine a set of indicators that can be used to measure ICT activity and progress in Africa and guide investments

- To develop a continuous benchmarking strategy that can be implemented to improve performance of ICTs in Uganda

### **Purpose of the Study**

Scan-ICT proposes to implement an African observatory to monitor the penetration, impact and effectiveness of ICT application in Africa. The purpose of Scan-ICT is to enable nations to collect, analyse, and put to use the information they will need to participate in a global information economy. Within this context, the need for sustained efforts at data generation becomes even more crucial.

The Uganda National Council for Science and Technology (UNCST) jointly with the National Foundation for Research and Development (NFRD) retained the services of a Scan-ICT team of analysts to:

- review relevant national experience in ICT and service, including application, and
- to provide an overview within the context of the Scan-ICT methodological framework.

### **Methodology**

The report is an evolutionary document, which will continuously be updated to conform to the prevailing status of ICTs in Uganda. The assessment and the reporting were performed in a series of linked stages that allowed the report to evolve. In line with the Scan-ICT methodological framework, benchmarks were adopted that indicate the level and extent of ICT diffusion in the country. The findings of the assessment will serve as a valuable source of information for specific updating.

The data was derived from a variety of sources, including selection of appropriate indicators and available facts, figures and other relevant information. Appropriate design options were selected in to conform to the Scan-ICT methodological framework. The terms of reference for the study were drawn in context of the Scan-ICT methodological framework, including lines of inquiry and key AISI themes.

The lines of inquiry adopted focused on assessment of the following:

- Infrastructure
- Strategic planning
- Capacity development
- Information economy, and
- Sectoral applications

Key themes include:

- ICT status (estimate of existing situation), compilation of information describing current status and progress within the AISI themes
- Sources of information and knowledge

- ICT indicators and benchmarks

On the basis of the themes, the following activities were undertaken:

- Literature on national ICT trends as well as background information from various documents and reports was reviewed,
- Specific indicators were adopted and used to track various ICT sector trends in Uganda
- Glossaries were developed and adapted from other sources
- Survey instruments were developed and field tested – questionnaires were designed to collect primary data
- The study was conducted in two phases with the first part covering Kampala metropolitan area and the second phase covered upcountry and outlying areas
- Information was collected by administering the instruments and conducting interviews
- Information on past, present, and future ICT projects was collected and collated
- Colloquia were organised to share experience and lessons learnt during the design and application of survey and data collection instruments
- Various secondary sources of basic statistics were reviewed
- Consultations with key players were conducted to elicit views on various ICT trends
- Information obtained was appropriately recorded, interpreted and analysed to establish ICT trends
- Data obtained were analysed and summarised as appropriate
- A stake holders workshop was organised to review national data and information on ICTs by the Scan-ICT study team with a view to obtain comments, feedback and consensus from stakeholders

The above activities paved the way to the preparation of the final draft report.

### **Constraints**

Despite efforts that were undertaken, a number of outstanding issues remain:

- The lack of concrete data and the problem of gathering them have constituted major obstacles. Hard data on what is actually happening on the ground is lacking.
- Empirical work relating to ICT trends analysis in the country is very preliminary. Given the limitation on the scope of the available data, the study relied heavily on available secondary data from various sources.

Some data was unavailable for a variety of reasons namely:

- absence or inadequate data available
- respondents were slow in responding to the instruments
- regulatory obligations for the provision of data

The study took cognisance that the exercise, of necessity, is likely to be a continuous process of updating information on ICT trends. Consequently, the inadequacy of the time to cover the vast areas of the country and address information details will be addressed in the course of time.

### **Scope and Focus of the Report**

The main objective of the assessment is to provide reasonably timely data required for monitoring, especially on the basis of available secondary information, and to fill critical gaps in national reporting, especially for the most recent years. To this end, this report was compiled as an update on the existing state of affairs in the ICT sector-consistent with the broader Scan-ICT focus to study ICTs in the African context.

The results are generally robust and the evidence from the various sources was consistent. Some of the estimates, however, cannot be considered to represent the national picture. Studies on sectoral applications covered mainly the Kampala metropolitan area and also some upcountry districts. Also addressed are matters pertaining to information economy, strategic planning, and capacity development.

There are rapid changes taking place in the ICT sector. Given this state of affairs, the information in this report will face similar changes. This will necessitate constant update of the information contained in this report.

#### **6.1.1. Location and Demography**

Uganda is landlocked, covering an area of about 236.000 sq km laying astride the Equator in east Africa. Uganda has common borders with Sudan in the north, Kenya to the east, Tanzania and Rwanda in the south and the Democratic republic of the Congo to the west. Kampala is the primate city and the seat of government.

**TABLE 1: NATIONAL DEMOGRAPHIC CHARACTERISTICS AND TRENDS<sup>1</sup>**

INDICATOR	1991	1995	2000
Total Population (millions)	16.7	19.3	22.2
Female Population (millions)	8.5	9.8	11.2
Male Population (millions)	8.2	9.5	11.0
Population Growth Rate (%)	2.5		2.9
Total Fertility Rate (births per woman)	7.1	6.9	6.9
Maternal Mortality Ratio (per 100,000)	700	506	504
Births Attended by Trained Personnel (%)	38	38	38
Infant Mortality Rate (per 1000 live births)	122	81	88
Under 5 Mortality Rate (per 1000 live births)	180	147	152
Life Expectancy at Birth (in years)	48		43
Average Age at First Marriage	17.5	17.5	17.8
Average Age at First Birth	18.5	18.6	18.7
Age Group 0-14	47.3	-	48.9
Age Group 15-64	49.3		
Poverty Level (%)	56	44	35
Literacy Rate (%)	54	62	68
Primary School Enrolment (millions)	2.3	2.6	6.8

Over the next five years, Uganda's population is projected to increase by more than 90%. This increase is likely to affect the proportion of the population living in rural areas which is projected to decrease from the current 84% to 62%, and that for urban area is projected to increase from the current 16% to 38% by the year 2005. The population is unevenly distributed<sup>2</sup>. The projected changes in population distribution will have serious implications for social and economic development, environment and resource conservation. Currently, only 11 districts out of 56 have populations of 650,000 people or more and the majority of these districts are found in the southern half of the country.

### 6.1.2. Economic Performance

Uganda has undertaken comprehensive reforms in its economic management, and has within the last decade achieved stabilization of its public finances. Since 1987 Government has implemented both macro-economic reforms that have focused on restoring and maintaining macro-economic stability and undertaken structural reforms aimed at improving the country's economic, social and institutional infrastructure. The government's macroeconomic adjustment policies and the accompanying structural reforms have been at the core of the recovery process, including a series of

<sup>1</sup> The State of the Uganda Population Report 2001 Published by the Population Secretariat (MFPED)

<sup>2</sup> Ibid

significant reforms in the financial, industrial, business environment and social sectors.

It is clear that government alone cannot provide the necessary investment for the expansion of the economy, including the ICT sector. Government's major role in Uganda's private sector driven economy is mainly to provide the necessary legal, policy and physical infrastructure for private investment to flourish.

Together with other key development partners, the Government has implemented several key structural reforms with considerable synergy, i.e. constitutional reform, civil service reform, public enterprise reform and private sector development and the decentralisation of government. Uganda is transforming itself into a service-oriented economy where information and communication technology is playing an important role in supporting the expanding business sector as well as agriculture, manufacturing, tourism and related industries.<sup>3</sup>

Uganda has a fast growing economy, which averages at the rate of 8% per annum over the last ten years.

Uganda has achieved a credible level of GDP growth<sup>4</sup>. The average rate of GDP growth has been 6.9 percent per annum since 1990/91, resulting in an annual 3.7 percent increase in real GDP per capita and a 20 percent decline in poverty (head count index) from 1991- 1997. Growth is projected to be highest in transport and communication (9%) followed by construction (8.5%) and electricity and water supply (7%). The growth in transport and telecommunications has mainly come from increased access to telecommunication services, which expanded by 35%. There has been a fast expansion in mobile cellular, Internet and fixed telephone services

On the social front progress has been made in respect of, for example, primary school enrolment and reduction in HIV/AIDS prevalence.

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<sup>3</sup> Culled from Uganda Investment Authority's the Big Push Strategy

<sup>4</sup> Background to the budget 2000-2001

**TABLE 2: INDICATIVE ECONOMIC PERFORMANCE**

INDICATOR	YEAR	US\$
GNP per capita	1999	320
GNP at factor cost	2000	7839
GDP at market price	2000	6,140
GDP at factor cost	2000/2001	
Agriculture		1,567,553
Mining and quarrying		25,938
Manufacturing		341,895
Electricity/Water		38,902
Construction		322,489
Commerce		53,1321
Transport and Communication		207,607
Community Services		574,653
Owner Occupied Building		115,414
Total Gross Domestic Product		3,725,835

### 6.1.3 Political Structure and Governance

Form of State:	Republic
National Legislature:	305 – Member Parliament is the national legislature
Head of State:	Executive President
National Government:	The National Resistance Movement (NRM) is the ruling political organ elected through adult suffrage.

The National Resistance Movement (NRM) leadership assumed state power in 1986 and set out to establish a broad based system of governance without involving political parties. The Movement system of governance is based on individual merit. In 1995 the country adopted a new constitution. Under this constitution regular elections are held at local and national levels, including direct presidential elections. This has contributed to relative peace and stability in most parts of the country.

Government policy of decentralisation<sup>5</sup> is founded on the devolution of responsibility for planning, resource management and service delivery to 52 districts with further administrative units at the county, sub-county, parish and village levels. While the local governments (LGS) in Uganda are autonomous corporate entities, the Ministry of Local Government and its Decentralisation Secretariat exercise broad oversight of their performance, and functions as coordinator of policy and central support facilities for the decentralisation work. Within this decentralisation framework, districts take on major roles to run a decentralised government.

### 6.1.4 Culture

Uganda enjoys a rich cultural heritage stemming from the country's ethnic diversity. Uganda is country with a pronounced pluralistic society. Deep-rooted demarcations

<sup>5</sup> The system of Local Government in Uganda is provided for in the 1995 constitution and the Local Government Act.

permeate the fabric of society in population structures and locations, languages, economic activities and religious beliefs and so on. As a result of colonial rule, new religions, modernization, and education cultural practices have undergone some changes, and adherence to tradition is not as strong as it once was. However, traditions in marriage, dress, and diet still hold. Settlement is generally dispersed.

### **Language Structure**

More than forty languages are spoken in Uganda<sup>6</sup>, although the indigenous population may be classified into four major language groupings: Bantu, Nilotic (western Nilotes), Nilo-Hamitic (eastern Nilotes), and Sudanic. There are differences within each group. The Bantu groups occupy most of the southern half of Uganda. The Nilotic (Luo) speaking groups occupy the central section of northern Uganda, while the Nilo-Hamites live in the northeast and the Sudanic in the northwest.

The Bantu tribes comprise: Bafumbira, Baganda, Bagisu, Bagwe, Bagwere, Bakenyi, Bakiga, Bakonjo, Bamba, Banyankole, Banyarwanda, Banyoro, Banyuli, Basoga, Batoro, Batwa, and Samia.

The Nilotics comprise: Acholi, Alur, Jonam, Langi, Luo, and Padhola.

The Nilo-Hamites comprise the Iteso, Kakwa, Karimajong, Kumam, Labwor, Sebei Pokot (Suk), and Tapeth.

The Lendu, Lugbara and Madi make up the Sudanic group.

The official language in Uganda is English. Swahili is spoken and understood by some but has not been accepted as the lingua franca.

### **Religion**

The major religions in Uganda are Christianity, to which about 85% of the people nominally belong, and Islam, of which 11% are followers. Those who do not fall within these two broad categories practise either the traditional (animist) religions or are atheists.

### **Gender Issues**

Sustainable national development requires effective involvement of both women and men. Women constituted 51 percent of Uganda's 16.7 million people (1991 Population Census). Women specific interventions and considerations are still essential in order to narrow the historical imbalance between men and women. Uganda has made impressive attempts in formulating gender sensitive policies to positively integrate gender mainstream of the development process<sup>7</sup>. In the vision 2025<sup>8</sup> Uganda aspires for a future in which women are empowered to participate as

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<sup>6</sup> Third schedule in Uganda's 1995 constitution enumerates 56 indigenous communities as at 1st February 1926.

<sup>7</sup> The National gender Policy (1997) affirms the equality of women before the law.

<sup>8</sup> The draft-working document is intended to stimulate further national debate on the future development path of Uganda and provide an opportunity for the country to plan its development.

equal partners in development with the benefits of development shared equally among women and men.

## 6.2

## ICT Infrastructures

### 6.2.1 General description, indicators and benchmarks

#### Introduction

A well-developed ICT infrastructure could lead to a more rapid rollout of ICTs and ensure higher growth of the sector. In Uganda, while the growth in service provision and the ICT sector has been striking in recent years, there is still some way to go. Certain levels of basic infrastructure as well as organisational activities are generally required for the direct benefits of the information society to be realized. Perhaps, the lack of adequate ICT infrastructure is the key problem constraining developing information services in Uganda.

Despite the obvious benefits of information and communication technology infrastructure, uncertainty exists about their implications and its likely rate of diffusion in the country. There is growing evidence of success in infrastructure development and growing consensus that new initiatives that build on these successes are needed, and this bode well for the future. New opportunities exist to strengthen infrastructure and to allow delivery of services in society. The analysis of conditions in Uganda, as well as international experience, point clearly in that direction.

To provide some perspective on how Uganda's ICT infrastructure performance, the study gathered information and data on Uganda's ICT infrastructure.

#### Indicators and Benchmarks:

##### (a). Definitions

(a). ICT Infrastructure the broadly conceptualised ICT infrastructure is viewed as a comprehensive entity that encompasses network infrastructures, terminals, software applications, human resources, public and private communications systems, as well as values and lifestyles related to the informatisation of society.

(b). Telecommunications encompasses all forms of information transmission, including data (text and binary), voice and video signals over public telephone or data networks, satellite or radio links, dedicated lines, fibre optics, ISDN, or coaxial cable. Telecommunication networks involve traffic, network management, tariff administration and human resources elements. Telecommunication policies influence the implementation and operation of communication networks<sup>9</sup>.

Indicators are used to reflect the overall status and trends of national ICT infrastructure. The national ICT infrastructure profile is composite measure of the robustness and shortfalls of national ICT infrastructure attainments and gives a broad stock measure. Taken together, these indicators provide a broader analysis of some of

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<sup>9</sup> Based on Bakis, H (1997). From Geospace to geocyberspace territories and tele –interactions. In Development and Telecommunications: between global and local. Edited by Rich, E.M. and H. Bakis, Aldershot: Ashgate

the critical issues that need to be addressed in this area<sup>10</sup>. Many of the indicators are adapted from the ITU and may appear imprecise and of doubtful relevance.

Key dimensions of telecommunications infrastructure comprise:

- Network
- Market structure
- Transmission networks
- Switching
- User equipment

## **(b). Telecommunications Infrastructure Indicators**

### **(i). Overall sector development indicators**

- Telephones (fixed and mobile)
- Internet hosts
- Internet users
- Internet traffic
- Radios
- Television sets
- Computers

All considered on a per capita basis

### **(ii). Cost and quality of service Indicators**

- Cost of local calls
- Cost of international calls
- ISP service
- High bandwidth connectivity
- Waiting time for a phone line
- Percentage of calls completed successfully

### **(iii). Quality of content indicators**

- Size and number of local language websites, and
- Frequency of hits

### **(iv). Extent of competition indicators**

- Existing number of operators

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<sup>10</sup> Many of the indicators are based on ITU World Telecommunications Development Report Yearbook. The sources for other indicators are provided at the end.

#### **(v). Poor Quality of Telephone Services indicators**

Without telecommunications infrastructure, business will suffer from lack of interoperability and universal access to all subscribers. The following indicators manifest poor quality telephone services.

- Problems in distribution
- High unsatisfied demand
- And low call completion rates
- Low density
- Seriously underserved rural areas and
- Inadequate networks
- Lack of regime and human resources infrastructures to select, install, and maintain equipment
- Inefficient tariff/tax structure

#### **(vi). Universal Access indicators**

According to the ITU widespread telephone availability is the cornerstone of universal access. In this context, universal access examines:

- Nation wide coverage
- Non discriminatory access and
- Nationwide availability

In Uganda:

- Access expansion is achieved through rollout obligations in the licenses for the major operators and where this is not possible, through establishing and utilizing a fund.
- Both the fixed and mobile licenses have build-out obligations.
- The incumbent build-out requirement is 100,000 lines in five years.
- The SNO requirement was originally 60,000 although the winning bidder committed to build 89,000 lines.
- The SNO bid evaluation criteria included network rollout commitment in addition to the bid price.
- The SNO license allows MTN to also offer mobile cellular services, and it aims at meeting the rollout target using GSM technology rather than fixed lines.
- In Uganda ten companies have been licensed to provide card payphones.
- Payphone targets have been set for the operators to be achieved within five years.

**(vii). Universal Service/access finance**

- Rural Communications Development Fund (RCDF) policy developed
- RCDF manual developed
- RCDF development partners identified
- Contract signed with IDA for funding RCDF activities
- Tender for RCDF operations issued

**(viii). Service Availability – referring to nationwide coverage whenever and wherever required.**

It is evident that:

- Uganda has attained a significant growth in telephone customer base from base from 50,000 fixed lines in 1997 to more than 400,000 mobile lines and 60,000 fixed lines to date
- Without widespread geographical availability achieving very low levels of household telephone penetration. The development of telephone infrastructure is mainly concentrated in the urban areas.
- Presently, rural areas are typically excluded from the benefit of telecommunications services whatever criteria are applied, e.g. penetration or accessibility
- Privatisation has had an initial positive impact upon network growth and access. New market entrants have increased the supply of telephone lines and significant increases in telephone density have been achieved<sup>11</sup>.
- Although much of the infrastructure development has been centred in Kampala, services and access have expanded to district centres and some rural areas.

**(ix). Affordability – in terms of wide availability entails that telephone service should be priced so that most users can afford.**

- In Uganda, the Uganda Communications Commission is charged with protecting consumers against excessive tariff rises and avoid unfair tariff competition through establishing a standard tariff system.
- The Ministry of Works Housing and Communications remains responsible for tariff approval and the establishment of license fee.

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<sup>11</sup> See ICT infrastructure profile

#### 6.2.1.1 Telephony

Telecommunications service in Uganda is distinguished by the following characteristics:

- In Uganda network evolution is taking place at a very rapid rate. Several initiatives are already afoot that could have a substantial impact on information society trends in the country.
- New technologies now exist which have the capability to make telecommunication services available and at a much lower rate.
- The telecommunications sector has experienced tremendous growth mainly attributable to liberalisation of telecommunication services<sup>12</sup>. This growth is typified by:
  - New market entrants have brought in a whole range of satellite-based technology
  - Two national operators have been licensed
  - Three mobile phone operators have been licensed
  - Cellular mobile phone services marked a turning point in business trends
- Statistics from UCC show that the number of subscribers on the three networks rose from 3,000 in 1996 to over 188,568 in 2001. Telephone subscriptions increased from 24,051 (fixed lines) in 1993 to over 140,000 of both fixed and mobile phone lines by the end of 1999 and subscriptions have reached more than 400,000 mobile lines and 60,000 fixed lines by mid 2002
- Uganda's telephone density for both fixed and mobile phones currently stands at 2 lines per 100 persons the target is to improve it to 3 lines per 100 persons by the year 2003.
- The number of persons per phone line reduced from approximately 747 persons in 1993 to 154 persons per phone line by the end of 1999.
- The number of public payphones has increased with MTN having established 1,500 of the at least 2000 their license obligation requires them to establish in five years.
- Optic fibre is still in the primary stage, which mainly involves laying the optic fibre cable network.
- Basic telephone services fall short of real needs and the quality of the support network and associated services is below ITU standards.

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<sup>12</sup> See the section on project inventories for highlights

## **Switching Infrastructure**

- The country has been left with a mix of old and new switching equipment, with only a small part connected to the digital exchange.
- Uganda's telecommunications operators are upgrading their switching infrastructure to upgrade ageing analogue switching infrastructure.
- Most end-user links to these switching centres are, however, via traditional twisted copper links.

Recently Uganda Telecom Limited (UTL) commissioned an ultra modern national/international digital exchange. It has the latest features like integrated voice and data handling (ISDN) capacity and being fully computer controlled. In the trunk links there has been a corresponding modernisation in various parts of the country.

## **Functionality / Transmission systems**

Rapid technological evolution in telecommunications has brought great opportunities for expanding, lowering costs, and upgrading services. The extent of advanced telecommunications capability is an important indicator determining country's infrastructure growth levels.

In Uganda, local capability is wide ranging and growing to include:

- Digital switching – Uganda has achieved over 75% digital main lines and 100 % digitisation of its cellular mobile telephony.
- Optical and microwave transmission;
- Line and wireless equipment;
- Data including leased line networks;
- Cellular switching base station infrastructure. The country's three GSM mobile cellular networks use state-of-the-art switching equipment for their Mobile Switching Centres (MSCs). The cellular network operators in Uganda launched network expansion drives to cover many parts of the country

## **Satellite and Satellite Communications**

- ◆ Satellite for basic telephony is an exclusive service during the exclusivity/duopoly period
- ◆ A number of earth satellite stations for telecommunications services are owned by UTL and MTN
- ◆ Before the duopoly period several ISPs were providing services, presently about eight retain the status to provide international gateway
- ◆ There about nineteen initiatives with wireless networks- mostly through VSATs to deliver Internet services to both urban and rural areas
- ◆ Provision of satellite services for broadcasting is a free for all with a universal possibility to uplink or down link

## **Service Provision**

### **(i). Licensing Regime<sup>13</sup>**

There are basically two types of licenses offered by the UCC:

### **(ii). Types of licenses**

- A. Major License
- B. Minor License

### **(iii). Major License Services**

- A. Basic Telephony Services including Local, National, and International Telephony Services
- B. Cellular Telecommunication Services
- C. Major Postal Operator
- D. Trunk Capacity Resale Service, including provision of lines and circuits
- E. Satellite and Telecommunications Services, and
- F. Third Party Private Network Services

### **(iv). Minor Licenses**

- A. Paging Services
- B. International Access Services
- C. Public Internet Café Services
- D. Telex services
- E. Courier Operators
- F. Public payphone and fax bureau services
- G. Sale, lease and maintenance of subscriber premises wiring terminal

By January 2002 Uganda Communications Commission had licensed the following:

- A. 2 National Telecommunications Operators
- B. 1 National Postal Operator
- C. 3 Mobile Telephone Operators
- D. 17 Internet Service Providers
- E. 100 Private FM Radio Stations
- F. 26 Private Television Stations
- G. 10 Courier Services Companies

The table 3 below gives a comparison of the services in 1996, when telecommunications reforms were instituted and 2002; six years after reforms were instituted.

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<sup>13</sup> Culled from UCC website: <http://www.ucc.co.ug/html/licenses>

**Table 3: Comparison of Telecommunication Services in 1996 and 2002**

INDICATOR	1996	2002
Fixed Telephone lines connected	46,207	60,000
National Telephone Operators	1	2
Mobile Cellular Operators	1	3
Mobile lines	3,500	400,000
Internet Service Providers	2	17
Public Payphone licenses	1	10
Paging	2	-
Data Networks	2	

Licensed telecommunications operators in the country offer the following services.

**(a). Services offered by the Uganda Telecom Limited (UTL)**

The backbone on which UTL build its network, as it migrates, to high-speed landlines (ISDN) is available. It is able to handle:

- a. Voice
- b. Data, and other multimedia services
- c. High-speed Internet Access

**UTL Coverage**

UTL is continuing to upgrade its network to the benefit of better quality for voice, fax, data and Internet access.

UTL (TELCEL, MANGO) has now been in operation for slightly over a year offering mobile phone services. UTL is the fastest growing mobile network in the country and has extended its mobile network to ten major towns of Uganda, including: Greater Kampala, Entebbe, Mukono, Jinja, Iganga, Mbale, Tororo, Masaka, Mbarara and Kabale.

**Landlines/Fixed Lines**

UTL landlines are expanding too as well as higher voice quality.

Areas covered include:

Kampala- served by a high-speed landline, Entebbe, Jinja, Mbale, Masaka, Mbarara, Kabale, Arua, Gulu, Moroto, Soroti, Masindi, Rakai, Kasese, Luwero, Tororo, Kamuli, Lira, Kumi, and Rukungiri.

**Internet Services**

UTL online offers Internet services using the following access technologies:

- Dial-up access – with modems literally all major towns of Uganda

- Leased Line Internet Access- with xDSL technologies over copper pairs in Greater Kampala, Entebbe, Mukono, Jinja, Mbale, and Mbarara.
- Broadband Wireless Internet Access:
- UTL online has deployed a broadband wireless system in Kampala District, with plans to roll out to other towns
- Internet services that can be provided using

**Leased lines or wireless access are:**

- 64/4 Kbps
- 64/8 Kbps
- 64/16 Kbps
- 64/32 Kbps

**Dedicated access**

- 64/32 Kbps (down/up) Internet Access
- 64/64Kbps (down/up) Internet Access
- 128 (64)/64 Kbps (burst down/up) Internet Access
- 192 (128)/64 Kbps (burst down/up) Internet Access
- 320 (256) 128 Kbps 9burst down/up) Internet Access
- 512/256 Kbps (down/up) Internet Access

**Dedicated bandwidth Leased Circuits**

- 64Kbps (average)
- 128 Kbps (average)
- More than 128 kbps (Average)
- International Lease lines

**Extras:**

- FTP (File Transfer Protocol) access
- Domain Name Registration
- Domain Name Hosting
- Web Hosting

**Services offered by the Mobile Telecommunication Network (MTN)**

MTN was awarded a Second National Operator (SNO) license by the Government of Uganda, under which license the company was required to set up 89,000 new lines within a five-year period. MTN is required to install at least 2000 payphones in the first five years.

The achievements of MTN can be summarised as follows:

MTN Uganda Limited has:

- Invested US\$ 68 million during 2000 in order to upgrade its existing network in the country with 26,000 kilometres covered by the MTN network across Uganda
- Offers fixed and mobile wireless communication services
- Shared access services (payphones) – MTN Publicom was formed and over 1,500 payphones have been installed in less than 16 months of telephone services
- Set up the first optic line in East Africa

**Other services offered by MTN include:**

- I. Fixed wireless services, like mobile wireless
- II. Euro set Fixed Phone
- III. ISDN Fixed Wireless Terminal
- IV. Standard service including voice mail, call barring, calling line identity
- V. Internet
- VI. Data
- VII. Fax

**Services offered by Celtel Uganda – Network Rollout**

**CELTEL** – the pioneer mobile phone company is rolling out infrastructure countrywide. Celtel has invested over \$ 40 in developing cellular communication solutions in Uganda.

Celtel’s network covers the central, north, east, and the west. Celtel’s mobile network covers the following areas:

**Central:** Bombo, Buganga, Buwama, Entebbe, Kalangala, Kampala, Kyazanga, Lukaya, Lyantonde, Masaka, Mbirizi, Mityana, Nkozzi, Ssesse Islands, Sembabule.

**East:** Jinja, Iganga, Mbale, Tororo, Malaba, Busia

**West:** Mbarara, Bihairwe, Bushenyi, Ishaka, Rwagaju, Lake Mburo National Park, Kabwohe, Ibanda, Kasese and Fort Portal.

**North:** Arua, Paidha, Koboko, Moyo, Adjumani

Celtel’s state-of-the-art network covers 75 % of Uganda’s population.

**Table 4: Telecommunication and Internet Subscribers**

INDICATOR	1998	1999	2001
Fixed Telephone services	55,749	57,913	58,880
Cellular Subscriber	12,000	72,602	276,034
Internet Subscriber	504	4,248	5,999

Source: Uganda Communications Commission

The statistics indicate that subscribers for both fixed landlines and mobile cellular have continued to grow at an exponential rate. The trends in telecommunications worldwide have seen the growth of mobile telephony more than fixed lines. In 1996 Uganda had only 3,500 mobile phone subscribers compared to more than 276,034 now. Mobile cellular operators grew from one in 1996 to three in 2002. The statistics clearly indicate that there has been tremendous development in mobile cellular telephony in Uganda.

**Table 5: Comparative Telephone and Internet Subscribers: 1993-1999**

Service	1993	1994	1995	1996	1997	1998	1999
Fixed telephone	24,051	34,9494	43,039	47,927	49,236	54,074	5,576
Cellular phones	-	-	-	3,000	n.a	n.a	82,576
Total	24,051	34,9494	43,039	50,927	n.a	n.a	140,097
Internet service	n.a	n.a	n.a	1,000	n.a	n.a	5,304

Source: Uganda Posts and Telecommunications, and Communications Commission-culled from Statistical Abstracts 2000 (June).

#### 6.2.1.2 Analysis of Internet Trends

Analysis is limited to the network or the underlying technology over which services are provided. The key indicators of Internet development used in this study are:

- a. The number of host computers
  - b. The number of Internet Service Providers
  - c. The number of users derived from reported counts of ISPs.
- The analysis demonstrates the Internet has continued to grow in Uganda. All the three-telecom operators have moved into the Internet services market by establishing the International Internet backbone. They compete with international VSAT links.

- The number of Internet hosts is also increasing with the country adding nearly to ten.
- Internet use is small but growing quickly. Estimates of present users are non-existent. The number of dialup Internet Subscribers is estimated at 5,999.

It is difficult to measure the total numbers of Internet Users; rather figures for the number of dialup subscriber accounts are more readily available. Dialup subscribers in Uganda are declining due to use of wireless links.

### **Internet Kiosks/cafes**

Internet cafes are becoming popular among mainly the urban elite as a form of Internet access. There are now approximately 25 Internet cafes in Kampala and this facility has spread to several towns.

UCC has licensed over 30 ISPs to sell services. Several ISPs now operate their own VSAT links into the US backbone.

### **Critical Success Factors**

Factors that are essential to allow diffusion of the Internet include:

- Well developed telecommunication network
- Domestic network and connections to the backbone network
- Transmission facilities connecting a country's domestic network to the greater Internet

### **Impediments to Internet usage**

Despite obvious benefits of the Internet, uncertainty exists about the underlying implications and rates of Internet diffusion. On the whole, Internet diffusion and use in the country is severely constrained by the availability of telephone services. The basic obstacle in the path of rapid Internet growth is lack of telecommunication infrastructure. Irrespective of the actual causes, this translates into:

- Sparse and unreliable fixed network.
- Low level of telephone penetration rates in the country. Low telephone density has a negative impact on Internet access
- High international tariffs is a major constraint on universal access
- Lack of circuit capacity
- Lack of local loop necessary for basic dialup modern access
- The poor quality of the local loop infrastructure impedes connections to the domestic backbone
- Slow and unreliable connections
- Frequent and long power interruptions

- Internet bandwidth is lacking because international leased lines are costly, which has resulted in ISPs crowding too many users into limited bandwidth channels

Other constraints relate to:

- The high cost of personal computers
- Low availability of computers – the price of hardware and software relative to income is a major inhibiting factor for wider use of computers
- Lack of computer literacy and low skills with Internet programs
- Lack of complimentary services
- High license fee

### **Current Internet situation**

In Uganda individuals and institutions are implementing Internet solutions.

In Uganda, Internet diffusion is expanding and has continued to grow although from a very low base. According to data published by different sources including the ITU the number of Internet subscribers grew from 1000 in 1996 to 5,304 in 1999. At the beginning of 2000, together the four active ISPs had some 4,100 accounts, which probably equates to around 25,000 users.

- For the most part, Internet services run over conventional telecommunication networks.
- Despite the relative growth in Uganda, it has continued to be urban based
- There are no points of presence in other parts of the country, users outside the capital must use expensive dial-up connections, which substantially increase the cost of Internet access

### **Internet Content Development**

Creating and maintaining web content is an important indicator of web content development. In Uganda, although expanding, there are few institutions using the web to deliver information. The cause of this scenario can be attributed to:

- Low penetration of the Internet in the economy
- Limited number of local people with access to the Internet
- Limited institutional connectivity
- Limited skills of web design
- High cost of local web hosting services

There a few government websites, web presence is higher in the private sector, many of which focus on commercial and business concerns. The main focus in the Uganda ACACIA initiative<sup>14</sup> is the development of content.

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14 Acacia is an international initiative to empower rural communities in African countries to apply ICTs for their own social and economic development.

### **Companies/Institutions dealing in web design**

Although existing the existing number of companies has not been established in this study, it is quite evident a number of them are emerging to meet the growing corporate requirements for web design in both the public and private sectors.

### **Public Access**

The existing state of telecommunication service in the country leaves much to be desired as a gateway to the Internet.

On the whole, Internet diffusion is severely constrained by the availability of telephone services in the country. Thus translating to:

- Low levels of telephone penetration rates
- The high cost of telecommunication connection
- Lack of telephone service to homes and businesses
- Frequent and long power interruptions
- High equipment costs are a major barrier to home IT use
- Existing facilities are of insufficient capacity and have to be extended to many places that lack even basic telephone services.
- The infrastructure that would make Internet services available is not available in many places. The situation is typified by:
  - High costs and slow and unreliable connections
  - Lack of local loop necessary for basic dial up modern access
  - Poor quality of local loop
  - Lack of complimentary services
- Internet bandwidth is lacking because international leased lines are costly, which has resulted in ISPs crowding to many users into limited bandwidth channels.
- However, liberalisation of the VSAT and wireless markets has contributed to growth of Internet services
- There is rapidly growing interests in cyber cafes. Internet cafes rollout in Kampala is particularly notable

## Prospects for Public Access

While the number of businesses offering services like email services, coupled with the number of cafes in Kampala and other urban areas, is growing, the number of individual business using the Internet as an integral part of operations remains low. Email is the most widely used function of the Internet<sup>15</sup>.

Perhaps prospects for public access to the Internet rest on:

- Given the enormous investments required for telephone lines, hope for improving the situation rests largely on the spread of alternative means of accessing the Internet.
- The availability of cellular phones and satellite systems is likely to reduce dependence on telephone lines for access to the Internet in future. Much of the Internet capacity may be available at relatively low costs
- Internet cafes seem to be the most viable option for public access to the Internet

**Table 6: Average Rates for Internet Connectivity in Uganda**

Types of Connections	Installation in US\$	Monthly subscription in US\$
Wireless	1600	2,400
Dialup Access Internet unlimited access	50	40
Internet unlimited	-	40
8.am-6pm		30
6pm-8pm		25
E-mail unlimited		

## Internet at the Multipurpose Community Telecentres (MCTs)

Multipurpose Community telecentres represent shared public access facilities, which provide Internet Access. MCT initiatives in Uganda aim at providing access to advanced information and communication services in rural and remoter areas as well as deprived/underserved urban areas.

## Acacia Integrated National Programme

Uganda is one of the countries selected by the International Development Research Centre for support within its Acacia initiative to empower rural communities in African countries to apply ICTs to their own social and economic development.

<sup>15</sup> World Bank, (2000). Global Economic Prospects and the Developing Countries

Although the programme aims at benefiting rural communities, it also targets people in all sectors of community life so that they are brought into the main stream of Uganda's economic development.

### **Multipurpose Community Telecentre (MCT) Pilot Projects**

Currently under the Acacia Project Uganda has three pilot multipurpose community telecentres:

- 1) Nakaseke Multipurpose Community Telecentre,
- 2) Buwama Multipurpose Community Telecentre
- 3) Nabweru Multipurpose Community Telecentre

ICTs held by MCTs include:

- I. Radios
- II. Television and video deck
- III. Telephone
- IV. Fax
- V. E-mail/Internet
- VI. Photocopier
- VII. Computers
- VIII. Printer
- IX. Overhead projector and slide

### **Services provided at the MCTs:**

- I. Computer training
- II. Typesetting
- III. Internet and Email
- IV. Video shows
- V. Photocopying
- VI. Facsimile
- VII. Telephone
- VIII. Overhead and slide projector
- IX. Information on agriculture; business for entrepreneurs, health matters; education for students, and researchers

All the three telecentres provide:

- I. Access to data networks like Internet for email and file transfer to electronic libraries and databases and
- II. Environmental monitoring systems.
- III. They also offer facilities, which may later be used for distance education, telemedicine, and other content applications.

The main focus in the Uganda ACACIA initiative is the development of content.

### **Broadcasting Infrastructure**

Broadcasting services provide basic information infrastructure. Access to radio and television services is an important indicator on the development of the broadcasting

infrastructure. It is hard to ascertain the total number of radios and television sets in the country, given that their importation is not regulated. At the same time it is quite difficult to enforce licensing of television in the country, from which estimates could be made

#### 6.2.1.4 Television Penetration

- There are 26 private television stations
- Most TV stations are based in Kampala<sup>16</sup>
- Only UTV with VHF goes to rural areas others on UHF- a weaker infrastructure are limited to Kampala.
- Cable television is virtually absent in Uganda, but with the present optic fibre installations going on prospects exist in the future.

#### 6.2.1.5 Radio Broadcasting

- Notably, several FM radio stations have sprung up in the country – the number registered by UCC is 100.

Useful indicators on the development of radio broadcasting infrastructure include:

1. Downlink equipment installed annually
2. Transmitters connected to the uplink annually

The number of new installations indicates the number of radio stations in operation. For Uganda, approximately 10 downlink equipment and transmitters are installed annually on the average from 1996 to 1998.

1. There are 100 licensed private FM radio stations

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<sup>16</sup> See infrastructure profile for actual number of licensed TV stations

**Table 7: Comparative Summary of the Communication Services Sector in Uganda for 1996 through 2001**

	Service Provided	DEC 1996	OCT 1998	DEC 1999	FEB 2001	JULY 2001
1	Wired telephone lines	45,145	55,749	57,913	58,880	52,054
2	Fixed wireless lines	Not Operational	447	148	932	1900
3	Fixed wireless pay phones	Not Operational	0	200	1650	2195
4	Mobile cellular subscribers	3,000	12,000	72,602	188,568	276,034
5	Internet/ email subscribers	504	1308	4248	5688	5999
6	National Telecommunications Operators	1	2	2	2	2
7	Mobile Cellular Operators	1	2	2	3	3
8	VSAT International Data Gateways	2	3	7	8	8
9	Internet Service Providers	2	7	9	11	11
10	Public Pay Communications Network Services	1	10	30	42	47
11	Private FM Radio Stations	14	28	37	100	112
12	Private Television Stations	4	8	11	19	20
13	Private Radio Communication Licenses	453	530	688	770	800
14	National Postal Operator	1	1	1	1	1
15	Courier Service Providers	2	7	11	10	10

Source: Uganda Communications Commission

**Table: 8. National ICT Infrastructure Profile 2000- 2002**

Indicator	2000	2001	2002		Percent growth
Fixed lines	-	58,880	60,000		-
Fixed wireless lines	-	932	-		
Internet hosts	-	-			
Dialup Internet subscribers	-	-	-	-	-
International bandwidth	-	-	-	-	
Internet / email subscribers	16,000		-	-	-
Internet domains	100	-	-	-	-
Dialup Internet cost	-	-	-	-	-
Local Internet link	-	-	-	-	-
International Internet link (\$month)	-	-	-	-	-
Local phone call cost					
Telephone waiting time/list	n.a				
Internet service providers (ISPs)	-	-11	17	-	100
Mobile operators	2	3	3	3	100
Fixed telecom operators	2	2	2	2	100
Residential main lines	-	-	-	-	-
% Digital main lines	-	-	-	-	-
Public payphones	30	42	42	42	100
Cellular mobile subscribers	12,000	76,000	400,000		
Cellular subscribers per 100 inhabitants	4,248				
Radio paging subscribers					
Estimated facsimile machines					
Videotext subscribers					
ISDN subscribers					
Telex subscribers					
Total telephone traffic					
International outgoing telephone traffic					

Tariffs					
Broadcasting; television receivers	n.a	n.a	n.a		
Television stations	27	27			
Personal computers					
Public payphone licenses			10		
Licensed paging providers	2	2			
Data networks					
VSAT					

## 6.2.2 ICT Infrastructure Projects Inventory

A variety of measures to improve wider access to national ICT infrastructure in Uganda have been formulated and adopted by several actors, including the Government, the private sector, multilateral organizations.

A number of ICT infrastructure projects in Uganda have been identified, among the potentially most important are in the:

- Telecommunication sector, including Internet connectivity
- Computers
- Radio,
- Television,
- Multipurpose Community Telecentres,
- Health
- Education
- Satellite,
- E-commerce,

The country's telecommunication infrastructure is in for substantial change with a number of telecommunication infrastructure building initiatives in the last six years. Most notably those initiated by telecommunication service operators to ensure growth of the network and its associated services.

## 6.2.2 Infrastructure Projects Inventory

### 6.2.2.1 Past Projects Inventory

**Table 9: Past ICT Infrastructure Projects**

Project	Project description	Status
ConnectED	With the support of USAID and the Uganda Communications Commission embarked on a joint training program to enable UCC to take on the challenges of regulation.	Terminated

**Table 10: Present ICT Infrastructure Projects**

Project	Project description	Status
<ul style="list-style-type: none"> <li>Rehabilitation and Expansion of Sound broadcasting by Satellite project</li> </ul>	To establish nationwide coverage using the Frequency Modulation (FM) mode by satellite.	Ongoing
<ul style="list-style-type: none"> <li>Northern Uganda Reconstruction Program (NURP).</li> </ul>	To rehabilitate and expand telecommunication services in northern Uganda districts	Ongoing
<ul style="list-style-type: none"> <li>Community Empowerment Through the Use of ICTs. (Acacia Project)</li> </ul>	Implementing Buwama telecentre, Nabweru telecentre, and Nakaseke telecentre	Ongoing
<ul style="list-style-type: none"> <li>East African Digital Transmission Project</li> </ul>	To enhance interstate transmission links by replacing existing backbone microwave system with state-of-the-art technologies and digitalise the analog portions of the link.	Ongoing
<ul style="list-style-type: none"> <li>GSM Project /UTL Telecel</li> </ul>	Provision of mobile services	Ongoing
<ul style="list-style-type: none"> <li>UTL online</li> </ul>	Provision of high-speed data network services	
<ul style="list-style-type: none"> <li>UTL Rural Tel Project</li> <li>UTL optic fibre project</li> </ul>	<ul style="list-style-type: none"> <li>Refurbishing existing network and attract new customers.</li> <li>Optic fibre cables are being laid</li> </ul>	Ongoing Ongoing

Celtel Uganda	IFC committed US\$ 5.6 million in loans and equity to develop the first cellular network in Uganda	Ongoing
Empowering Women through ICTs in Uganda (Acacia Project).	The project aims to establish an ICT infrastructure –Women Information Resources and Electronic Service (WIRES)-, in Kampala and connect this to two rural sites in Nabweru and Buwama Districts.	Ongoing

**Table 11: Future ICT Infrastructure Projects**

Project		Status
UTL Data Network	Plans are underway to develop a data network system and data nodes in Kampala, Entebbe, Jinja, Mbale, Tororo, Busia	In the pipeline
Celtel Uganda	Plan to upgrade the prepaid system Introduce SMS WAP	Ongoing

### 6.2.3 Sources of ICT Knowledge on the ICT Infrastructures

The study recognizes that primarily as a result of the previous unavailability of significant quantities of ICT related data with which to work, the capability to utilise this data is limited. Moreover, more ICT data will probably become available, due to such developments as the strengthening of the national ICT statistical database, completion of a number of studies, improved data collection capabilities among stakeholders and the establishment of a website for national ICT related data.

There are a few notable web sites, which discuss issues relating to ICT infrastructure broadly but also focusing on Uganda. A significant portion of them are affiliated to international organisations including ITU, ECA, and UNDP, World Bank, IDRC UNESCO and USAID etc, which focus on some of the programs the international communities, are carrying out in Africa, including Uganda.

Existing sources include those shown in Table 12.

**Table 12. Electronic Sources of knowledge on the ICT Infrastructures**

Indicator	Source of Data
Internet Users	<a href="http://www.itu.int/ti/industryoverview/at_glance/Internet99.pdf">http://www.itu.int/ti/industryoverview /at glance/Internet 99.pdf</a> <a href="http://www.uconnect.org">http://www.uconnect.org</a> <a href="http://www.itu/ti/casestudies/uganda">http://www.itu/ti/casestudies/uganda</a>
Internet hosts	<a href="http://www.itu.int/tu/ti/industryoverview/at_glance/internet_99.pdf">http://www.itu.int/tu/ti/industryoverview/at glance/internet 99.pdf</a>
Internet Domains	<a href="http://www.isc.org/ds/www-2000/1/dist_by_name.html">http://www.isc.org/ds/www-2000/1/dist by name.html</a>
Internet access Providers	<a href="http://www.itu.ti/the_list.internet.com/">http://www.itu.ti/the list.internet.com/</a> <a href="http://www.nw.com">http://www.nw.com</a>
Main telephone lines	<a href="http://www.itu.int/ti/industryoverview/at_glance/basic_99.pdf">http://www.itu.int/ti/industryoverview/at glance/ basic 99.pdf</a> <a href="http://www.utl.co.ug">http://www.utl.co.ug</a> <a href="http://www.mtn.co.ug">http://www.mtn.co.u g</a> <a href="http://www.ucc.co.ug/license.htm">http://www.ucc.co.ug/license.htm</a> <a href="http://www.nic.ug/celstel">http://www.nic.ug/celstel</a> <a href="http://www.worldbank.org/ict/">http://www.worldbank.org/ict/</a> <a href="http://www.ifc.org/ict">http://www.ifc.org/ict</a>
ISPs in Uganda	<a href="http://www.uganda.co.ug/internet.htm">http://www.uganda.co.ug/internet.htm</a> <a href="http://www.nsrc.org/db/">http://www.nsrc.org/db/</a> <a href="http://www.nw.com/ug">http://www.nw.com/ug</a> <a href="http://www.nsrc.org/db/">http://www.nsrc.org/db/</a> <a href="http://www.ucc.co.ug">http://www.ucc.co.ug</a>
Universal Access	<a href="http://www.itu.int/itu-D-universal">http://www.itu.int/itu-D-universal</a> Access
Internet	<a href="http://www.worldbank.org/worldlinks">http://www.worldbank.org/worldlinks</a> <a href="http://www3.sn.apc.org/africa/afstat.html">http://www3.sn.apc.org/africa/afstat.html</a>
Cellular subscribers	<a href="http://www.ucc.co.ug">http://www.ucc.co.ug</a>
Acacia Initiative	<a href="http://www.idrc.ca/acacia">http://www.idrc.ca/acacia</a>

### **ICT Information Network in Uganda**

The network is a joint effort of Ugandans involved in ICTs and the International Institute for Communication and Development (IICD) of the Netherlands. It aims at creating a knowledge and information-sharing community on ICT for development in Uganda.

The Network website, which is being developed, will be a focal point for information on ICT projects in Uganda in the public, private and NGP sector, as well as ICT news in the country.

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## 6.3

## Sectoral Applications

**Table: 13 Summary of ICT Possession by Sector North-western region**

ICT/Sector	Education	Public Adm	Health	Commercial	Total
Computers	15	29	9	21	74
Landlines	15	27	6	27	75
Mobile	4	3	1	23	31
TV sets	8	5	7	16	36
Radio sets	12	3	2	20	37
Fax	3	10	1	11	25
VCRs	2	4	3	1	10
Photocopier	5	14	5	10	34
Radio call	1	19	7	1	18

**Table 14: Summary of ICT Possession by Sector eastern region**

ICT	Education	Health	Public Adm	Commerce	Total
Computers	98	23	70	34	226
Landlines	28	20	43	18	105
Mobile lines	28	37	18	33	98
TV sets	18	8	4	25	55
Radio sets	15	5	3	0	27
Fax	2	6	5	11	19
VCRs	2	5	0	6	13
Photocopier	13	4	0	19	40

### 6.3.1. Education

#### 6.3.1.1 Generation description, indicators and benchmarks

##### (a). Introduction

The quality of human resources is a major factor of success for all nations in the new millennium. The move towards globalisation requires a fundamental shift in thinking about the methodology of education. The importance of information, underscores the importance of adopting ICT in the education sector. Most important, transformation in education and learning requires a shift from the traditional methods where one confronts many learners with a textbook to a system where students learn through the use of various media such as:

- Computers,

- The Internet,
- Videos, radios,
- Newspapers,
- Entertainment etc

Modern technologies create the opportunity for the best minds to exchange information across the world. Examples of innovative technologies used in the education process in developed and some developing countries include:

- Video conferencing and
- Multimedia applications

Information and communication technologies (ICT) have already begun to exert massive transformation of education systems in developed countries. Manpower development in the information sector of African countries, including Uganda is becoming necessary in view of technological advances in this area.

### 6.3.1.1.1 ICT Penetration

#### (a). Results from Primary and Secondary School Survey in Kampala

Sample information

The study was carried out in 32 schools, out of which were:

- 16 primary schools and 16 secondary schools
- 27 mixed schools
- 4 girls schools
- 1 boys school only
- Average number of was 1094 in primary schools and 999 in secondary schools.
- Overall average number of students was 1,046, the minimum was 300, and the maximum was 2,948
- Average number of teachers was found to be 40, the minimum was 12 and the maximum number of teachers was 80.

**Table 16: Sample information for Assessment of ICT in Education**

Variable	Maximum No	Average No	Maximum No
Students	2,948	1046	300
Teachers	80	40	12

#### (b). Ownership of ICT Tools in Kampala Schools

**Table 17: Maximum Number, Average and Minimum Number of ICT Tools in Kampala Schools**

Name of variable	Maximum no	Average no	Minimum number
Computers owned	25	6	0
Computers connected	16	1.4	0
Fixed phones	2	1.1	0
Mobile phones			
Radios	4	0.8	0
Televisions	3	0.8	0
Newspapers	17	4	1

From the findings shown in Table 17:

- The maximum number of computers owned by a school was 25 while the minimum was 0
- The average number of computers owned was 6
- The maximum number of computers connected to the Internet was 16, the minimum was 0
- The maximum number of fixed phones in a school was 2, the average 1 and the minimum was 0
- Mobile phones are one of the tools that have gained popularity in a very short time. The maximum number owned was 50, the minimum was 0 and the average was 13. Though mobile phones seemed so popular, some schools, especially government primary schools could not purchase one.
- For schools without phones, it was observed that they had a payphone close to the school (at least 300M from the schools). The reason behind this was that funds were so limited to specific priorities making it impossible for schools to afford phones.
- The maximum number of televisions was found to be 3, average was 0.8 and the minimum was zero.
- A newspaper was the only ICT tool that all schools had purchased. The maximum number of copies a school purchased daily was 4 and the minimum was 1.

© **Computer Ownership in Kampala Schools**

**Table 18: Computer Ownership in Kampala Schools**

Computer ownership	Number (%)	Proportion of computer ownership	
		Primary (%)	Secondary (%)
Own computers	20(62.5)	6(30)	14 (70)
Do not own computers	12(37.5)	10(83.3)	2 (16.7)
Total	32 (100)	16 (50)	16 (50)

Findings in Table 18 showed that out of the thirty-two schools in the survey:

- 63 % owned computers, while 37 % did not
- Out of the 63 % who owned computers 70% were secondary schools. This shows that computers have gained widespread penetration in secondary schools compared to primary schools.
- The majority of primary schools (83%) did not own computers
- Most schools which did not own computers, indicated that cash constraints was one of the significant constraints hindering IT investments
- Heads of primary schools indicated that UPE funds have worsened the situation because they are limited to specific priorities and ICT is not yet a priority. It was however noted that most of the schools, which did not own computers, were planning to purchase at least one this academic year.

**(d). Computer Use Among Students in Kampala**

Results demonstrated that out of sixty three percent of the schools in the survey, which owned computers:

Only 55% of the schools used for academic purposes and the majority have taken ICT as an independent subject not as a tool to aid learning and teaching. Only 3 out of the schools, which owned computers, had used as a tool to aid in teaching and learning. 45 % of them for administrative purposes

- Secondary schools have to some extent utilized computers for both academic and administrative purposes, while primary schools have largely exploited them for administrative purposes.

**(e). Internet Connectivity**

**Table 19: Internet Connectivity in Schools Around Kampala**

Computer connectivity	Number (%)	Proportion of computer ownership	
		Primary number %	Secondary number (%)
Connected	5 (16)	40	60
Not connected	27 (84)	-	-
Total	32 (100)	-	-

Findings presented in Table 19 show that:

- Internet connectivity is at a very low rate in both primary and secondary schools. Out of the 32 schools in the survey, only five were found to be connected, implying that the level of ICT application in education is below the level necessary to attain the transformation required in the sector.
- Connectivity was far too expensive for a school to manage on its own.
- Some head teachers were ignorant about connectivity

**(f). Trends in Computer Purchase**

**Table 20: Trends in Computer Purchase in Primary and Secondary Schools Around Kampala Metropolitan Area**

Year of purchase	Number	%
1996	2	10
1997	1	5
1998	6	30
1999	2	10
2000	9	45

Findings in Table 20 show that:

- Before 1998 only a few schools purchased computers
- After 1998 computers became popular in schools

It is quite evident from the above trend that:

- It can be expected that there will be an improvement in computer use with time
- Many teachers revealed that they had plans to purchase more computers
- Majority of those who did not own computers had plans to purchase them during the year

**(g). Student –Computer Ratio**

Results indicate that on average the student computer ratio was 1: 191, which is too high for students to learn anything. It should be ensured that the student computer ratio in schools allows teachers to teach the skills students need to use computers to their educational advantage.

**(h). Computer Packages Used by Students in Kampala schools**

**Table 21: Computers Packages Used in Schools**

Computer packages used	Number	%
Introduction	5	15
MS dos	6	18
Word	6	18
Excel	7	21
Other (s)	9	28

Schools, which used computers for academic purposes, revealed to make use of the following packages:

- MS DOS
- Word

- Excel
- Others
- 15 % used them for introduction to computer science
- 18% for word processing
- 21 used for Excel and
- 28 % used other packages like office, access and for e-mails

**(i). Phones, Radios, and Television**

Results indicated widespread penetration of other ICT tools like phones, radios, and television sets.

Majority of the schools in the survey (94%) possessed telephones

75 % had radios

69% had televisions

This indicates that an ICT foundation with respect to these tools is already in place in most schools.

**Econometric Estimation**

*(a) Multiple linear regression –Factors influencing computer ownership*

A multiple regression model was used for the analysis. Data used contained both quantitative and qualitative variables. Quantitative variables included:

- Number of students
- Number of teachers

Qualitative (dummy) variables included:

- Type of school (primary and secondary schools)
- Category of school (urban or peri-urban)
- Ownership (government and private)

The dependent variable in the model was the number of computers owned.

Results indicated that:

The coefficient of multiple regression was,  $R^2 =$  implying that the model explained 54% of the variation in the dependent variable.

The variable ownership was statistically significant at 5% and negative. Implying that government aided schools negatively affected computer ownership. It was more likely for private schools to own computers than for government aided schools.

From the model, the variable number of teachers was statistically significant at 1 percent and positive. This implies that:

- The variable number of teachers directly affects computer ownership
- An increase in the number of teachers would mean an increase in the number of computers owned.

- In the model, other variables had no influence on the number of computers owned.

#### 6.3.1.1.4 Users and Usage

### Availability and Use of ICTs in the Education Sector in Selected Upcountry Districts

#### Eastern Region

**Table 22: ICT in the Education sector Jinja District**

ITEM	Number available	Number in use	Respondents
Computers	42	27	5
Landlines	9	7	5
Mobile lines	6	6	5
TV sets	4	4	5
Radio sets	6	6	5
Fax machines	0	0	5
VCRs	2	2	5
Photocopier	0	0	5
Radio call	0	0	5

**Table 23: ICT Availability in the Education sector in Iganga district**

ITEM	Number available	Number in use	Respondent s
Computers	34	31	4
Land lines	6	6	4
Mobile lines	4	4	4
TV sets	10	10	4
Radio sets	0	0	4
Fax machines	0	0	4
VCRs	0	0	4
Photocopier	3	3	4
Radio call	0	0	4

**Table 24: ICT Availability in the Education sector Bugiri district**

ITEM	Number available	Number in use	Respondents
Computers	0	0	2
Landlines	4	3	2
Mobile lines	4	4	2
TV sets	0	0	2
Radio sets	0	0	2
Fax machines	0	0	2
VCRs	0	0	2
Photocopiers	0	0	2
Radio calls	0	0	2

**Sector 25: ICT Availability in the Education sector Mbale**

ITEM	Number available	Number in use	Respondents
Computers	14	12	3
Landlines	5	3	3
Mobile lines	4	4	3
TV sets	0	0	3
Radio sets	0	0	3
Fax machines	0	0	3
VCRs	0	0	3
Photocopier	0	0	3
Radio call	0	0	3

**Table 26: ICT Availability in the Education sector Tororo**

ITEM	Number available	Number in use	Respondents
Computers	8	8	3
Landline	4	4	3
Mobile lines	8	8	3
TV sets	4	4	3
Radio sets	5	5	3
Fax machines	0	0	3
VCRs	0	0	3
Photocopier	0	0	3
Radio call	0	0	3

**South Western Region****Table 27: ICT Availability in the Education Sector Masaka District**

ITEM	Numbers available	Numbers in use	Respondents
Computers	40	15	6
Landlines	9	9	6
Mobile lines	10	10	6
TV sets	6	6	6
Radio sets	14	14	6
Fax machines	0	0	6
VCRs	3	3	6
Photocopier	2	2	6
Radio call	0	0	6

**Table 28: Availability Education Sector Mbarara District**

ITEM	Number available	Number in use	Respondents
Computers	18	18	4
Landlines	7	7	4
Mobile lines	4	4	4

TV sets	4	3	4
Radio sets	5	4	4
Fax machines	1	1	4
VCRs	2	2	4
Photocopier	1	1	4
Radio call	0	0	4

**Table 29: ICT Availability in the Education Sector in Ntungamo District**

ITEM	Number available	Number in use	Respondents
Computers	9	9	4
Landlines	3	3	4
Mobile lines	0	0	4
TV sets	0	0	4
Radio sets	1	1	4
Fax machines	0	0	4
VCRs	0	0	4
Photocopier	0	0	4

**Table 30: ICT Availability in the Education sector in Bushenyi District**

ITEM	Number available	Number in use	Respondents
Computers	14	13	4
Landlines	5	4	4
Mobile lines	5	5	4
TV sets	7	7	4
Radio sets	5	5	4
Fax machines	0	0	4
VCRs	0	0	4
Photocopier	0	0	4
Radio call	0	0	4

**Table 31: ICT Availability in the Education Sector Lira District**

ITEM	Number available	Number in U	Respondents
Computers	16	8	3
Land lines	4	3	3
Mobile	0	0	3
TV sets	2	2	3
Radio sets	2	1	3
Fax machines	0	0	3
VCRs	0	0	3
Photocopier	2	2	3
Radio call	0	0	3

**Table 32: ICT Availability in the Education Sector in Masindi district**

ITEM	Number available	Number in use	Respondents
Computers	14	12	8
Landlines	9	9	8
Mobile	1	1	8
TV sets	4	4	8
Radio sets	7	3	8
Fax machines	2	2	8
Photocopier	1	1	8
Radio call	0	0	8
VCRs	1	1	8

**Table 33: ICT Availability in the Education Sector Kiboga District**

ITEM	Number available	Number in use	Respondents
Computers	3	3	4
Landlines	0	0	4
Mobile lines	1	1	4
TV sets	0	0	4
Radio sets	0	0	4
Fax machines	0	0	4
VCRs	0	0	4
Photocopier	0	0	4
Radio call	0	0	4

**Table 34: ICT Availability in the Education Sector Hoima District**

ITEM	Number available	Number in use	Respondents
Computers	26	23	4
Landlines	4	3	4
Mobile lines	0	0	4
TV sets	2	2	4
Radio sets	4	4	4
Fax machines	1	1	4
VCRs	1	1	4
Photocopier	2	2	4
Radio calls	0	0	4

**Table 35: ICT Availability in the Education Sector Kaberamaido District**

ITEM	Number available	Number in use	Respondents
Computers	0	0	3
Landlines	0	0	3
Mobile lines	0	0	3
TV sets	0	0	3

Radio sets	0	0	3
Fax machines	0	0	3
VCRs	0	0	3
Photocopier	0	0	3
Radio calls	0	0	3

**Table 36: ICT Availability in the Education Sector Nakasongola District**

ITEM	Number available	Number in use	Respondents
Computers	2	1	6
Landlines	1	1	6
Mobile lines	1	1	6
TV sets	0	0	6
Radio sets	0	0	6
Fax machines	0	0	6
VCRs	0	0	6
Photocopier	0	0	6
Radio call	1	1	6

### 6.3.1.2 Project inventory in the education sector

#### 6.3.1.2.1 Past

##### Training and Programs

- **ConnectED** (an EDDI partnership between USAID, the World Bank, the Government of Uganda and the private sector) introduced a national training program for teachers.
- **Women Business Alliance.** Jointly executed by USAID and Kodak to facilitate information sharing on health, business development, and education issues.
- **Cisco Networking Academies Program.** Established by USAID's Leland, EDDI and Cisco Corporation donated the equipment and training content to train several Ugandan specialists in the latest computer networking technologies and practices.

#### 6.3.1.2.2 Present

##### Schoolnet Project

42 participating educational institutions geographically distributed around the country. Aims at connecting to the Internet using VSAT selected schools in the country. The Government of Uganda funds the on going project with a grant from donors.

## 6.3.2

## Health

### 6.3.2.1 General description, Indicators and Benchmarks

#### Introduction

Developing countries, including Uganda can benefit from using information and communication technologies to improve healthcare. ICTs provide opportunities for individuals, medical professionals and healthcare providers to obtain information, communicate with professionals, deliver first-line support and promote preventive medicine programmes. In the developed countries, developments in technology are prompting new initiatives that enable healthcare providers to deliver better support at lower cost. Through ICT applications, there is an enormous opportunity for health-care providers to contribute to better quality health services in Uganda.

It is clear from the experience in the developed world that successful telemedicine requires a change in the organization of health care. Successful use of ICT in developing countries depends on many factors, especially cost, but also on factors such as the availability of appropriate resources and expertise. An important point to keep in mind when assessing the status of ICT application in the health sector is taking place in an ever-changing environment.

#### Situational Analysis of Uganda's Health Sector

Uganda is still in the process of recovery and rehabilitation from several decades of civil strife, which left the health system virtually in serious disrepair. This contributed to a seriously dilapidated health system. Most government health units have generally very low ICT usage due lack of basic ICT infrastructure. The state of disrepair in the health sector, which calls for rebuilding, is characterized by:

- Poor infrastructure
- Low levels of key personnel
- High levels of preventable diseases
- High infant mortality
- Low life expectancy
- High maternal mortality

The Government of Uganda led by the Ministry of Health and in partnership with developmental partners and other stakeholders worked closely during the past two years to develop the Health Sector Strategic Plan in line with the Poverty Eradication Action Plan (PEAP) with the principal aim of improving the quality of delivery of the health package and reduce inequalities between various segments of the population.

The delivery of ICT and services yields many socio-economic benefits, including those derived from national development objectives such as the following:

- Health education of various segments of the whole population;

**Comment [A1]:** ITU: Impact of telecommunications in health care and other social services. (ITU study groups: First study period 1995-1998 report on question 6/2

- Universal care provision and a much broader reach in rural areas
- Employment opportunities for indigenous technicians and paramedics;
- Dissemination of advanced technological knowledge
- Improved health indicators as used by WHO and national governments

ICT activity in many developing countries, including Uganda so far is in the form of pilot projects or demonstrations or used in universities and hospitals. Nevertheless with the rapidly declining costs in hardware and telecommunication, the level of interest and corresponding activity in telemedicine is likely to rise. An important factor to keep in mind is that medicine is conducted in a complex and ever-changing technological and medical environment.

The study of the health sector specifically set out to:

- Assess the extent of ICT penetration in the Health sector
- Identify the level of ICT usage in the Health sector
- Assess the extent to which the use of ICTs facilitates health service delivery is appropriate to the population health needs effectiveness) and with least amount of resources (efficiency)
- Draw the necessary and possible policy recommendations.

The survey was carried on various institutions, which included hospitals, health centres, dispensaries, dispensary-maternity units (DMUs) and health clinics.

A total of 36 health units in and around the Kampala metropolitan area were selected using compute generated random numbers in the Excel computer package. Selected upcountry hospitals and health centres were included in the sample.

**Table 37: Sample Size for Assessment of ICTs in the Health Sector in and Around Kampala Metropolitan Area**

Type of health unit	Ownership			Number
	Government	Private	NGO	
Hospitals	3	3	3	9
Health centres	3	0	0	3
Dispensaries	1	2	3	5
Dispensary-Maternity units	1	2	3	6
Clinics	0	13	0	13
Total number	9	20	9	36

## Definitions

### (i). *Telemedicine*

For purposes of this report, telemedicine is used in a broad sense and is defined as follows:

Telemedicine is the delivery of health-care services, where distance is a critical factor, by health-care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, and for the continuing education of health-care providers as well as research and evaluation, all in the interest of advancing the health of individuals and their communities. Telemedicine encompasses a whole set of practices aimed at increasing well-being, and involves diverse technologies and applications. Many areas of medical practice have potential telemedicine applications.

**Comment [A2]:** This is the definition adopted by an international consultation group convened by WHO in Geneva in December 1997 to draft a health telematics policy for WHO.

(ii). **Telehealth** can be distinguished from telemedicine in the sense that telehealth is the provision of a service to those who are at a distance from the service provider, but who not necessarily ill or wounded, who are already well and want to stay that way by following healthy practices of diet, nutrition, lifestyle, exercise, etc and by taking steps to avoid illness and disease, for example, in regard to sanitation.

**(iii). Telemedicine services**

Although advanced telemedicine applications may require a sophisticated and expensive telecommunications infrastructure, some solutions require only a basic infrastructure to provide basic health-care services. Telemedicine applications can be categorized as requiring either low or medium or high bandwidth transmission. For purposes of this report, telemedicine services can be categorized as being of three main types – based on the transmission of data, audio or images.

**(iv). Data transmission**

A feature of certain types of telemedicine is the transmission of data, whether in the form of relatively static information, such as a patient's medical record, or dynamic information such as vital signs data (e.g. heart rate and blood pressure).

**(e). Telemetry**

Telemetry provides a means for monitoring human and physiological functions from a remote site.

**(f). Information services**

- Hospitals and medical practitioners exchange information such as records of the outcome of treatment
- Use e-mails for administrative purposes
- Employ bulletin boards for up-to-date clinical information and transmit patients records referral letter and test results between general practitioners and hospitals
- Specialised databases
- Fax messages

**(i). Audio**

One of the simplest telemedicine services is the consultation between health-care workers by telephone

**(ii). Images**

Medical images may be still pictures, for example, radiographs, or moving pictures, i.e. video. Much telemedicine image transmission is for the purposes of teleradiology, which is perhaps the most widely used telemedicine service at present.

**Telemedicine technologies**

The range of technological choices includes:

- Basic telephony
- Digital landline
- Cellular/wireless
- Satellite
- Broadband networks such as ATM
- Radio pagers
- VHF radio
- ISDN
- Videoconferencing systems
- E-mail
- The Internet

**Telemedicine services**

**(i). Teleconsultation**

Telemedicine networks offer the opportunity for consultations between doctors and others in health care. Consultation can take place in real time by telephone or by video conferencing. Teleconsultation can also be done offline, using store-and-forward techniques, such as e-mail. Teleconsultation has been described as a special form of clinical information exchange. The simplest example of this application uses only the telephone, i.e. a doctor can ask another doctor for a second opinion using the telephone. Transmission of images via different kinds of telecommunications, mainly videoconferences and data communication is a central issue in remote consultations.

**(ii). Health Information System**

Historically, the national health information system was not as a result of a coordinated effort to address information and communication needs of health planners and managers. Instead, national programmes within the MOH developed their own specialized information and communication systems.

### 6.3.2.1.1. ICT Penetration

#### (a). Penetration of Information and Communication Technologies

Current use of ICT facilities as a critical component in the promotion of improved health service delivery is still open to public debate.

80% of the population is rural based, where electricity distribution has not penetrated, thus constraining the diffusion of all forms of ICT.

#### (b). Computers

**Table 38: Computer Ownership in the Health Sector**

Health unit	Ownership	Gap %
Hospitals	77.7	22.2
Health centres	33.3	66.7
Dispensaries	33.3	66.7
DMUs	33.3	66.7
Clinics	67	33
Average	48.94	51.06

#### The Internet

Internet connectivity in hospitals surveyed is still low as compared to other sectors like business.

- On average 44% of the health units using computers are connected to the Internet
- Internet connectivity in hospitals is at 85.7% while for dispensaries and DMUs is at about 50%.
- In clinics, 37.5% of those using computers are connected to the Internet.
- On average, all health units using computers have at least one computer connected to the Internet.
- At the hospital level, Internet connectivity has been in place for at least three years unlike for health units that have just been connected in the last one-year.

#### Electronic mail

All health units with computers with Internet connectivity are using e-mail

**Table 39: Internet Connectivity and e-mail Penetration in the Health Sector**

Health unit	Level of connectivity	Average no of computers
Hospital	85.7	1
Health centres	0	0
Dispensaries	50	1
DMUs	50	1
Clinics	37.5	1
Average	44.64	1

Findings in Table 39 indicate that:

Internet connectivity and e-mail usage in the health sector falls short of the average displaying a percentage gap of 55.36%. This high gap results from the fact that these ICTs are still a recent development in the economy as a whole.

**(e). Telephones**

All health units surveyed access to both public and private telephone services. This is attributed to the Ministry's policy to have each and every health unit connected with some form of communication.

**(f). Fax**

- Assessments indicate that fax services are more in use in large health institutions
- Findings in Table 39 indicate that there is significant gap in usage of faxes in the health sector. Perhaps this shows that there is growing demand for alternative and modern ICTs that serve the same purpose like the e-mail
- 66.7% of health centres surveyed are constrained by inadequate available development funds while
- 33% believe faxes are not necessary for to their communication needs.
- 58.3% of the respondents in the clinics surveyed have intentions to purchase a fax only that they have budget constraints.
- 41.7% felt it was not necessary.

**Table 40: Fax Penetration in the Health Sector**

Health unit	Level of penetration	Gap (%)
Hospitals	77.8	22.2
Health centres	0	100
Dispensaries	16.8	83.2
DMUs	0	100
Clinics	16.8	83.2
Average	22.28	77.72

**(g). High Frequency Radio Calls (Radio calls)**

Study findings indicate that no health unit uses high frequency radios for their communication needs. But have rather opted for mobile cellular phones.

**(h). Television and Radio Broadcasting**

- Television and radio usage in the health sector is generally limited. Among health units surveyed, only hospitals were found to engage in television and radio broadcasting and these constituted 22%.
- Two major referral hospitals broadcast messages related to their areas of specialization and general health care. The Ministry of Health in conjunction with the hospitals arranges these broadcasts.
- 41.6% of the clinics surveyed use radio and television broadcasts and about 8% participate in or sponsor radio talk shows.

**(i). Penetration Trends in the Health Sector**

- On the overall, besides telephone service ICT penetration in the health sector is quite low
- The longest time a single health unit has used a computers was for nine years; especially among hospital computer use. More specifically Mulago Hospital (the main referral hospital) started using computers in 1991. Recent trends indicate that it has over 39 computer units.
- Privately owned health units cited the high cost of ICT as a constraint to computer acquisition
- Health professional have in the last one-year demonstrated growing demand for Internet services as compared to other forms of ICT a trend that is evidenced by the declining investment in other forms.

**(j). ICT Usage Trends in the Health Sector**

**Computerization**

Many common and useful applications of computers in the health sector have little to do with the development of comprehensive health management information systems. Results from the survey show that:

- All health units use computers for human resources management.
- Only hospitals engage in research. &4% of hospitals with computers use them for research purposes besides
- Accounting,
- Stock taking, or inventory management and human resource management
- Use of the Internet is on the rise in several health units
- Doctors, medical assistants, dispensers most commonly use computers and other non-medical personnel like accountants, and secretaries. 56.1% of the doctors and their secretaries use computers for administrative purposes, while medical assistants and accountants accounted for 43.84 %

## Internet

Internet usage has increasingly become popular due to its comparative advantage over older technologies. Survey findings indicate that:

- All health units with Internet use it for information searches at least once a day.
- 42.8% of the hospitals participate in online discussions while
- 14.2 % have already started posting documents on the web.
- MOH website is not yet fully developed
- Public health units do not have homepages
- Most health units do not participate in online discussion or even post any information on the web.

## Electronic mail

All health units found to have computers are using e-mail. Most respondents believed that it could be the most prospective tool to compliment health service delivery in remote areas.

**Table 41: Internet Connectivity and e-mail Penetration in the Health Sector**

Health Unit	Level of connectivity %	Ave No of connected computers
Hospital	85.7	1
Health centres	0	0
Dispensaries	50	1
DMUs	50	1
Clinics	37.5	1
Average	44.64	1

Table 40 indicates that Internet connectivity and e-mail usage in the health sector falls short of the average displaying a percentage gap of 55.36%. This gap results from the fact that these ICTs are still a recent development

## Telephones

Survey findings indicate that all health units make contacts with their clients by phone. Health units that make contacts with patients stood at 44.4%, 66.7% and 83.3 % for hospitals, health centres, dispensaries and DMUs and clinics respectively.

## Fax

Survey findings indication that the fax is rarely used in the health sector and exhibits low penetration levels. Of hospitals and clinics using fax, only 28.6 % and 50% use fax to communicate with their clients. All health units with fax use it for general correspondence

## Television and Radio Broadcasting

As indicated earlier television and radio broadcasting is normally done under the guidance of the Ministry of Health. The ministry's health promotion and education

activities for the year 1999/2000, it was reported that a total of 34,506 health commercials were aired 9,342 (27%) of which were of cholera, 3, 649(10%) on malaria, 10,565 (30%) were on sanitation, and 10,950 (31%) on polio. In addition weekly and recorded talk show programmes were broadcast on radio and television (Health Policy Statement, 2000/2001).

#### 6.3.2.1.4 Users and Usage

Survey results indicated that:

- The maximum number of computers owned by a single unit in and around Kampala is 53, 5, 3, and 1 in hospitals dispensaries, clinics, DMUs and health centres respectively.
- On average the longest these computers have been in use is three years and the shortest is one year
- 77.8% of hospitals surveyed own computers
- 67% of clinics surveyed own computers
- Levels of penetration for health centres, dispensaries and DMUs all stood at 33.3%.
- On average 48.9% of health units are using computers

Findings in Table 40 indicate that:

- Hospitals have invested significantly in computer technology given the nature of their operations.
- Health units operate under very competitive private health market such that demand for their services heavily depends on how they manage their operations; computerization is increasingly seen as a way of reducing on the costs of operation.

### Summary of Up-country Data

#### Eastern Region

**Table 42: ICT in the Health Sector Jinja district**

ITEM	Number available	Number in use	Respondents
Computers	0	0	2
Landlines	10	10	2
Mobile lines	0	0	2
TV sets	1	1	2
Radio sets	0	0	2
Fax machines	0	0	2
VCRs	0	0	2
Photocopier	0	0	2
Radio call	0	0	2

**Table 43: Health sector Iganga district**

ITEM	Number available	Number in use	Respondents
Computers	1	1	1
Landlines	2	2	1
Mobile lines	2	2	1
TV sets	1	1	1
Radio sets	1	1	1
Fax machines	2	2	1
VCRs	2	2	1
Photocopier	1	1	1
Radio call	0	0	1

**Table 44: Health sector Mbale district**

ITEM	Number available	Number in use	Respondents
Computers	19	17	2
Landlines	5	5	2
Mobile lines	3	3	2
TV sets	4	4	2
Radio sets	2	2	2
Fax machines	2	2	2
VCRs	2	2	2
Photocopier	2	2	2
Radio call	0	0	2

**Table 45: Health sector Tororo district**

ITEM	Number available	Number in use	Respondents
Computer	4	4	2
Landline	3	3	2
Mobile lines	7	7	2
TV sets	2	2	2
Radio sets	2	2	2
Fax machines	1	1	2
VCRs	1	1	2
Photocopier	1	1	2
Radio call	0	0	2

## South-western Region

**Table 46: Health sector Masaka district**

ITEM	Number available	Number in use	Respondents
Computers	6	6	2
Landlines	4	4	2
Mobile lines	1	1	2
TV sets	0	0	2
Radio sets	0	0	2
Fax machines	0	0	2
VCRs	0	0	2
Photocopier	0	0	2
Radio call	0	0	2

**Table 47: Health sector Mbarara district**

ITEM	Number available	Number in use	Respondents
Computers	23	18	2
Landlines	12	8	2
Mobile lines	6	6	2
TV sets	3	3	2
Radio sets	0	0	2
Fax machines	0	0	2
VCRs	0	0	2
Photocopier	0	0	2
Radio call	0	0	2

**Table 48: Health sector Ntungamo district**

ITEM	Number available	Number in use	Respondents
Computers	0	0	1
Landlines	1	1	1
Mobile lines	0	0	1
TV sets	0	0	1
Radio sets	0	0	1

**Table 49: Health sector Bushenyi district**

ITEM	Number available	Number in use	Respondents
Computers	2	2	1
Landlines	1	1	1
Mobile lines	0	0	1
TV sets	1	1	1
Radio sets	0	0	1
Fax machines	0	0	1
VCRs	1	1	1
Photocopiers	0	0	1

Radio call	0	0	1
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**North-western Region**

**Table 50: Health sector Lira district**

ITEM	Number available	Number in use	Respondents
Computers	3	2	3
Landlines	3	3	3
Mobile	0	0	3
TV sets	2	2	3
Radio sets	1	1	3
Photocopier	2	2	3
Radio call	2	2	3
Fax machine	1	1	3
VCRs	2	2	3

**Table 51: Health sector Masindi district**

ITEM	Number available	Number in use	Respondents
Computers	1	1	2
Landlines	3	3	2
Mobile lines	10	10	2
TV sets	1	1	2
Radio sets	1	1	2
Fax machines	0	0	2
Photocopier	1	0	2
Radio call	2	2	2
VCRs	0	0	2

**Table 52: Health sector Kiboga district**

ITEM	Number available	Number in use	Respondents
Computers	4	4	2
Landlines	2	1	2
Mobile lines	0	0	2
TV sets	0	0	2
Radio sets	0	0	2
Fax machines	0	0	2
VCRs	0	0	2
Photocopier	1	1	2
Radio call	1	1	2

**Table 53: Health sector Apac district**

ITEM	Number available	Number in use	Respondents
Computers	2	2	2
Landlines	0	0	2
Mobile lines	0	0	2
TV sets	1	1	2
Radio sets	0	0	2
Fax machines	0	0	2
VCRs	0	0	2
Photocopier	0	0	2
Radio call	1	1	2

**Table 54: Health sector Hoima district**

ITEM	Number available	Number in use	Respondents
Computers	4	4	2
Landlines	4	4	2
Mobile lines	1	1	2
TV sets	3	3	2
Radio sets	0	0	2
VCRs	1	1	2
Photocopier	1	1	2
Fax machines	0	0	2
Radio call	2	2	2

**Table 55: Health sector Kaberamaido district**

ITEM	Number available	Number in use	Respondents
Computers	0	0	1
Landlines	0	0	1
Mobile lines	0	0	1
TV sets	0	0	1
Radio sets	0	0	1
Fax machines	0	0	1
VCRs	0	0	1
Photocopier	0	0	1
Radio call	0	0	1

**Table 56: Health sector Nakasongola district**

ITEM	Number available	Number in use	Respondents
Computers	0	0	1
Landlines	0	0	1
Mobile lines	0	0	1
TV sets	0	0	1
Radio sets	0	0	1
Fax machines	0	0	1
VCRs	0	0	1
Photocopier	0	0	1
Radio call	1	1	1

**6.3.2.2. Project Inventory in Health**

Table 57: Past ICT health Projects

Project	Status

Table 58: Present ICT health projects

Telemedicine Pilot Project	An ITU funded telemedicine project between the University teaching Hospital of Mulago and Mengo Hospital	Ongoing

**6.3.2.3. Sources of ICT Knowledge in Health**

The compilation of a comprehensive source of ICT knowledge in the health sector is another important task for the future.

**Conclusions**

- The application of ICT in Uganda's health service sector is still in its infant stages. The trend is characterized by absence of a comprehensive long-term health plan that takes into consideration the new ICTs.
- Telecommunications can be used to deliver health services, aimed at building the well being of society or improving the general health of society.

- There is little attention dedicated to developing the use of ICT in health care, especially in the public sector. The Ministry of Health is yet to prioritise in the introduction of ICT for health care.
- Telecentres have been identified as the way forward to encourage access to the Internet, and the use of e-mail, especially in rural areas. Since the largest segment of the population is located in the rural areas, it is needful for government to invest in telecentres. Perhaps, this will improve on the work of health service providers located in rural areas.
- The performance of the National Telemedicine project in Mulago Hospital will have a bearing on the popularity, degree and progress of ICT penetration in the health sector generally.

## **Recommendations**

Several recommendations were drawn from key respondents:

On the use of computers, it was recommended that:

Locally recruited computer technicians should be utilized to design all the software customisation and programming. Skilled computer programmers should be used to upgrade health information systems

Computer training of health personnel is necessary so as to develop the human resource capacity and skills.

The Ministry of Health should invest in computer technology at all levels  
Government should abolish duties and taxes in the IT field to make this technology affordable by a wider percent of the population

Awareness and literacy on the usage, purpose and current developments of modern ICTs like the Internet and e-mail is necessary. This should be done through specialized computer training in institutions.

Government should invest more in telecentres and be used as free data processing zones where data from any where in the world can be processed and collected. In rural areas, the services should be subsidized and where possible be offered free of charge given the appalling poverty levels in these areas.

The MOH should improve on and develop its website such that Public health units that can access the Internet are in position to post relevant documents and their individual research work to the web. This will make it more resourceful to the researchers visiting that website.

Basic prerequisites like electricity power supply and telephone networks should be increased to meet the needs and demands of rural areas.

Institutional capacity building is necessary for all institutions that are dealing with any perspective of ICT development. This could be in policy, research or marketing. It is

hoped that this will backstop ICT usage not only in the health sector but also in other sectors.

### 6.3.3. Public Administration

#### 6.3.3.1 General description, indicators and benchmarks

A descriptive survey was carried out on 29 government institutions that were randomly selected. The main objective of the study was to determine the status of use of ICTs in government institutions.

##### 6.3.3.1.1 Indicators

- Total number of government institutions with ICTs (by type of ICT and department)
- Number of government institutions with LAN
- Government workers who use ICTs by type
- Uses of ICTs by type
- Level of ICT literacy in the government institutions
- Number of government institutions that are connected to the internet
- The number of government institutions with a website
- The typology of information on the websites
- Typology of functions that can be completed using the Internet if any (e.g. voting, car registration)

##### 6.3.3.1.2 The Status of Use of ICTs in Government Institutions in Uganda

**Table 60: Comparative Summary of the Telecommunications Sector 1998-2000**

Service provided	October 1998	October 2000
Wired telephone lines (UTL)	55,749	59,405
Fixed telephone lines (MTN) (50 corporate customers with 30 lines each)	0	1500
Fixed wireless payphones	0	447
Mobile cellular operators	3	3
Mobile cellular subscribers	<10000	146,550
Public payphone licenses	7	19

*Source: Uganda Communications Commission (UCC) 2000*

In 1997, Uganda liberalised its telecom sector. This saw the licensing of a Second National Operator (SNO) in addition to the non-core telecom services providers. Under this license the SNO is required to cover the entire country, provide 2000 pay phones, provide for 89,605 subscribers and offer a full spectrum of telecommunications including an international gateway within five years. Therefore, the current telecommunications has in place, 2 national telephone operators and 3 mobile telephone operators. The three major telecom providers (UTL, CELTEL UGANDA and MTN) currently have the country quite sufficiently covered. This

greatly increased the tele-density of the country from 0.27% in 1997 to 0.87% in 2000<sup>17</sup>.

### Internet Infrastructure

Once telephone densities are high it is possible to offer Internet access to most users. However, beyond the physical infrastructure, providing wide Internet access requires the emergence of local Internet Service Providers (ISPs) and portals that can arrange reliable access to the Web. The favourable telecom sector has led to the growth of ISPs in Uganda from 3 in 1998 to 11. The competition between the growing numbers of ISP has led to lower access costs that have resulted to a larger number of individuals getting connected to the net. Currently, Internet subscribers have grown from 3,000 in 1998 to 5,698 in 2000. The bandwidth that is currently offered by most Internet service providers ranges between 33kps to 64 kbps. However some service providers offer access with a bandwidth that can go up to 512 Kbps.

(d). ICT Penetration in Government Institutions.

**Table 61: Results of Study Showing ICT penetration in Selected Organizations**

Particular	Percentage
Own computers	100
Intercom	90
Fax	90
LAN	46.7
Possess Internet Connection	80
Type of Internet Connection	
Dial-up	
Wireless	
Possess a website	40
	60
	50
N = 29	

#### (i). COMPUTERS:

- All the institutions reviewed had computers. However, the range between the highest and the lowest number of computers owned by the different institutions was very big. One was the lowest number of computers owned by an institution while the maximum number of computers owned by an institution was over 300<sup>18</sup>.
- The majority of the respondents (95%) indicated that the computers owned were inadequate. Among the reasons given for the inadequacy of computers owned were; inadequate funds to acquire more computers, computer illiteracy of employees especially top executives and thus are not compelled to push for computerisation of activities, lack of commitment among the top executives of

<sup>17</sup> Details of the telecom infrastructure can be obtained from the telecommunications infrastructure report by UNCST, 2001.

<sup>18</sup> Details of computers owned and they are used for per institution can be found in section 3.4

the institutions. 86.7% of the institutions had computers in all the departments of the institution.

- However, it was also observed that for some of the institutions, computer presence in a department meant providing a secretary with a computer to be used mainly for word processing.
- All the institutions used the computers for word processing however, 13.3% of the institutions used the computers for word processing only. In addition to word-processing 86.7% employed computers for their accounts system. 70% had developed other databases for their activities these included; personnel databases, Geographic information systems (GIS), EIS, WIS

#### **TELEPHONE:**

- It was observed that 90% of the institutions had the intercom facility that was used to communicate among the different offices of the institutions.
- The other 10% only had a central place to make calls and one had to move from one department to another for communication. This was seen as an inefficient way of carrying out functions especially now that the country and the world is becoming more computerised.

#### **FAX:**

- The majority of the institutions had faxes however, it was also observed that for 50% of the institutions had their faxes located in the top officials' offices and were not actually accessible to all workers. The telephone and fax were the major forms of communication among the different institutions.

#### **LOCAL AREA NETWORK (LAN)**

46.7% of the institutions had networked their offices to coordinate and monitor activities among different departments/offices. This allows easy access to information by different offices and ensures the automation of a substantial part of transfer of files and paper hence considerably minimising loss of data.

#### **INTERNET:**

- 80 % of the institutions had computers connected to the Internet and of these 60% of them were wireless connections while 40 % were dial up connections. Wireless connection are preferred because they are cheaper in that for a single fee so many computers can be connected and internet can be accessed all the time. Where as the dial up connections has an element of double payment where one has to pay to telephone operators and Internet service providers for every computer connected. Thus hours spent on the Internet are usually limited so are the computers that are connected to the Internet.
- 50% of the institutions reviewed also had a web presence that was mainly used for public awareness. Most had a platform for public participation on their feed back form. Information on the websites included; information about the

institutions, their functions, reports, statutes of their formulation, rules and regulations, feed back forms, contacts<sup>19</sup>,

**Table 62: State of Usage of ICTs by Government Employees.**

Item	Percentage of workers				
	All	Half	A quarter	Less than a quarter	None
Computer	46.7	26.7	3	20	-
Internet	20.3	9	3	43.7	20
Fax	10	22	15	40	10
Telephone	90	6	4	-	-
N = 29					

- Study findings revealed that the all-professional employees in 46.7% of the institutions had access to the computers however not all employees used the computers this was mainly because they were computer illiterate.
- 26.7% of institutions only allowed half of the employees to access the computers. Regards to internet connection, 20% of the institutions allowed all the employees access, 9% allowed only half and 3% allowed only a quarter, 43.6% allowed less than a quarter and 20 % of the institutions had no internet access at all.
- Reasons for low level of internet access for most of the employees included; low infrastructure, lack of know how of use by most of the employees, for some institutions the computers that where connected were only accessible to top executives in the institutions, and for others the time to access the internet was limited especially for those with dial up connections.

## ICT Penetration

### The ICT Initiatives in Each of the Institutions Reviewed.

#### 1. Ministry of Finance Planning and Economic Development

- Ministry of Planning and Economic Development had over 200 computers and all the departments had been computerised.
- All the workers had access to the computers.
- It has in place IT qualified personnel who deal with all IT matters in the institution.
- All the departments were connected to intercom and fax services.
- The ministry had a computer service department for electronic data processing and providing technical guidance in information systems to all government institutions.
- The department was well-equipped and offered in-house training for personnel in the ministry.

<sup>19</sup> Details of the information on the different institutional websites can be found in section 3.4

- Some of the computers had a wireless Internet connection that all workers had access to and used for research and e-mail communication.
- The institution had developed many data bases according to the different activities that were going on in the ministry for example the accounts had their data bases, economists had data bases on economic indicators, poverty indicators, fiscal planning, personnel data, etc.
- The ministry regularly updated its website [www.finance.co.ug](http://www.finance.co.ug) that had information about what was happening in the ministry.
- Information on the website included; budget speeches, budget brief background, budget implementation, policies initiatives, programs and projects in the ministry, feedback forms for any questions or information sought from the public. These were usually answered among the frequently asked questions.
- The website also had made provisions where comprehensive publications could be down loaded from their office down load centre. Here their Microsoft office documents can be shared with people who have versions of office programs that are different from their own.
- Plans were underway to implement the Second Economic and Financial Management Project (EFPMP II) in the ministry where provisions had been made to develop capacity of the workers in professional and computer skills.
- There were plans to set up a LAN in the whole ministry to enhance the capabilities There were plans to set up a LAN in the whole ministry to enhance the capabilities of sharing information.
- There were also proposals under the MoFPED EFMPII to set up computerised linkages between the Ministry of Finance Planning and Economic Development and other ministries to ensure effective fiscal and financial controls.

## **2. The National Social Security Fund**

- The National Social Security Fund had about 70 computers;
- had telephone intercom and fax facilities.
- It had a computer room where all interested workers had access to them. However most were not interested in using computers or were computer illiterate and had not made any initiative to learn how use them.
- All the institutions offices had been connected to a common secure server to access information from all offices.
- More robust databases had been installed to ease the work these include; accounts, human resources and operations.
- The institution had a wireless Internet connection to some of the computers however only a quarter of the workers had access to the Internet.
- The institution did not have a website. Yet it is an institution that interacts more with the population.
- Most of the information about the institutions activities was broadcast on radio.

### **3. The Health Service Commission.**

- The health Service Commission had only 5 computers. The reason for their inadequacy was lack of funds.
- Less than a quarter of the workers had access to the computers in fact only secretaries used them for word processing.
- It had no Internet service, no LAN, no website.
- However it had a telephone intercom and a fax in the top official's office.
- The institution did not broadcast only used newspapers in case of any information dissemination.
- However an indication was given that the commission was in the process of acquiring new computers and hoped to computerise its applications if its budget was approved.

### **4. The General Registrar's Office**

- It had about 8 computers;
- It had no fax and intercom service.
- All the offices at least had a computer.
- All professional staff had access to computers even though only a quarter of them used the computers. The rest were computer illiterate. Their main purpose was record keeping, accounts and word processing.
- The institution had no Internet and no LAN. There was hope that a LAN would be in place to replace human activity from moving files from office to office for verification.
- The institution was in the process of identifying its computer needs and there was an indication that all was in place to install and train workers in addition information officers had been employed to automate most of the processes at the institution.

### **5. Ministry of Local Government**

- The Ministry of Local Government had about 30 computers and these were not adequate.
- At least all the departments had computers.
- Less than a quarter of the workers had access to these computers.
- Computers were mostly used for accounts, word processing.
- Only a few computers were connected to the Internet and the type of connection was a dial up connection. Only the top officials computers were connected to the Internet. Thus Internet access by the rest of the staff was restricted. They were mostly used for e-mails communication. It was important to note that even the principal information officer did not have Internet on his computer.
- There was no LAN except for the telephone intercom facility.

### **6. The Uganda Communication Commission**

- The Uganda communication commission had about 23 computers. All departments had computers and all workers had access to them.

- Computers were mostly used for accounts, spectrum monitoring, other databases,
- All computers were connected to the Internet and all workers had access to the Internet.
- It also had a LAN network in all the offices.
- All the offices had an intercom connection and fax. It had managed to fully automate its activities in the 3 years it had been in existence.
- It had a website [www.ucc.co.ug](http://www.ucc.co.ug) that had information about the institution, about Uganda's telecom sector, postal sector, about getting a licence to operate in the industry, its objectives, how to contact them, some of the application forms could be down loaded and filled in, licence application process, contacts of licensed service providers, however the payment system was not in place since e-commerce has not yet taken off in this country. The website had a feed back mechanism for queries and questions.

#### **7. The National Environment and Management Authority**

- It had about 35 computers. All the departments had computers and all workers had access to the computers.
- Computers were used for word processing, accounts, Geographical Information Systems (GIS), Environment Information Systems (EIS) and many other information systems like in the library. The institution had computers in their regional offices where databases on the environment were kept.
- All the computers had a wireless connection to the Internet and all workers had access to the Internet.
- The institution had a website [www.nemaug.org](http://www.nemaug.org) that has information on the institution, their policies, contact offices in all regions of the country, feedback forms.

#### **8. Ministry of Water, Lands and Environment**

- The Ministry of Water, Lands and Environment had 35 computers that were distributed in all the departments however;
- Only a quarter of the workers had access to them.
- They were used to automate the accounts system, for record keeping especially the human resource, word processing.
- They had a wireless Internet connection of the computers in the computer room. This is used by less than a quarter of the workers.
- The institution had a website [www.mwie.go.ug](http://www.mwie.go.ug) and a LAN connection where internal reports were easily accessed by all offices. Contents of their website included: information about the institutions, their mandate, policies, divisions under the ministry and their functions, contact, and feed back forms.

#### **9. Wetlands Division**

- The department had about 20 computers distributed in all the offices and
- All workers had access to them. Even support staff were encouraged to use computers by making sure some of the activities are only carried out on the

computer for example, application for leave of absence, updating of staff records and most notices were sent by e-mail.

- They had developed appropriate data bases these included accounts, National Wetlands Information Systems, personnel records these assist in quick decision making.
- They had a wireless type of connection and all workers had access to the Internet.
- They had a LAN where information was easily shared among the different offices.
- It had no website however any information about the institution was posted on the parent ministry's website that is [www.mwie.go.ug](http://www.mwie.go.ug). However Plans were underway to create their own website

#### **10. The Judicial Commission**

- The institution had 5 computers distributed among all offices.
- Only less than a quarter of the workers used the computers
- However, for most offices they were used by secretaries for word processing and emails,
- Four of the computers were connected to the Internet by a dial up type of connection.
- The institution had no website and no LAN.
- It had a fax machine and had an intercom facility. Had databases on records.

#### **11. Uganda Investment Authority (UIA)**

- UIA had 35 computers;
- Had a LAN-based integrated management information system. The system aids in determining projects and land available databases. Investor tracking and client relationship management, it had intranet business operating conditions package, financial information systems based on pastel software, Library databases plus online subscriptions to international investment related publications.
- A well managed and very resourceful website with many automated tasks related to investment. It had a website [www.ugandainvest.com](http://www.ugandainvest.com) that includes information on the institution, its functions, background information on Uganda, investment opportunities, procedures.

#### **12. Ministry of Foreign Affairs (MOFA)**

- MOFA owned about 20 computers distributed among all the departments of the institution.
- The majority of the workers had access to the computers that were mainly used for word processing; the institution has in place databases on personnel controls and statistics, information on missions abroad, other records and accounts. The institution had embarked on training staff to become computer literate since it was observed that the majority especially the top officials are computer illiterate.

- Only three of the institutional computers were connected to the Internet this was a dial up connection and these were located in the top executives offices. However, there was an indication that there was a project in place to connect all offices.
- Currently the Internet is used mainly for e-mail communication.
- The institution had no LAN nor a website.

### **13. Parliament of Uganda**

- The parliament had over 90 computers distributed among all the departments.
- All the professional staff had access to the computers they were used for word processing, accounts data bases, library supporting data bases, research data bases on different issues like economic issues, personnel,
- They had a LAN that enables easy access and transfer documents among offices,
- Had a website [www.parliament.go.ug](http://www.parliament.go.ug) where most of the functions and all information on whatever is happening in the parliament was found, information on different matters being debated and the public was invited to participate using the feed back form where the public send questions and suggestions to the parliament. These were answered regularly among the frequently asked questions.
- About 40 of the computers were connected to the Internet those MPs and all staff had access to.
- Computer courses for the new MPs as well as new staff to the parliament were regularly organised.

### **14. The Ministry of Justice and Constitutional Affairs**

- The Ministry of Justice and Constitutional Affairs had approximately 30 computers distributed among all the departments of the institution.
- All workers had access to computers. However only half of them used the computers the main reason for their none use is lack of know how by most staff members. They were mainly used for developing personnel databases, library, record keeping, and automation of registry.
- The website [www.justice.go.ug](http://www.justice.go.ug) had information about the institution, its functions, the organisational structures, the profile, directory of bills and white papers, case reports, contact ministries, feedback forms for any questions asked these were answered among the frequently asked questions.
- The ministry had no LAN even though it is evident that it is necessary. The main reason given is lack of funds however the underlying factor is lack of interest and knowledge and the importance of the system.
- They had intercom and fax facilities.
- The computers were not connected to the Internet. The ministry had employed information scientist to computerise the activities like the personnel, registry, and civil litigations. All proposals had been approved and wait for funding to take off.

### **15. Ministry of Tourism Trade and Industry**

- The ministry owned 16 computers distributed among all the departments.
- Only half of the workers had computers that were used for word processing, accounts, analysis and databases.
- There was a wireless Internet connection of some of the computers however only less than a quarter of the workers had access to the Internet. A few computers were also networked.
- The institution had no website.

### **16. Education Service Commission**

- The Education Service Commission had 5 computers that were only used by secretaries for word processing.
- Only one of the computers had a dial up connection to the Internet and this was used by less than a quarter of the workers.
- The institution had no website, no LAN, no IT personnel in place to manage the computers the administrator who is computer illiterate was in charge of any problems or consultations about the computer applications.
- Plans were underway to automate the accounts registry and the staffs in those sections were on training

### **17. Ministry of Education and Sports**

- The ministry of education and sports had more than 100 computers distributed among all the departments of the institution.
- All workers had access to the computers.
- Most of the activities had been automated.
- The ministry had a wireless Internet connection of 30 computers that were used by only half of the workers. They had a resource centre that used MIS for record keeping.
- They had employed data technicians; information and communications officers with knowledge in information technologies who had managed to automate many activities.
- They had in fact put in place an EMIS that provided up-to-date information on the performance of the education sector.
- In addition to the phone, fax and media, the ministry used its Website [www.education.go.ug](http://www.education.go.ug) to communicate and disseminate information from the institution to their recipients. The content of the website includes. The ministry was at a stage of procurement of funds to install LAN only some of the offices had intercom facilities.
- There was an EMIS where 2 computers per district are to be procured 1 for each municipality. All district workforces had been given hands on training in office automation. Intention was to provide at least 8 hrs of telephone on Internet for communication.

## **18. Office of the Prime Minister**

- All departments had access to computers.
- However only a quarter of the workers used the computers for word processing, databases spreadsheets.
- A few computers had dial up connection that is used by less than a quarter of the workers.
- One of the departments had LAN.
- Only the ministers had fax machines the institution had employed information analysts who had designed databases that were used to analyse information. Networking environments for easy access of information was created more computers were to be purchased.

## **19. Ministry of Internal Affairs Headquarters**

- The ministry has 10 computers distributed among all the departments.
- However, secretaries mainly used these for word processing.
- The accounts section was the only adequately equipped department.
- Only the ministers' computers had Internet connection. It was also noted that each of the ministers' offices had two sets of computers. One for the minister and the other for their secretaries and the Internet was connected to the ones inside the ministers' offices thus Internet was only accessible to the ministers.
- The institution never had a website, nor a LAN.
- The fax machines were also located in the ministers' offices.
- The institution had an intercom facility.

## **20. Immigration Department Kampala**

- The immigration department had 11 computers however these were not adequate. An indication was that the department heads had no interest and commitment towards developing the ICT infrastructure in the institution.
- Half of the departments had computers and less than a quarter of the workers had access to them. They were mainly used for data management.
- The institution had a website [www.immigration.go.ug](http://www.immigration.go.ug).
- The institution had no LAN due to inadequate funds and limited computer infrastructure. Efforts were made to automate the strong room where passports are printed. The registry had two computers for entering data for immigrants. However the rest of the activities are still manual that lead to delays in processing applications.

## **21. Land Commission**

- It had only one computer that was used by the commissioners secretary the computer was used for word processing all the other work and records were done by paper work.
- There is no Internet, no intercom facility nor fax.
- The methods of dissemination were by use of newspapers and radios. The inadequacy of funds had prevented the institution to move forward.

## **22. Public Service Commission.**

- The institution had 10 computers. These were not adequate.
- However all the departments had computers and all workers had access to computers. The institution had a pool where some of the staff go and do their work.
- The computers in this pool were connected to the Internet. The computers had been used to automate most activities and databases created include Personnel data files and accounts.
- Together with the ministry of public service they are in the process of establishing a personnel database for the entire civil service that will be available on their LAN. There propositions to acquire an integrated personnel and payroll system (IPPS). That will be shared among all government ministries. It was part of the plan to decentralise payrolls.

## **23. Ministry of Gender, Labour and Social Development**

- The institution owned 54 computers distributed among all the departments.
- The computers were inadequate, only half of the workers had access to them.
- About 6 computers had dial up connections that was used by less than a quarter of the workers.
- The institution had a website [www.genderuganda.go.ug](http://www.genderuganda.go.ug). The computers were not networked. Data banks on specific rights according to ministry needs had been created. They have carried out a needs assessment for MIS for the ministry. There had been awareness drives in the institution on how to use information related facilities

## **24. Forestry Department**

- It had about 20 computers that were divided among all section and projects.
- Only half of the workers had access to the computers a few had a dial up connection. The computers were used for accounts, research, and word processing.
- Less than a quarter of the workers used the computers. All offices were connected to an intercom facility. The donor funded projects in the departments had tried to automate the activities however, the main stream ones lack most of these facilities most of the projects have developed their own data bases however these are now shared easily among the different sections the main hindrance being the lack of LAN. The human capacity and financial capacity were also inadequate.

## **25. Uganda Revenue Authority**

- It had over 300 computers and all the departments had computers. However these were used by only half of the staff. Most of the activities were automated these include payroll; motor vehicle licensing, VAT and PAYE processing packages are in place, the ascuda customs package. However not all departments were equally distributed with computers. The income tax

departments still depended on manual analysis and paper work record keeping since they needed physical verification and human judgement of some of the activities.

- The institution had up to 2000 employees all of which did not have access to computers.
- Some computers were on a wireless Internet connection in some departments while others only had dial up connections. Only half of the workers had access to Internet in the office.
- Some departments were on LAN like the IRD same as some districts.
- The institution has a website: [www.ugrevenue.com](http://www.ugrevenue.com). There were proposals to get a data warehousing WAN to consolidate work. Thus the institution had employed IT professionals to automate the systems there was a division in research and development involved in systems development, maintenance and all computer needs. There was a proposal in place to ensure payments be made in any bank to reduce delays. VAT, pay as you earn, customs reliable taxpayers where rates are clearly defined getting in processes to access pay send info on computer to ease processes.

## **26. Uganda National Council for Science and Technology**

- The Uganda National Council for Science and Technology had about 13 computers shared among the professional staff. The accounts section is fully automated.
- The institution had a website [www.uncst.go.ug](http://www.uncst.go.ug). Where information about the institution, its functions its mandate, contact and publications can be found. Also forms and procedures for application for research permits can be down loaded filled and sent via e-mail or fax.
- The institution had a telephone intercom and fax facilities however it had no LAN.

## **27 Electoral Commission**

- The institution owned up to 300 computers distributed among all the departments. However they were inadequate. The reason for their inadequacy was inadequate funds.
- Only half of the workers had access to the computers the departments that were fully automated included: The accounts, the national registry, and election management.
- Not all computers were connected to the Internet however all was in plan.
- A LAN had been installed to enable easier sharing of information among offices.
- All the offices are had the intercom.
- Some offices have fax facility.
- The institutions had a website [www.imul/interim](http://www.imul/interim) however it is not frequently updated.

## 28. The Inspector of Government

- The institution had up to 63 computers distributed among all the departments of the institution and these were used by a quarter of the employees.
- The institution had been able to automate the accounts; the registry, pay roll and other records databases had been created.
- The institution had a few computers connected to the dial up Internet connection.
- It had a website [www.igg.go.ug](http://www.igg.go.ug). The institution had a telephone intercom, fax. The institution had contracted a firm to carry out a needs assessment for computerisation.

## 29. The Uganda Human Rights Commission

- The Uganda Human Rights Commission had up to 58 computers that were distributed among all the departments of the institution.
- All the workers had access to the computers and these were used for word processing and development of databases for record keeping, accounts.
- The institution had all its computers connected to the Internet and all the workers accessed this.
- The institution also had LAN and a website [www.uhrc.org](http://www.uhrc.org).

### 6.3.3.1.2 Investments and Spending

There investments in Public Administration were in form of donor grants but there were no investments identified in government budget line items.

### 6.3.3.1.3 Contents

**Table 63: Ministries' websites**

Ministry	Website	Contents
Ministry of Finance	<a href="http://www.finance.co.ug">www.finance.co.ug</a>	Finance, budget, fiscal news, etc
Ministry of Water Lands and Environment	<a href="http://www.mwie.go.ug">www.mwie.go.ug</a>	Water resources, environment issues, etc
Ministry of Education and Sports	<a href="http://www.education.go.ug">www.education.go.ug</a>	Education news, policy, exams
Immigration Department	<a href="http://www.immigration.go.ug">www.immigration.go.ug</a>	Immigration rules and regulations
Ministry of Gender, Labour and Social Development	<a href="http://www.genderuganda.go.ug">www.genderuganda.go.ug</a>	

**Table 64: Parastatals**

Parastatal	Website	Content
Uganda Revenue Authority	www.ugrevenue.com	To taxation laws and regulations
National Environment Management Authority	www.nemaug.org	Institutions, policies and feedback forms
Uganda Investment Authority	www.ugandainvest.com	Investment opportunities and procedures

## 6.3.3.1.4 Users and Usage

**Table 63: State of ICT Usage by Government Employees in Kampala Metropolitan Area**

Item	Percentage of workers				
	All	Half	A quarter	Less than a quarter	None
Computer	46.7	26.7	3	20	-
Internet	20.3	9	3	43.7	20
Fax	10	22	15	40	10
Telephone	90	6	4	-	-

N = 29

**6.3.3.2 Project Inventories in Public Administration**

**ExecNet** USAID brought high-speed internet and wireless links to the Executive Office of the President to link up with executive office colleagues in other African countries, and is working with them to build “Virtual” Citizen Hotlines and other democratic governance practices.

## 6.3.3.3 Sources of ICT knowledge in the public administration

The study did not identify specific indigenous sources of knowledge on ICTs in Public Administration but there were sources of information and data on ICTs in Public Administration from elsewhere.

## 6.4. Information Economy

### 6.4.1 General Description, indicators and benchmarks

ICTs are shaping the global landscape and their increased use and development plays a major role in any country's economic and social development. The increased use of ICTs has given rise to a new type of economy, the information economy that translates to the global economy. The information economy refers to the economic contribution of a number of industries in an economy by the production of goods and services using information and communication technologies.<sup>20</sup> This type of economy is one of the most dynamic and profitable areas of the world economy. Promotion of ICTs is important as they have significant contributions on individual sectors of any economy as well as on the whole macro economic performance. The effective use of ICT underpins the international competitiveness of almost every business and industry. It is central to the education sector, health care, leisure, entertainment, government and other economic and service sectors.

Skyme<sup>21</sup>. Outlines some characteristics of the information economy that make it differ from the traditional economy, these include:

1. The economics in the information economy is not of scarcity, but rather of abundance. Unlike most resources that deplete when used, information and knowledge can be shared and actually grow through application.
2. The effect of location is diminished. Using appropriate technology and methods, virtual market places and virtual organisations can be created that offer benefits of speed and agility of round the clock operation and global reach
3. Knowledge enhanced products or services can command price premiums over comparable products with low embedded knowledge or knowledge intensity
4. Knowledge when locked into systems or processes has higher inherent value than when it can walk out of the door in people's heads
5. Human capital competencies are a key component of value in knowledge-based company, yet very few companies report competency levels in annual reports. In contrast downsizing is often seen as positive cost cutting measure.

#### **(b) Indicators and Benchmarks**

According to the SCAN-ICT terms of reference information economy addresses the specific economic/industrial dimensions of ICT: ICT industry, investment and capital, electronic commerce, business formation, private sector development and the related aspects. The kinds of indicators to consider include:

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<sup>20</sup> ECA/ADF Theme Paper on Globalisation and Information Economy: Challenges and Opportunities for Africa.

<sup>21</sup> David Skyme 1997 the global knowledge economy and its implications to business

- Number of ICT firms available in the country i.e. hardware, telecom, software, and professional services.
- The type of professional services available include:
- Ownership of structures state or private
- Average number of employees of ICT firms.
- Number and level of ICT investments.
- Capitalisation of the ICT firms
- Sales, revenues and profitability.

#### 6.4.1.1. The ICT industry

##### (a). Socio-Economic Background of the Ugandan Economy

It is a land locked country in East Africa covering an area of 235,88km<sup>2</sup> the population is approximately 23 million. The Ugandan economy mainly depends on agriculture, which contributes 42.1% of the GDP<sup>22</sup>. However the share has declined over 10% since 1990. The manufacturing and construction accounts for 15% of the economy while services contribute a third of the GDP of which the communication share is 0.5%

A summary of some macro economic indicators are as shown in the table below

**Table 65: Macro Economic Indicators of Uganda**

Fiscal Year	1996/97	1997/98	1998/99	1999/00	2000/01
GDP (millions she)	2,982,180	3,143,090	3,386,643	3,546,696	3,724,116
Per Capital GDP (shs)	149,034	152,986	160,664	164,105	168,268
GDP Growth Rates	4.5	5.4	7.7	4.7	5.0
Per Capital GDP	1.7	2.7	5.0	2.1	2.5

*GDP is at factor cost at constant prices (1991)*

*Source background to the budget 2001/02*

A growth rate of 5% was experienced in the financial year 2000/01 this has been attributed to strong growth in the non-coffee sectors and service sectors notably electricity, telecommunication and construction. In fact growth was projected to be highest in the transport and communications (9%) followed by construction (8.5%) and electricity and water (7%). The growth in transport and communications was mainly attributed to the telecommunications sub sector this was due to increased access to mobile cellular, Internet and fixed telephone services. Growth in the manufacturing sector remained low.

<sup>22</sup> Background to the Budget 2001/02

#### 6.4.1.1.1 Overview of the ICT industry.

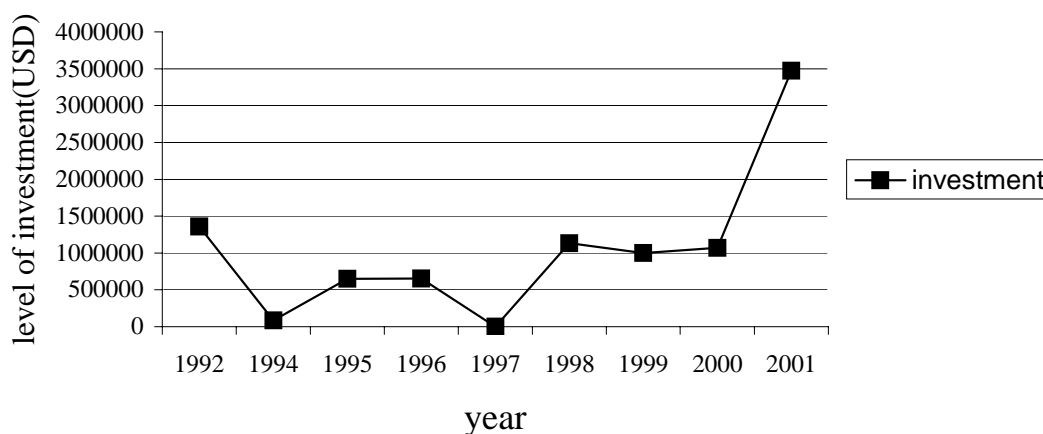
(a). The ICT industry encompasses the ICT manufacturing activities and ICT services activities. The ICT manufacturing activities include production of:

- Computers,
- Telecommunication appliances
- TV
- Radios

(b). ICT services refer to the wholesale of ICT products, telecommunications, consultancy services, and renting of equipment as well as software development and consultancy.

- The Ugandan ICT industry comprises only the ICT service category since there are no ICT manufacturing activities.
- Consequently, the ICT products sold in the country are imported.
- Uganda's ICT industry is liberalized and the radical changes in the sector and the economy as a whole has had a profound impact on the industry.

**Level of Investment Projects in ICT 1991-2001**



- The industry has substantially grown in the past five years and the sector has become an important part of the economy

A total of 21 projects have been registered in the ICT sector and are have been expected to invest up to US\$10,328,577 with a potential employability of 677 people excluding the telecommunication sector<sup>23</sup>. However, the actual investments and the re-investment are not yet known and statistics was not yet got from BOU. Figure 1 shows the trend of investment in this sector over the period of 1991-2001

Source: Uganda Investment Authority

<sup>23</sup> Uganda Investment Authority

#### **6.4.1.1.2 ICT Players**

The sector includes:

- Two national telecommunication operators,
- Three mobile telecommunication companies,
- Internet service providers,
- Computer vendors and their accessories,
- Software vendors,
- Internet cafes,
- Other professional services like repairs, web designs, hosting, and consultancies.

The expansion of these companies may be attributed to the gradual diffusion of computer systems throughout the economy. These have mainly penetrated the large firms, universities, schools, government institutions, and hospitals. They have also penetrated medium size companies; professionals like lawyers, doctors, and few have gotten into houses for individuals use. There is also a continued realization of the people making decisions on investments in both private and public sectors that information technologies present great potentials to enhance productivity and hence are a profitable investment. Information technologies have been used under a notion that they are an important cost-saving factor.

#### **6.4.1.1.3 Hardware Sector**

- There is no IT manufacturing firms in Uganda.
- The industry consists of small wholesale and privately owned companies.
- Most of these are agents of manufacturing companies in developed countries.
- Data collected indicated a number of shops selling computer hardware (71.4%) all of whom were involved in repairing of computers,
- 28.5% of them offered training in computer applications and 64.3% were also involved in the sale of software.
  
- Most of the vendors visited indicated that the computer market was still in its infancy this is so especially since the GDP per capital income in Uganda is only 168,268 shillings.
- Majority of the population cannot afford their own computers.
- However there are more and more businesses getting aware and appreciating the opportunities presented by these technologies. They are a major cost saving factor and they increase the productivity of businesses.

#### **6.4.1.1.4 Software Sector**

Companies involved in the computer software business and professional services have also steadily grown (28.5%) of the companies provided professional services and software sales. For most of these, the services provided included consultancies for

institutions to determine their IT requirements and then development or supply of the necessary solutions, web design, and hosting.

The types software on the market were mainly application software such as Microsoft, accounts, pay roll, MIS, most of these are imported and modified or sold in parts according to clientele needs and available capital.

#### 6.4.1.1.5 Telecommunications Sector

- In 1994 a private company celtel to provide mobile cellular services and in 1998 MTN was licensed as a SNO and
- In 2000 51% of UTL shares were sold to an international consortium for US\$33.5 million by telecel international that has 80% shares and deteconm with 20% shares.

(g) Services offered by the different telecommunications companies include:

(i). *Uganda Telecom Limited*

ISDN –high-speed landlines that can be used for transmission of voice data and images over a single telephone line offer Internet access. The rates are shown in Table 20.

**Table 66: Rates of Internet Access**

Tariff	Shillings
Fixed charges	
Connection fee	170000
Subscription fee	10000 per month
National long distance	200
Europe/south Africa	
N. America/Australia	1500 per minute
S&C America	2000
Asia	2000
Middle east	2000
Rest of Africa	2300

#### (a). Telecel Mobile Division

The Telecel mobile phone tariffs are indicated in Table 67.

**Table 67: Telecel (Mango) Mobile Phone Tariffs**

Tariff	Peak	Economy	Super economy
To UTL	340	280	185
UTL national	340	280	180
UTL Mobile	340	280	180
Mtn fixed	420	360	360
Mtn national	420	360	360
Mtn mobile	420	360	360
To celtel	430	360	360
East Africa	1000	1000	1000
Europe/south Africa	2000	2000	1300
N.America/aust	2000	2000	1300
S&C America	2700	2700	2100
Asia	2700	2700	2100
Middle east	2700	2700	2100
Rest of Africa	3500	3500	3500

## (ii). Celtel

- GSM communications
- Data and fax services GSM conference phone facilities
- Communicators sell (GSM phone to PC)
- Develop accounts systems
- Sell phones, sim cards, communicators, and premicells
- Celtel imports and assembles ICT products
- Agents all over the country however these invest 90% of their capital
- Celtel is mainly involved in setting up infrastructure

## IT Rates

Internet email data celtel combined with Infocom together offer 200 dial in lines including ISDN, Microwave and GSM connectivity 2048KB band width the ISP has 3 earth stations metro net (high-speed wireless connection to the Internet web page design and hoisting celtel allows to link mobile to fax or pc the service is at normal airtime rates currently celtel covers 29 districts in Uganda east, west, central and west Nile

**Table 68: Celtel Mobile Phone Tariffs**

	Permanent connection fee exclusive of vat	Cash and talk fee Inclusive of vat	Community phone
Connection fee	43750	49000	N/A
Monthly access fee	38500	N/A	N/A
Daily access fee	N/A	613	N/A
All calls (peak	315	438	500
Calls to other networks (off peak	245	333	500
Calls to Celtel only discount time	123	175	500
SMS	175	175	N/A
East Africa	1575	1225	1700
Europe and South Africa	2100	2100	2500
N. America & Australia	2100	2100	2500
South & central America	2100	2503	2500
Middle east	2100	2503	2500
Asia	2100	2503	2500
Rest of Africa	2100	2503	2500

**(a). Services provided by MTN**

Fixed line services include:

- I. ISDN service,
- II. WLL,
- III. MTN Euroset,
- IV. Fixed phone,
- V. Basic telephony,
- VI. Leased lines and Internet band width,

WLL MTN has remarked for next year Wireless loop is a CDMA digital point to multi-point system that will be deployed on the existing GSM. This is also an option to areas where fibre optic line is not available for delivery of services.

**(b). MTN Euro set**

Leased lines are dedicated between two points that transmit voice, fax and data. It is suitable for businesses or corporate with numerous branches distributed around the country or wishing to connect office internationally.

- Leased line capacity is 64KB; on fibre optic there is no limit on amount of data or bandwidth.
- The wall has a 128Kblimit.
- The cost of the leased line depends on capacity and distance connection fee is 2000000

- Internet bandwidth provides a business with high speed and dedicated access to the Internet with no need to dial up via an ISP

Fibre optic line that start in most parts pf Kampala CBD and industrial areas.

It will provide all the telecommunications and broad band data demands these include voice and digital will be delivered at a minimum of 64kb, high speed dial up data services at a min of 64kb for internet and e-mail, leased lines services available form 64kb upwards Internet bandwidth access for exclusive access to www.

All pay as you go cards available in 140 outlets throughout Uganda. MTN is available in 18 districts and 53 towns in Uganda all shell petrol stations, Simba telecom, and other MTN franchise owners

The growth of the telecommunication industry has led to the emergency of numerous related businesses namely phone repair shops, phone vendors and their accessories, pirated phones second hand phone shops.

### **Internet Market.**

Other business formations in the information economy were in the area of the Internet market. There is free entry in this market and 2% of the revenue collected is contributed to the national development fund.

This is a rapidly growing sector Internet service providers have grown from just 2 in 1996 to 11 in 2001. Eight of which have VSAT and International Data Gateways.

The bandwidth that is currently offered has considerably increased from 640kb to 1.3 MB. This has increased competition and improved services in this sector however despite the competition the price is still relatively high.

The price is an average of US\$50 per on the of unlimited access in addition to this users have to pay local telephone charges which increase the access considerably. For example for one hour a day, the telephone charge would amount to US\$93 makes the overall access charge go up to US\$143 per month.

The number of Internet subscribers has also increased from a mere 504 in 1996 to 5999 in 2001.

The other type of economic activity that is rapidly gaining ground are the Internet cafes, have also considerably grown from just 1 in 1996 to 47 in 2001as indicated Table 69 below:

**Table 69: The Internet Cafes in Uganda**

Year	1996	1998	1999	2000	2001
Number of cafes	1	10	30	42	47

The growth of internet cafes in Uganda or precisely in Kampala led to increased competition in this area has pushed the prices considerably down from UGshs300 per minute in 1996 to an average of UGshs 50 shillings per minutes in internet cafes. Growth and competition in this sector has led to improvement of services, most of the cafes have increased the number of PCs, to cater for the growing demand of in Internet users, higher access speed and some have ventured out of the city center to the suburbs. Most Internet cafes have increased the types of services offered some have started computer applications training to complement their services. The other growing type of business in web page design and hosting.

#### **6.4.1.1.6 Professional services sector**

There are also some specialized/professional soft wares on the market for example Syscorp software company was in the business to resale ETAP an engineering software and this was already been distributed to UEB. Most of these companies are agents of larger companies in developed nations and thus most of the different hard ware can be supplied if requested for. These companies keep updating them with the changes in the technology. The software is adjusted to meet customer requirements.

Developing local software was not existent except for adjusting, making of data bases to fit an institutions requirements using existing packages like access these have been mainly sold to government institutions.

The average number of employees in the software companies was 4 permanent and can go up to 11 temporary here in case of a project. Most of the companies also offered consultancy to institutions to determine IT requirements repair etc. Among the professional services offered were repair, consultancy.

## **6.5. Strategic Planning**

### **6.5.1. General Description, Indicators and Benchmarks**

Strategic planning is an important means of addressing the need for strengthened ICT sector. Most important, a strategic approach is needed to nurture and promote widespread and effective use of ICT in the country in support of overall national development priorities. As demonstrated by global trends the world has entered the information age, countries must take into account and take appropriate policy decisions concerning their information and communication sub sectors. This entails identification of options and strategies for achieving sustainable ICT sector development.

A national ICT strategy serves as the blue print for ICT sector development that contains a coherent set of aims; objectives, priorities and constraints are clearly defined. In turn, this enhances the achievement of clearly defined milestones for national ICT sector development. There are real institutional and resource transformations in all sectors and any strategy to achieve greater sustainability must be continually updated to address these constant changes. A country level policy and stocktaking exercise could perhaps provide basic background information on issues surrounding the country's core management capacity.

Strategic planning is important for several reasons, among others:

- To provide a coherent framework to help address priority areas and key constraints
- To develop and improve the necessary ICT policies and local capabilities in support of strategic uses
- To address the policy institutional, and infrastructure constraints to effective implementation, use and sustainability of ICT projects
- To help identify those of application with the highest impact on the country's development strategy
- To provide support for national mechanisms to address cross-sectoral issues influencing the use and diffusion of ICT.

#### **Definitions**

Strategic planning as used in this report addresses the creation of an enabling environment that includes measures like:

- I. Policy, legal and regulatory framework towards the development of an environment for financing, provision and delivery of ICT and services.
- II. Strives for the development of human and institutional capability to ensure the efficient and equitable provision of ICTs and services.

## **Indicators**

The study adopted the following indicators to monitor long range planning capability:

### **Institutional indicators**

- a) Creation and strengthening of ICT institutions within the Government and the country
- b) Creation of high-level committees (presidential, cabinet, parliamentary) for ICT decision-making, house committees and subcommittees that examine national focal areas.
- c) Training and capacity building of staff within these institutions.

### **Policy and Legislative Indicators**

- a) Strategy document, cross sectoral analysis; prescriptive policies
- b) Reflection of the periodic five year plans, public investment plans, public investment plans; other significant plans; other significant sectoral master plans such as Internet, optic fiber, rural communications
- c) Enactment of ICT policies, guidelines and legislation
- d) Colloquia conferences and meetings
- e) Other policy related matters

### **Programme Indicators**

- a) Implementation of schedules of programmes such as universal access, rural telecommunication

### **Capacity Building indicators**

- a. Number of local/national staff trained
- b. Capacity within government and community to undertake strategic activities
- c. NGO strengthening activities

## **6.5.1.1. Overview of Strategic Planning**

### **(a). The Role of Government**

In reflecting upon the role of government the need arose to review the management responsibility inherent in the government. Most important, Government has a very important role to articulate its vision, although this should be done in concert with the stakeholders.

- Government has a primary role to play in the entire ICT sector, including executive oversight and programme control
- Creating an enabling environment through;
- Policy creation

- Programme implementation
- Long-range planning including creation of a workable infrastructure

#### **(b). Policy and Legal Framework**

Uganda's communication sector structure is supported and enabled through legislation passed in 1997 through the Uganda Communications Act. In the existing structure:

- The ministry of Works, Housing and Communications provides oversight and policy guidance to the ICT sector
- The Communications Department oversees the Uganda Communications Commission (regulator)
- The Uganda Communications Commission (UCC) implements Government's communication policy through licensing, regulation and standardization

#### **6.5.1.2. Telecommunications Sector**

The fundamental goals underpinning the Government's telecommunications policy is set out in the Minister's policy statement in issued annually. The main thrust of January 1996 ministerial policy statement<sup>24</sup> was to:

- Increase the geographical coverage of services throughout the country- the target set by the minister's statement is to increase telephone density from 0.28 lines per 100 persons to 2 lines per 100 persons.<sup>25</sup>
- Service unmet demand for telecommunications service estimated by the ITU as being approximately 184, 000 lines by 1997 and set to grow to 380,000 by 2006;
- Ensure a balanced and well-coordinated network through appropriate licensing, regulation and standardization;
- Improve the quality of telephone services
- Develop competition across a broad spectrum of telecommunication services including e-mail, paging, voicing, low cost data transmission and cable distribution of images; and
- Provide basic services in the country for urgent communication in times of emergency

The Reform Strategy in the policy sought to achieve the following:

- Facilitate private sector participation in the communication sector as well as in the overall national development
- Provide a legal framework for the development of communications services in Uganda;

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<sup>24</sup> The ministerial policy statement provides the basis and focus of the current ICT plan, as well as the background to current reforms in the ICT sector.

<sup>25</sup> The ministerial policy Statement for the year 2002/2003 set a new target of 3 lines per 100 persons.

- Separate the roles of policy formulation, regulation and operations
- Introduce competition through licensing multiple operators

#### 6.5.1.3. Investment Strategies

**(a). The “Big Push Strategy”** - recognizes that ICT is too important a sector of the economy to be left to run on its own without well set out policy and implementation project to ensure that all ICT investment by the Government and private sector is well focused to drive Uganda to become a major center of excellence for information and communication technology in the region.

Key areas of investment outlined by the strategy include:

- Setting up ICT zones
- Setting up infrastructure in telecommunication
- Investment in ICT human resources development
- Investment in provision of ICT-enabled services
- Setting up joint venture companies for software development and software exports
- Investment in gender participation in ICT
- Investment in local assembly of ICT equipment
- Investment in ICT telecentres and Internet cafes
- Investment in ICT training facilities
- Investment in setting up film production centers and web site development

#### 6.5.1.4. Universal Access

The communications Act along side the operator network roll out obligations embedded in the operating licenses provide a basis for universal access. Efforts to enhance universal access include;

- Regional network roll out obligations for lines and payphones by regions have been set for two national operators
- Under the Communications Act operators are required, directly through the license roll out obligations to attend to rural communications development

#### 6.5.1.5. Rural Communications

- Rural Communications Policy developed
- Rural Communications Development Fund (RCDF) established
- RCDF Manual developed
- Tenders advertised
- RCDF funding secured from IDA

#### **6.5.1.6 Competition**

The Communications Act prescribes a licensing regime

- Competition is ensured through the existing licensing regime. Licensing rules give guidelines on pricing which influences affordability.
- Licensing rules determine the market power control and competition in the communications market

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## 6.6. Capacity Development

### 6.6.1. General descriptions, Indicators and Benchmarks

#### (a). Introduction

In the 1970s and 1980s, the use of computers by several organizations and individuals in Uganda was a myth. Very few organizations like Uganda Commercial Bank, Uganda Electricity Board, Uganda Posts and Telecommunications Corporation, and the Uganda Printing and Publishing Company had computers. In many cases, these were not the conventional standalone computers, but main frames with a common processor and a number of terminals.

The capacity to use IT equipments was limited, and a few who had it were trained from abroad mainly by the same organizations that carried out the supply of and installation of the equipment. Later, in the 1980s came developments and many organizations started using computers (8086 processors). The 1990s saw further developments in the PC industry, earlier with 286 processors, followed by 386, 486, and now the Pentiums. Software has also had similar developments, i.e. IBM, DOS, MS-DOS, Windows 3.1, Windows 95, 98, 2000 and now Windows XP. The development and use of the Internet can be traced to around mid 1990s and now Internet based applications and cafes have become a major employer of the Ugandan IT professionals, especially after the liberalization of the communications sector in 1996.

Lack of access to ICTs is but one of the challenges that face many Ugandans. However, in Uganda there are increased initiatives both by government and the private sector to computerize most of their operations. In consequence, the use of ICTs has increased, and is continuing to increase. The potential to cope with new developments already exists. These developments have created a need for an enhanced ICT skills base and aroused a need for corresponding capacity development programs. This has translated to the increasing number of privately owned IT training institutions and the establishment of courses in universities and other training establishments, and the incorporation of IT education in secondary and primary schools. In addition, IT associations have emerged to embrace the new developments in the ICT sector. The issues need to be assessed from a developing country perspective.

#### (b). Indicators

ICT capacity development has both human and institutional dimensions. Key indicators used to track both aspects of capacity development in the ICT sector include:

- The range of ICT Professions
- The supply and Demand of ICT Skills
- The number and kinds of ICT Training Institutions
- Remuneration of ICT Professional

- The number and kinds of ICT Professional Associations that emerge

#### **6.6.1.1. Overview of Capacity Development**

Beginning with the early 1990s, there was increasing appreciation and adoption of ICT in Uganda, specifically the use of computers. As noted earlier, computers were initially used in government organizations or departments largely because of the large investments that were required. As costs started lowering the private sector as well individuals in homes appropriating personal computers. The use of telephony also necessitates skills development. Several telecommunications related courses mainly the Uganda Communications Institute (UCI) has conducted.

ICT has already been incorporated in the academic programmes of several primary and secondary schools, especially those in and around Kampala. The Ministry of Education and Sports has revised the Primary Education Programme to include ICT as a subject that will be examinable, commencing 2002.

The increased demand for ICT skills has led to the mushrooming institutions that offer training in the use of mainly computers. Prior to this, most ICT professional had to be trained from abroad especially for advanced degree programs. The range of ICT skills provision in Uganda falls under the following categorizations:

- Degree courses at universities
- Diploma courses at universities and other tertiary training institutions
- Certificate courses
- Seminars and workshops

Despite some initial efforts more works is still needed in terms of capacity development. In particular, the use of ICT to facilitate access to information and its appropriation requires development of an appropriate skills base and processes at the level of the individual and the organization, and within sectors over the country.

#### **Drawbacks**

Notwithstanding the benefits, there are certainly some draw backs to capacity development or perhaps should be seen as hurdles to capacity development. These include socio-economic status and cultural background. Some of the problems relate to:

- The benefits of the information society are still prospective for most Ugandans. The digital divide is quite real.
- Non availability of ICT training institutions in some areas of the country
- Lack of access to basic training materials and other critical resources in local languages is but one of the challenges that face most Ugandans.
- ICT related courses are still tom expensive for most to afford

### **6.6.1.2. Supply and Demand of ICT Skills**

In this study, ICT professionals is used to refer to individuals who have obtained at least a diploma in computer science or one who has taken data processing as an option at a tertiary institution.

(a). Supply side: this refers to the number of IT professionals produced in the various training institutions. The following ICT related courses are offered in various institutions in Uganda in some of these courses ICT is an essential option:

- As a general observation, all universities have integrated ICTs in the programmes they offer.
- Bachelor, diploma and certificate in Library and Information science graduates are produced from Makerere University each year
- Bachelors of Computer Science graduates are produced from several universities each year.
- Bachelor of Statistics are produced from Makerere University
- Post Graduate diploma in Computer Science
- Diploma courses
- Bachelor of engineering
- Bachelor of Business Administration
- Master of business Administration
- CISCO training Programmes

Remuneration of ICT professionals is not quite attractive in most organizations and many well- trained individuals would rather offer their skills to better remunerating countries. Thus, it is quite difficult for organizations to retain professionals for long.

As a general observation, it is quite evident that there are more ICT professional (supply) than what the local market can accommodate. The job opportunities for IT professional are very limited.

(b). Demand side:

- Competition, resulting from liberalization, has led to increased use and adoption of ICT in the economy. This has increased the demand for ICT skilled manpower of all sorts ranging from software engineers, technicians, data entry clerks, system analysts, engineers, programmers etc.
- It is quite evident from newspaper adverts that 90% of them require that applicants must be computer literate with specific expertise in given packages or applications.
- Besides, in house courses are conducted to impart ICT skills to serving employees. Thus, creating a demand for ICT skills.

### **6.6.1.3. ICT Institutional Capacity Development**

Several institutions have emerged and are likely to bring about positive results:

- Uganda Computer Society

- Uganda Internet Society
- Uganda Communications Commission
- Uganda Journalists Association
- Uganda Media Association

Institutional development is still minimal and activity mainly concentrated around the urban areas where there is presence of ICTs. There need for NGOs and the private sector to put more effort to institutional development.

#### **Categories of ICT Institutions Offering ICT Related Courses**

- 12 Universities
- Other Higher Learning Training Institutions
- Primary (in and around Kampala) and Secondary Schools
- Private

#### **6.6.1. 4 Present ICT Capacity Development Projects**

<b>Project</b>	<b>Description</b>	<b>Status</b>
Strengthening Community Based Organizations Through ICTs in Uganda	Aims at the improvement of organizational, managerial, and functional capacities of community based organizations in Uganda	Ongoing

#### **6.6.1.5 Sources of Knowledge**

In this study there were no definitive sources of knowledge identified. The study provides the initial focused source of knowledge.

#### **Conclusion**

The issues need to be addressed from a developing country perspective. As with other sectors, Uganda does not appear to do well on all indicators on capacity development a lot is yet to be done in terms of policy in put to stimulate ICT capacity development in the country. Some critical and interrelated areas that need to be strengthened include:

- Strengthening the skills base, visions, strategies for Ugandans to become actively engaged in ICT applications
- Identify challenges faced individuals, organizations, communities in improving access to IT education and training.

Broader conditions are needed to confront both challenges and opportunity of capacity development.

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