NATIONAL INFORMATION TECHNOLOGY AUTHORITY

2016

STATISTICAL ABSTRACT

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National Information Technology Authority-Uganda (NITA-U)
P.O. Box 33151,
Kampala (U)
Email: info@nita.go.ug
Website: www.nita.go.ug

FOREWORD

The National Information Technology Authority-Uganda (NITA-U) is committed to the production and dissemination of integrated Information Technology (IT) statistical information that meet the international standards quality requirements. This is the first edition of the Annual Statistical Abstract produced by NITA-U.

The NITA-U Statistical Abstract covers statistics on the Information Technology status in government, state of internet and telephony services, ICT sector performance in the economy, Trade in ICT goods, Information and communication sector business, Information Technology usage in business, Information Technology access and usage for households and individuals, Information Technology in higher education Institutions and Uganda's ICT rankings on the global scale. Information on these categories is presented on either a Calendar Year (January-December) or Financial Year (July-June) basis, depending on availability of data. The abstract also provides statistics collected within the Authority during the course of normal operations and in conducting its duty as a Government agency in charge of coordination, promotion and monitoring of Information Technology developments in Uganda. Other statistics are collected from other agencies that are involved in the production of Information Technology statistics.

The NITA-U Statistical Abstract therefore, is one of the Authority's efforts aimed at enhancing data dissemination and use. Copies of this publication are available on the NITA-U website: www.nita.go.ug. We sincerely hope that this publication will greatly benefit its users.

It is my sincere hope that the statistical information in this publication will be used by the readers to make informed decisions.

James Saaka
Executive Director

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LIST OF ACRONMYS

COBE	Census of Business Establishments
FY	Financial Year
HS	Harmonized System
ICT	Information and communications Technology
IDI	ICT Development Index
IT	Information Technology
ITU	International Telecommunications Union
LAN	Local Area Network
LDCs	Least Developed Countries
MAN	Metropolitan Area Network
MDAs	Ministries, Departments and Agencies
NBI	National Backbone Infrastructure
NCHE	National Council for Higher Education
NITA-U	National Information Technology Authority-Uganda
NRI	Networked Readiness Index
R&I	Research and Innovation
SITC	Standard International Trade Classification
UBOS	Uganda Bureau of Statistics
UCC	Uganda Communications Commission
UN	United Nations
URSB	Uganda Registration Services Bureau

EXECUTIVE SUMMARY

This NITA-U Statistical Abstract is an annual publication of some key statistics produced within the Authority under its mandate to coordinate, promote and monitor Information Technology developments. Other statistics are collected from agencies that are involved in the production of Information Technology statistics. The statistics in this publication therefore represent the final product of data collected through surveys, regular reporting forms and data collected in the course of carrying out the Authority's roles (administrative data).

This publication is divided into nine major thematic areas which include; the Information Technology status in government, state of internet and telephony services, ICT sector performance in the economy, Trade in ICT goods, Information and communication sector business, Information Technology usage in business, Information Technology access and usage for households and individuals, Information Technology in higher education Institutions and Uganda's ICT rankings on the global scale.

Information Technology status in government

The Information Technology status in government presents statistics on the state of Information Technology in government Ministries, Departments and Agencies (MDAs) in terms of; Information Technology workforce, Information Technology budget, Computer usage, Internet usage and access, availability of Information Technology infrastructure for continued implementation and re-engineering of government programmes; state of websites and information security in government MDAs with the following highlights:

- In February 2016, Information Technology employees made up 2.7 percent of the workforce in the government MDAs, a slight increase of 1.1 percent from 2012
- 1.4 percent of the total MDAs budget for FY2015/16 was for Information Technology
- 44.9 percent of government MDA employees routinely use computers for work purposes in 2016 down from 50.5 percent in 2012

- The proportion of government MDA employees who were routinely using the Internet at work stood at 43.4 percent in February 2016 compared to 39.7 percent in 2012
- In February 2016, several government MDAs had more than one way of connecting to the internet
- 91.8 percent of government MDAs were connected to the Internet via Fixed (wired) broadband
- All the 75 government MDAs that responded to the survey in February 2016 had a web presence
- 98.6 percent of government MDAs had LANs
- 57.5 percent of government MDAs had intranets
- Three quarters of the websites for MDAs had up-to-date news
- 88.9 percent of the government MDA websites had minimum static information in 2015
- 49.1 percent of the 57 government MDA websites had their dynamic data such as news articles not dated in 2015
- 96.8 percent of government MDAs websites had several accessibility errors essentially to web browsers and specialized groups of people
- 77.8 percent of the government MDA websites were integrated with social media for promotion in 2015
- Less than half of Government organisations had an Information Security policy in place to mitigate the risks related to Information Security in February 2016
- Also 51 percent of the governments MDAs had Information Security Responsibility assigned to someone.
- In addition, 55.3 percent of the assigned staff were at Officer level, 42 percent at Managerial level and only 2.6 percent at Director level
- 54.5 percent of the government MDAs in February 2016 had perimeter based security gadgets
- In February 2016, 81.8 percent of the Government MDAs reported that they had mechanisms for dealing with threats on the inside of their networks

Internet and telephony services

Internet and telephony services section includes statistics on connectivity to the National Backbone Infrastructure; total bandwidth; Internet subscriptions and use; Fixed Internet bandwidth pricing; and Fixed, Mobile phone and Total Subscriptions and Teledensity. Below are highlights of the section:

- In FY 2015/16, 74 additional MDA sites were connected to the NBI increasing the total number of MDA sites connected to the NBI to 133
- Of the total number of connected MDA sites, 94 MDA sites were utilizing internet delivered over the NBI
- The total bandwidth grew to 41695.27Mbps in FY2015/16, resulting into a 27 percent growth in bandwidth per 1million inhabitants
- A growth of 30.6 percent in the number of mobile internet subscriptions to 7.9 million in FY2015/16
- There was a 13.4 percent growth in fixed internet subscriptions to 139,000 in FY2015/16
- The estimated total internet subscriptions increased by 30.2 percent from about 6.2 million in FY2014/15 to about 8.1 million in FY2015/16
- The estimated total internet users increased by 19.6 percent to 15.5million FY2015/16 resulting into an internet penetration of 44.8 percent
- In 2015, the average market price for 1Mbps reduced significantly by US$263 to US$267 from US$530 in 2014
- In FY 2015/16, a total of 22,034,891 active mobile phone subscriptions were recorded, an increase of 0.6 percent compared to the 14percent growth in FY 2014/15
- A total of 340,851 active fixed phone subscriptions were recognised in the FY 2015/16
- The total telephone phone subscriptions resulted into a 4.2 percent decline in tele-density, from 63.9 percent in 2014/15 to 62.1 percent in FY 2015/16

ICT sector performance in the economy

The ICT performance in the economy section includes statistics on Value Added to Gross Domestic Product (GDP) by ICT Sector, contribution of ICT sector activities to national GDP, companies registered to carryout ICT related services, status of investment in the ICT sector. Below are highlights of the section:

- The value of ICT sector activities to GDP at market prices grew by 47 percent in FY 2015/16 which translates to UGX shillings 7.7 billion
- In FY 2015/16, around 95 percent of value added of the ICT sector in 2015/16 was generated by activities of Telecommunications
- The contribution of ICT sector activities to national GDP at current prices accounted for 8.7 percent in FY 2015/16 compared to 6.6 percent in FY 2014/15
- The number of new companies registered to carryout ICT related services reduced from 638 in FY2014/15 to 580 in FY2015/16
- Over the last 9 years, the total number of new licensed companies to carry out ICT related projects/services has on average decreased. In 2015, only 2 companies were licensed compared to 6 companies in 2014
- In 2015, total funds planned to be invested in firms or enterprises to run ICT related projects/services was USD$1 Million compared to USD$5Million in 2014
- The year 2015 recorded only 97 planned jobs in ICT related businesses while in 2014, 654 planned jobs were recorded

Trade in ICT goods

The Trade in ICT goods section includes statistics on formal ICT goods export earnings; formal ICT goods import bill and Tax Revenues in the ICT sector. The highlights are:

- During the FY 2015/16, total formal ICT goods export earnings were estimated at US$ 11.1 million
- The overall ICT export goods earnings declined by 64 percent in 2015/16 compared to the previous financial year
- The decline in total ICT goods export earnings was partly attributed to a 77 percent decline in the Telecommunications and sound-recording and reproducing apparatus and equipment category

- The total formal ICT goods imports bill in 2015/16 stood at US$ 208.5 million
- The total ICT goods imports expenditure declined by 14 percent in 2015/16 after another drop of 14 percent in 2014/15
- There was a decline of 29 percent in Office machines and automatic data-processing machines imports expenditure from US$ 63.5 million in 2014/15 to US$ 45.4 million in 2015/16
- Tax revenues in the ICT sector increased by 7.2 percent from UGX 802.3 billion to UGX 864.5 billion in 2014/15
- ICT sector domestic tax revenues grew by 10 percent from UGX 684.6 billion in FY 2013/14 to UGX 758.5 billion in FY 2014/15
- ICT sector customer tax revenues dropped from UGX 117.7billion in FY 2013/14 to UGX 105 billion in FY 2014/15

Information and communication sector business statistics

- The 2010/11 Census of Business Establishments results showed that nearly 4,200 businesses were registered in the Information and Communication sector
- A total of about 14,400 persons were engaged in the Information and Communication sector accounting for 1.3 percent of the total Census of Business Establishments employment
- On average, 4 persons were employed per business in the Information and Communication sector
- Majority (90 percent) of businesses in the Information and Communication sector were employing less than 5 persons
- Distribution of the businesses by annual turnover showed that the highest proportion were those with an annual turnover of less than 5 million shillings, accounting for 66 percent
- About 86 percent of the businesses in the Information and Communication Sector were owned as Sole Proprietorships

- The results from the 2010/11 Census of Business Establishments showed that only 27 percent of the total registered businesses in the Information and Communication sector owned and used computers
- The 2010/11 Census of Business Establishments findings also showed that 58 percent of the businesses were less than 5 years of age

Information Technology usage in business

This section assesses the use of Information Technology in businesses mainly through computers and internet. In the 2010/11 Census of Business Establishments, information was collected on the status of ownership of computers and internet use by businesses in the following aspects:

- Information obtained from the 2010/11 Census of Business Establishments, shows that overall, only 5 percent of the businesses owned computers
- Computer usage was highest (79 percent) in the Construction businesses sector followed by those in Utilities with 64 Percent
- Out of those businesses without computers, the businesses in the Fishing, services, trade and Agriculture sector dominated
- Only 3 percent of the businesses used internet for business operations
- Further analysis indicated most of the establishments that used internet services in their business were in the construction sector

Information Technology access and usage for households and individuals

This section presents a summary of the access and use of computers, the internet and mobile phones in Uganda households. The highlights are summarized below:

- The proportion of households with a working television set increased marginally by 9 percent from about 5 percent recorded in 2002 to 14 percent in 2014
- In 2014, about 40 percent of the households in urban areas indicated that they had a working television set compared to only 6 percent of the households in rural areas
- The proportion of households owning a working radio increased from 49 percent reported in 2002 to about 60 percent in 2014

- Radio ownership among households remained relatively higher in urban areas than in rural areas constituting 64 percent in urban areas and 58 percent in rural areas in 2014
- The proportion of households with functional telephones lines increased from about 1 percent in 2002 to only 5 percent in 2014
- According to national population and housing census results for 2014, 69 percent of the households in the country owned mobile phones
- About 38 percent of people aged above 10 years in Uganda were active users of mobile phones in 2014
- The proportion of active users of mobile phones was relatively higher in among males than females corresponding to 45 percent of the male people aged above 10 years compared to about 33 percent of the female people aged above 10 years
- Internet as a main source of information slightly improved from about 1 percent in 2002 to 7 percent in 2014
- In 2014, only 3.8 percent of individuals owned a computer
- Only 6.5 percent of the individuals had used the internet in 2014
- About 77 percent of all internet users indicated to be members of at least one social media network in 2014

Information Technology in higher education Institutions

- In academic year 2013/14, there was a 7 percent increase in total computer units in institutions of higher learning from 14,941 in academic year 2012/13 to 15,913
- The number of computers connected to Internet more than doubled (9,254) that reported in 2012/13, which, was at only 4,210

Uganda's ICT rankings on the global scale

- The UN e-Government Survey 2016 Report reflects that Uganda greatly improved by 28 positions in its global e-government development index from rank 156 globally to rank 128

- The 2016 E-Government status for Uganda is estimated at 36 percent compared to the World's average of 49.2 percent
- In 2016, globally, Uganda dropped its ranking in the overall NRI from the 116th position out of 143 countries in 2015 to the 121th position out of 139 countries
- According to the International Telecommunication Union, Uganda declined from the rank of 146 out of 166 countries in 2013 to 149 out of 167 countries in 2015

GLOSSARY

Bandwidth:

Bandwidth is used as a synonym for data transfer rate, the amount of data that can be carried from one point to another in a given time period (usually per second). This is expressed in bits (of data) per second (bps). Occasionally, it is expressed as bytes per second (Bps). A modem that works at 57,600 bps has twice the bandwidth of a modem that works at 28,800 bps.

Broadband:

Broadband refers to technologies that provide access to the Internet at download speeds of 256 kbit/s or greater. It includes both fixed broadband technologies and wireless broadband technologies.

Computer:

This means an electronic, magnetic, optical, electrochemical or other data processing device or a group of such interconnected or related devices, performing logical, arithmetic or storage functions; and includes any data storage facility or communications facility directly related to or operating in conjunction with such a device or group of such interconnected or related devices; (Electronic Transactions Act, 2011).

For statistical purposes, this will include “a desktop computer, a laptop computer or a tablet or similar handheld computer. It does not include equipment with some embedded computing abilities, such as devices with telephony as a main function, such as mobile or smartphones.”

Domestic Internet bandwidth:

This refers to the used capacity for exchanging national Internet traffic. Out of the total national bandwidth available in the country (i.e. the potential capacity of the connections), there is a part that corresponds to the contracted or purchased capacity. This contracted capacity refers to bandwidth put into service, but not all of which is used; some is held in reserve for restoration or redundancy. This indicator thus refers to

the portion of the contracted capacity that is actually used to carry traffic. It refers to the capacity Internet Service Providers use to connect to Internet exchanges.

Electronic Government (e-Government):

This is the use of information and communication technologies to deliver public services in a convenient, efficient customer-oriented and cost-effective way.

Fixed broadband:

This comprises of technologies that provide access to the Internet at download speeds of 256 kbit/s or greater over fixed wired technologies (DSL, Cable modem, FTTH/FTTB, Other fixed wired) and fixed wireless technologies (Satellite and terrestrial).

ICT goods:

ICT goods are those that are either intended to fulfil the function of information processing and communication by electronic means, including transmission and display, or which use electronic processing to detect, measure and/or record physical phenomena, or to control a physical process.

ICT Sector:

The ICT sector combines manufacturing and services industries whose products primarily fulfil or enable the function of information processing and communication by electronic means, including transmission and display. This comprises ICT manufacturing industries, ICT trade industries and ICT services industries.

ICT services:

ICT services are those intended to enable the function of information processing and communication by electronic means.

International Internet bandwidth:

This is the used capacity of international connections between countries for transmitting Internet traffic. Out of the total international bandwidth available in the country (i.e. the potential capacity of the connections), there is a part that corresponds to the contracted or purchased capacity. This contracted capacity refers to bandwidth put into service, but

not all of which is used; some is held in reserve for restoration or redundancy. This indicator thus refers to the portion of the contracted capacity that is actually used to carry traffic. If the bandwidth is asymmetric, the incoming (downlink) capacity should be provided.

Information Technology:

This means the science of collecting and using information by means of computer systems and refers to computers, ancillary or peripheral equipment such as printers and scanners, software and firmware services including support services, and related resources and includes any equipment or interconnected systems that are used in the acquisition, storage, manipulation or processing, management, movement, control, display, transmission or reception of data or information.

Information Security:

This means the protection of information and information systems from unauthorised access, use, disclosure, disruption, modification or destruction (National Information Technology Authority, Uganda.

Internet:

This is worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer − it may also be by mobile phone, PDA, game machine, digital TV or other device). Internet access can be via a fixed or wireless network.

Intranet:

This refers to an internal communications network using Internet protocols and allowing communication within an organization (and to other authorized persons). It is typically set up behind a firewall to control access.

Local Area Network (LAN):

This refers to a network connecting computers within a localized area such as a single building, department or site; it may be wireless.

Metropolitan area network (MAN):

A metropolitan area network is similar to a local area network (LAN) but spans an entire city or campus. MANs are formed by connecting multiple LANs. Thus, MANs are larger than LANs but smaller than wide area networks (WAN). MANs are used to build networks with high data connection speeds for cities and towns.

The working mechanism of a MAN is similar to an Internet Service Provider (ISP), but a MAN is not owned by a single organization. Like a WAN, a MAN provides shared network connections to its users. A MAN mostly works on the data link layer, which is Layer 2 of the Open Systems Interconnection (OSI) model.

Mobile broadband:

These are technologies that provide wireless high-speed Internet access at download speeds of 256 kbit/s or greater through mobile devices such mobile phones, laptops, tablets and other mobile Internet devices using portable modems (USB modem /dongle, a data card or built-in device (on some laptops), or a mobile Wi-Fi (or MiFi)). Mobile broadband is available with most 2G, 2.5G, 3G and higher speed mobile technologies.

Mobile broadband-Standard:

These are mobile subscriptions which provide access to the larger Internet with advertised data speeds of 256 kbit/s or greater, which have been used to make an Internet data connection over Internet Protocol in the previous three months. Standard mobile subscriptions are typical voice subscriptions which also provide access to the Internet but are not purchased separately. Subscriptions which only offer “walled garden” or email-only services (or SMS/MMS only) as well as those offering access to the open Internet but that only have made access to "walled garden" and email-only services in the last three months will not be considered. Bundled offers (i.e., voice and data access) for a unique (flat rate) tariff are to be counted if a data connection has been made in last 3 months.

Mobile broadband-Dedicated:

These are dedicated data services over a mobile network which are purchased separately from voice services either as a standalone service (modem/dongle), i.e. excluding mobile handset users or as an add-on data package to voice services which requires an additional subscription. All dedicated mobile data subscriptions with recurring subscription fees are included as “active data subscriptions” regardless of actual use. Pre-paid mobile broadband plans (i.e. all non- recurrent fee subscriptions) require active use in previous 3 months. Subscriptions which only offer “walled garden” or email-only services (or SMS/MMS only) will not be considered. Bundled offers (i.e., voice and data access) are excluded.

Routinely:

At least once every week.

Website:

This means a location on the internet and a collection of web pages, images, videos, data which are addressed relative to a common Uniform Resource Location (National Information Technology Authority, Uganda (E-Government) Regulations, 2015).

Wide area network (WAN):

This is a network that exists over a large-scale geographical area. A WAN connects different smaller networks, including local area networks (LAN) and metro area networks (MAN). This ensures that computers and users in one location can communicate with computers and users in other locations. WAN implementation can be done either with the help of the public transmission system or a private network.

Wireless broadband:

This comprises of technologies that provide access to the Internet at download speeds of 256 kbit/s or greater over wireless technologies. These include; fixed wireless technologies (satellite broadband and terrestrial) and active mobile-broadband connections to the public Internet.

World Wide Web (WWW):

This is a specific category of internet interface that uses hyperlinks and multimedia documents. The www is a system of Internet servers that supports a collection of documents that are written and formatted using the same type of programming language, called Hypertext Markup Language, or HTML.

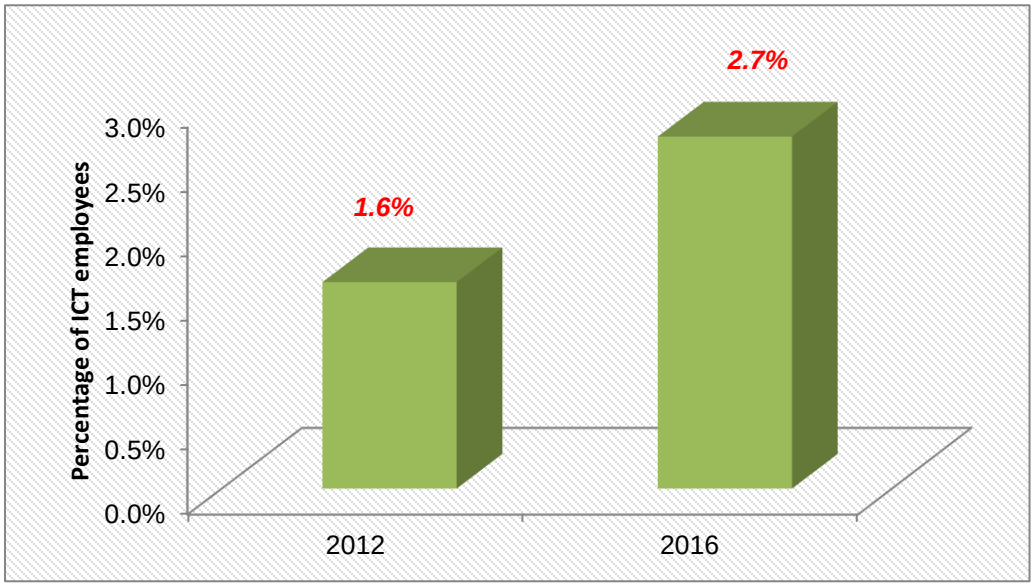
1. INFORMATION TECHNOLOGY STATUS IN GOVERNMENT MDAs

This section includes the state of Information Technology in government Ministries, Departments and Agencies (MDAs) in terms of; workforce, budget, Computer usage, Internet usage and access, availability of Information Technology infrastructure for continued implementation and re-engineering of government programmes; state of websites and information security in in government MDAs. Statistics in this section are based on the Government IT Heads Survey that was conducted in MDAs in 2012 and 2016.

1.1 Information Technology workforce in Government MDAs

In February 2016, Information Technology employees made up 2.7 percent of the workforce in the government MDAs, a slight increase of 1.1 percent from 2012 (figure 1.1). Government Agencies had 3.8 percent of Information Technology staff; Government Ministries had 1.9 percent while Departments had 1.4 percent.

Figure 1.1: Distribution of Information Technology employees in Government MDAs; 2012-2016



Source: Estimated based on the Government IT Heads Survey data

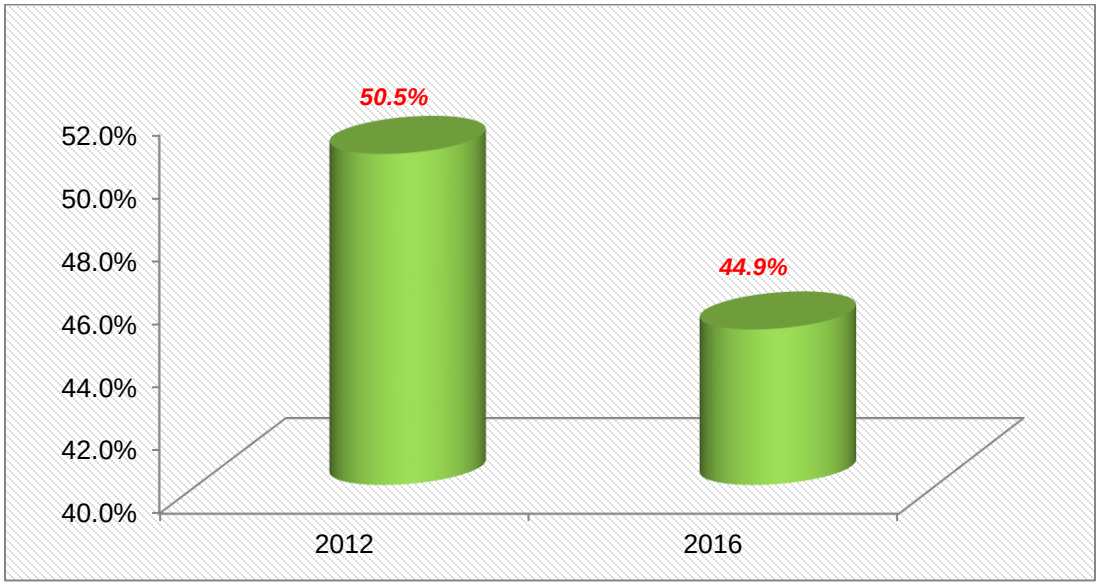
1.2 Information Technology Budget in Government MDAs

The proportion of Information Technology budget for FY 2015/16 for the 42 government MDAs that provided information on total organisation budget and total Information Technology budget during the Government IT Heads Survey conducted in February 2016 is estimated at 1.4 percent.

1.3 Computer usage in Government MDAs

According to the 2016 Government IT Heads Survey, 44.9 percent of government MDA employees were routinely using computers for work purposes, down from 50.5 percent in 2012 (figure 1.3). Employee computer usage was estimated to be 64.1 percent in Government Agencies; 52.4 percent in Ministries and 14.6 percent in Departments.

Figure 1.3: Distribution of persons employed in government MDAs routinely using computers; 2012-2016



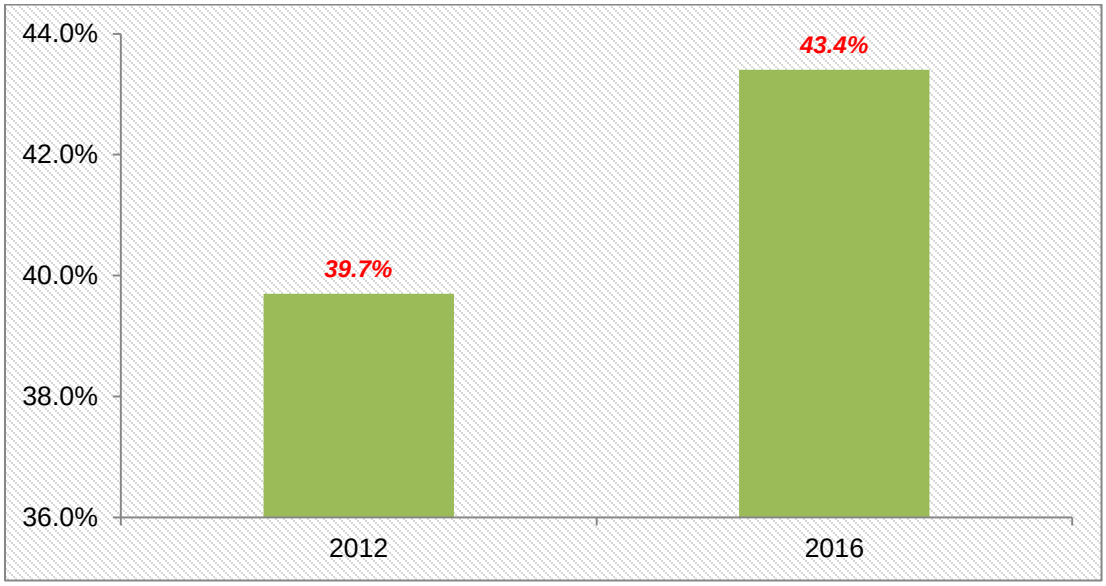
Source: Estimated based on the Government IT Heads Survey data

1.4 Internet usage in Government MDAs

The proportion of government MDA employees who were routinely using the Internet at work stood at 43.4 percent in 2016 compared to 39.7 percent in 2012 (figure 1.4).

Employee internet usage stood at 63.7 percent in Government Agencies; 44.0 percent in Ministries and 13.6 percent in Departments.

Figure 1.4: Distribution of persons employed in government MDAs routinely using Internet; 2012-2016

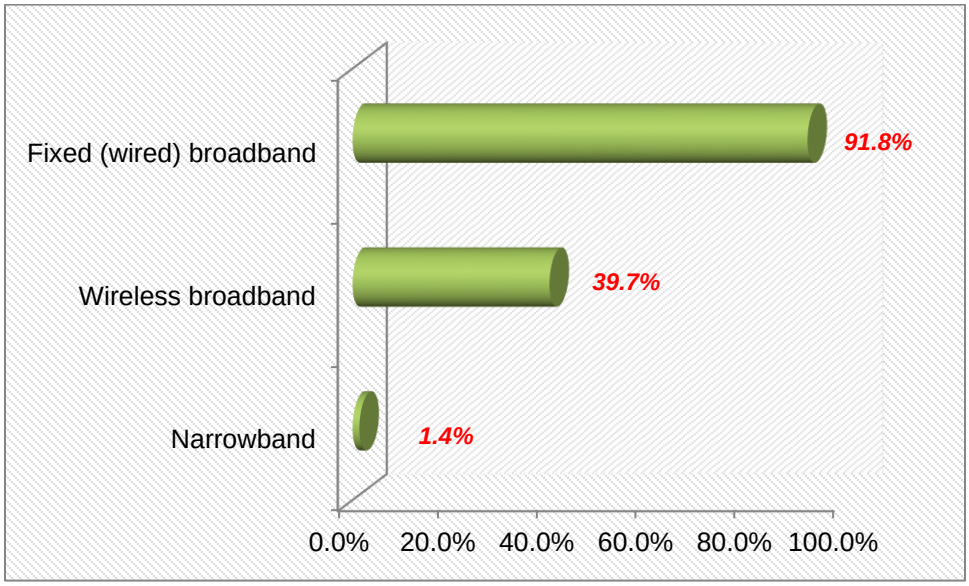


Source: Estimated based on the Government IT Heads Survey data

1.5 Type of Internet access in Government MDAs

According to the Government IT Heads Survey conducted in February 2016, several government MDAs had more than one way of connecting to the internet; however, the majority of organisations; 91.8 percent were connected via Fixed (wired) broadband, 39.7 percent of organisations were connected via Wireless Broadband while 1.4 percent were connected via narrowband (figure 1.5).

Figure 1.5: Distribution of government MDAs with access to the Internet by type of access; 2016

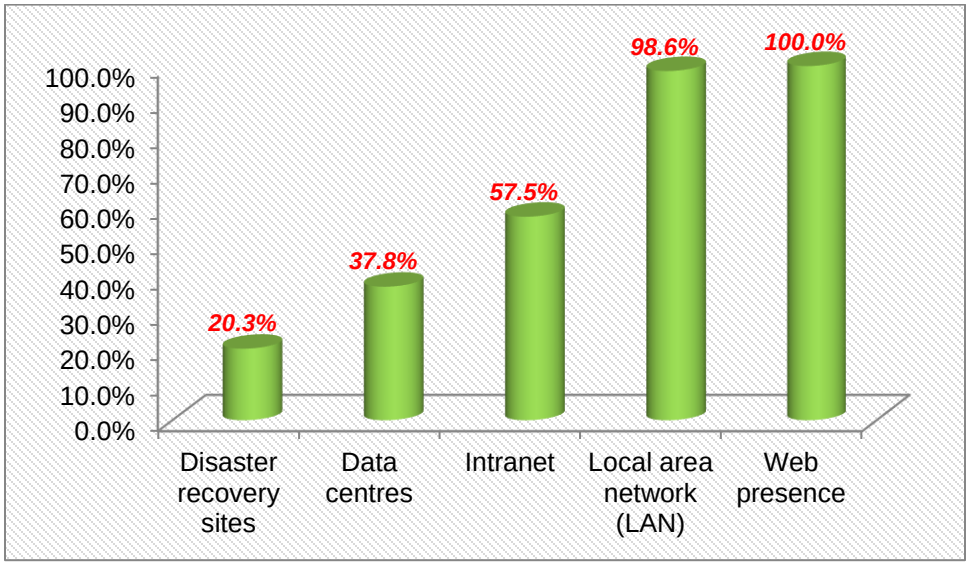


Source: Estimated based on the Government IT Heads Survey data

1.6 Information Technology infrastructure in Government MDAs

All the 75 government MDAs that responded to the survey in February 2016 had a web presence comprising of a website, homepage or presence on another entity's website, social media pages and accounts (for example, Facebook, YouTube and Twitter). On the other hand, 98.6 percent of government MDAs had LANs and only 57.5 percent had intranets. On the contrary, the percentage of government organisations with Data centres and Disaster recovery sites was low (37.8 percent and 20.3 percent respectively) (figure 1.6).

Figure 1.6: Distribution of government MDAs by possession of Infrastructure; 2016



Source: Estimated based on the Government IT Heads Survey data

1.7 State of websites in Government MDAs

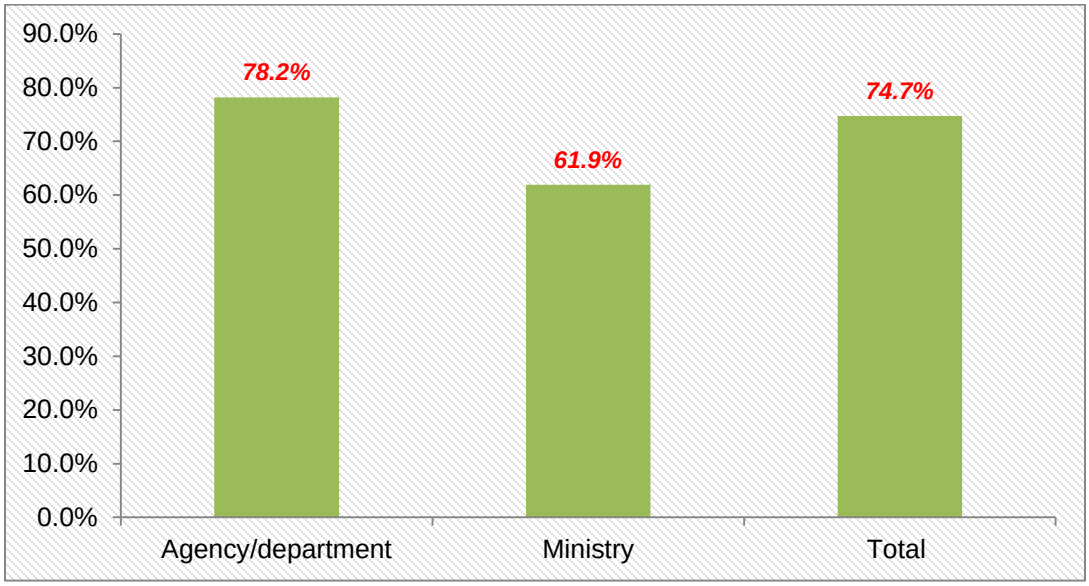
In December 2015, an online assessment of 99 websites for government MDAs was conducted. The assessment considered several aspects including;

1. Dynamic data which comprised of news, announcements, notices, speeches and events made in the last one year.
2. Minimum static information included the name of the organisation, logo, mandate, projects and services, leadership and contacts among others.
3. Design misfits incorporated branding such as symbols and colours.
4. Accessibility concerns addressed areas like accessibility to electronic devices, web browsers and specialized groups of people.
5. Social media integration to assess the level of promotion and engagements.

1.7.1 Dynamic news

Three quarters of the websites for MDAs had up-to-date news and only 25 percent had outdated news (figure1.7.1). Government Agency/department websites had more up-to-date news (78.2 percent) compared to government Ministry websites (61.9 percent).

Figure 1.7.1: Distribution of dynamic data (news section) on websites by type of government organisation; 2015

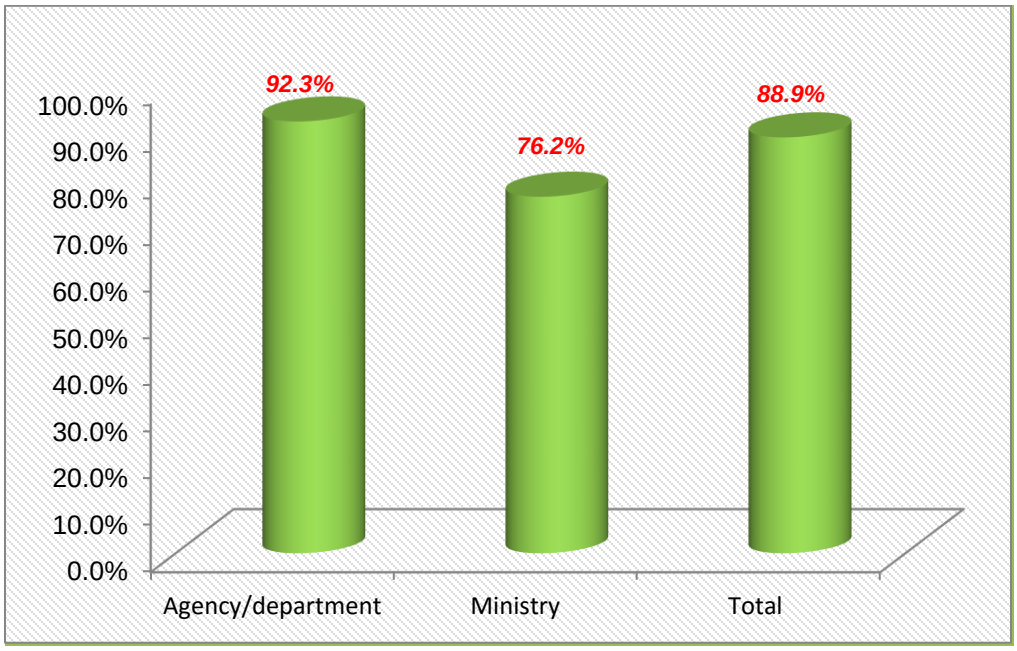


Source: Estimated based on Websites online assessment data

1.7.2 Minimum static information

Findings based on the December 2015 websites online assessment indicate that, 88.9 percent of the government MDA websites had minimum static information including; name of the organisation, logo, mandate, projects and services, leadership and contacts among others. Government Agency/department websites were better in minimum static information (92.3 percent) compared to government Ministry websites (76.2 percent) (figure 1.7.2).

Figure 1.7.2: Distribution of minimum static information on MDA websites; 2015

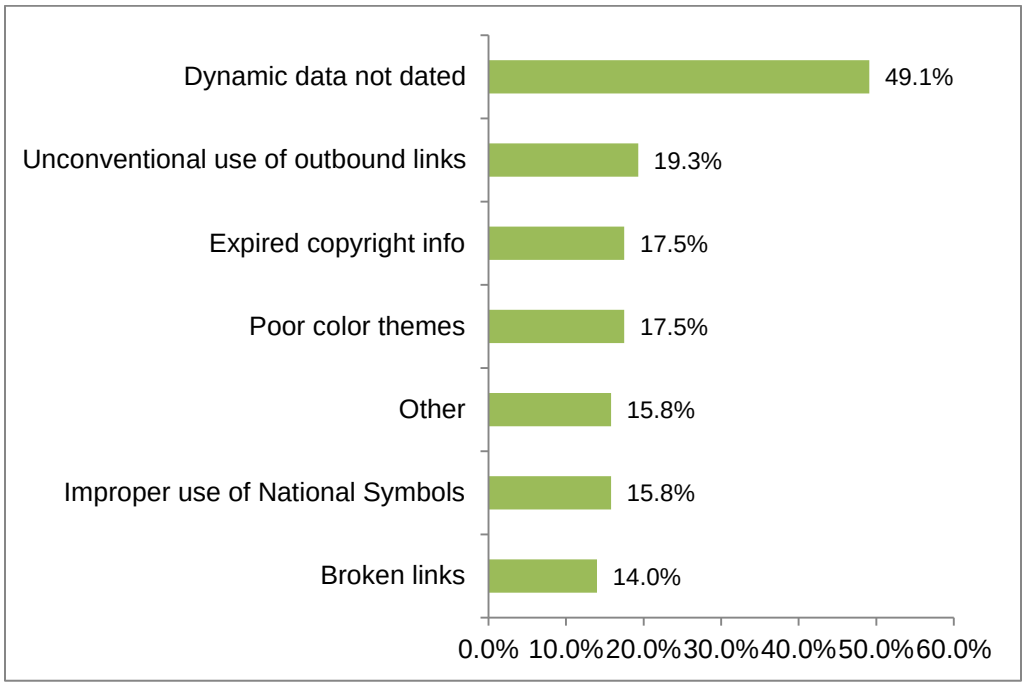


Source: Estimated based on Websites online assessment data

1.7.3 Design misfits

According to the findings of the December 2015 Websites online assessment, 49.1 percent of the 57 government MDA websites had their dynamic data such as news articles not dated. Unconventional use of outbound links was also noticed (19.3 percent), expired copyright info 17.3 percent) and poor theme colors (17.3 percent) among other design misfits as shown in the figure 1.7.3 below.

Figure 1.7.3: Distribution of Design misfits on websites; 2015

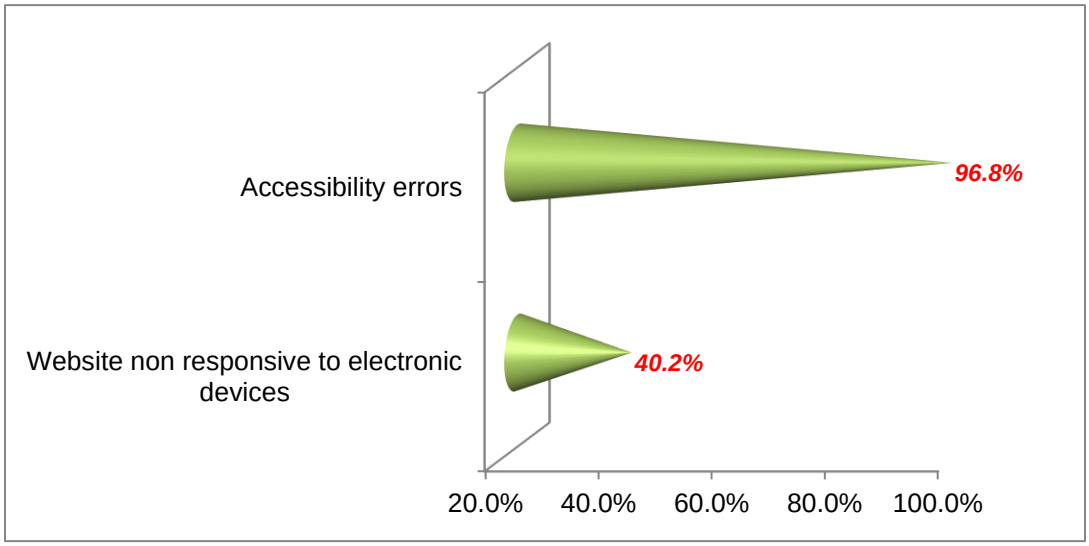


Source: Estimated based on Websites online assessment data

1.7.4 Accessibility concerns

In December 2015, 96.8 percent of government MDAs websites had several accessibility errors essentially to web browsers and specialized groups of people. It is also observed that 40.2 percent of the websites were non responsive to some or all electronic devices (figure 1.7.4).

Figure 1.7.4: Distribution of MDA website accessibility concerns; 2015

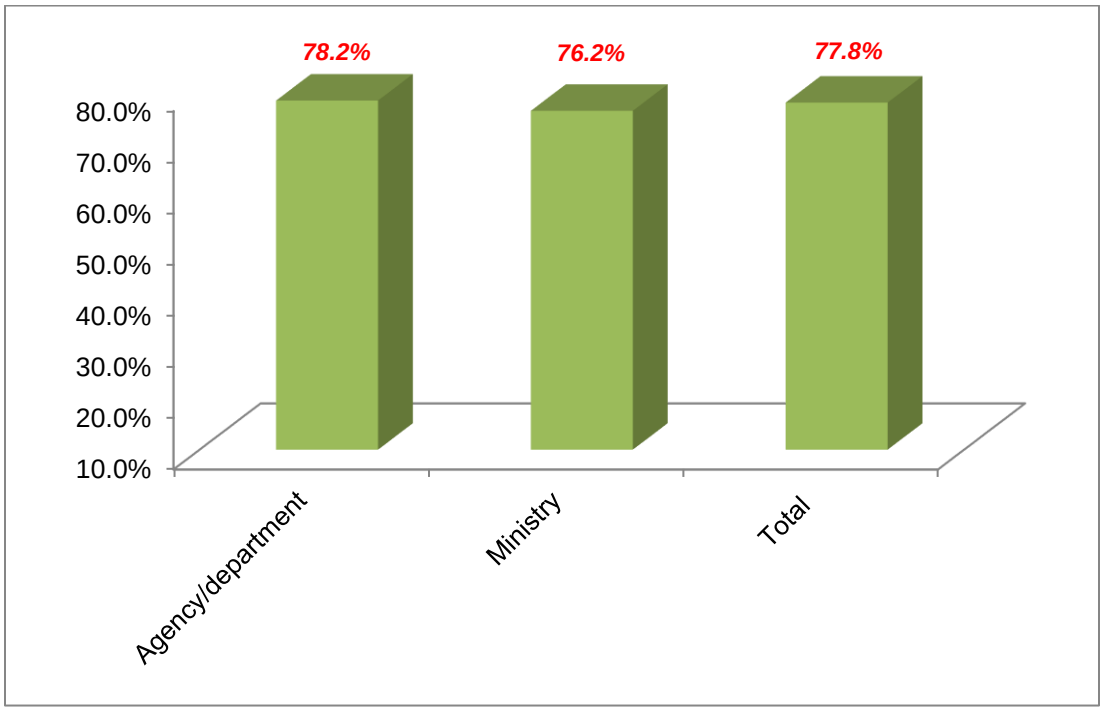


Source: Estimated based on Websites online assessment data

1.7.5 Social media integration

It is also observed that 77.8 percent of the government MDA websites were integrated with social media for promotion. There was no significant difference in the integration of websites with social media between Ministries and Agencies/departments. Among the government organisation websites that were integrated to social media; the average Facebook likes were 7,308, a maximum of 121,907 likes and a minimum of zero likes. Average Twitter-followers were 41,105; a maximum of 652,000 followers and a minimum of zero followers (figure 1.7.5).

Figure 1.7.5: Distribution of MDA websites integration to social media; 2015



Source: Estimated based on Websites online assessment data

1.8 Information Security in Government Organisations

This section covers aspects of Information in terms of policy, staffing and environment in government Ministries, Departments and Agencies based on the findings from the Government IT Heads Survey conducted in February 2016.

1.8.1 Information Security policy

Based on the findings from the Government IT Heads Survey conducted in 75 government Ministries, Departments and Agencies in February 2016, less than half of Government organisations had an Information Security policy in place to mitigate the risks related to Information Security. Within government Agencies, 52.8 percent have

Information Security policies compared to 27.3 percent and 26.8 percent within Government Ministries and Departments respectively (table 1.8).

1.8.2 Information Security staffing

Fifty one (51) percent of the governments MDAs had Information Security Responsibility assigned to someone. Within government ministries, 56.4 percent had staff assigned to handle Information Security roles, within government agencies, 56.4 percent and among Government Departments 50 percent.

Among the 38 government MDAs that had Information Security responsibility assigned to someone, 55.3 percent of the assigned staff were at Officer level, 42 percent at Managerial level and only 2.6 percent at Director level (table 1.8).

It can also be noted that among the 30 government MDAs that responded to the issue of supervisory level for the assigned information security staff, 86.7 percent of the supervisors are top managers and the remaining 13.3 percent were midlevel managers.

Furthermore, among the 14 staff in all government MDAs who had received training in Information Security, 57 percent had it in management aspects (Certifications in Risk, GIAC, CISSP and CISM); 14 percent in Security Audit aspects (CISA, CRISC, MCITP, BCS Certified Information Security Audit) and 29 percent in Technical aspects (Security+, IDS Management, Basic Training in CEH, Cybersec) (see table 1.8.1 below).

Table 1.8.1: Status of Information Security policy and staffing; 2016

Category	Ministry	Department	Agency	Total
Information Security policy	**N=11**	**N=7**	**N=53**	**N=71**
Yes	27.3%	28.6%	52.8%	46.5%
No	72.7%	71.4%	47.2%	53.5%
Total	100%	100%	100%	100%
Information Security responsibility assigned	**N=11**	**N=8**	**N=55**	**N=74**
Yes	56.4%	50.0%	56.4%	51.4%
No	43.6%	50.0%	43.6%	48.6%
Total	100%	100%	100%	100%
Information Security responsibility position	**N=3**	**N=4**	**N=31**	**N=38**
Director	0.0%	0.0%	3.2%	2.6%
Manager	66.7%	25.0%	41.9%	42.1%
Officer	33.3%	75.0%	54.8%	55.3%
Total	100%	100%	100%	100%
Information Security responsibility Supervisor Level	**N=2**	**N=3**	**N=25**	**N=30**
Mid-level	*50.0%*	*0.0%*	*12.0%*	*13.3%*
Top management	*50.0%*	*100.0%*	*88.0%*	*86.7%*
Total	*100%*	*100%*	*100%*	*100%*
Information Security Training acquired	**N=1**	**N=1**	**N=12**	**N=14**
Management	*0.0%*	*0.0%*	*66.7%*	*57.1%*
Security Audit	*0.0%*	*100.0%*	*8.3%*	*14.3%*
Technical	*100.0%*	*0.0%*	*25.0%*	*28.6%*
Total	*100%*	*100%*	*100%*	*100%*

Source: Estimated based on the Government IT Heads Survey data

1.8.3 Information Security environment

More than half of the government MDAs (54.5 percent) that responded to the Government IT Heads Survey conducted in February 2016 had perimeter based security gadgets. Among the Government Agencies, 78.6 percent had perimeter based security gadgets and within Government Departments 75 percent. On the other hand, only 54.5 percent of Government Ministries had perimeter based security gadgets.

It is also observed that 81.8 percent of the Government MDAs reported that they had mechanisms for dealing with threats on the inside of their networks. Further analysis shows that all the Government MDAs which responded to the survey had endpoint protection software like anti-virus and anti-malware among others. Half of the MDAs had their endpoint protection software deployed as client server, 40.5 percent as standalone while 9.5 percent had both client server and standalone deployments. The survey findings similarly indicate that only 50.7 percent of the Government MDAs were performing active monitoring of their environments.

Furthermore, the survey results show that 64.5 percent of the security incidents among the 35 government MDAs that reported took place in 2015. This was reported more among government departments compared to Ministries and Agencies. In addition, over 40 percent of the security incidents were mainly website attacks (table 1.8.2).

Table 1.8.2: Status of Information Security environment; 2016

Category	Ministry	Department	Agency	Total
Perimeter based security gadgets	**N=11**	**N=8**	**N=56**	**N=75**
Yes	54.5%	75.0%	78.6%	54.5%
No	45.5%	25.0%	21.4%	45.5%
Total	100%	100%	100%	100%
Mechanism for dealing with threats on the inside of the network	**N=11**	**N=8**	**N=56**	**N=75**
Yes	81.8%	87.5%	89.3%	81.8%
No	18.2%	12.5%	10.7%	18.2%
Total	100%	100%	100%	100%
Endpoint protection software	**N=11**	**N=8**	**N=55**	**N=74**
Yes	100%	100%	100%	100%
No	0%	0%	0%	0%
Total	100%	100%	100%	100%
Endpoint protection software deployment	**N=11**	**N=8**	**N=55**	**N=74**
Both	0.0%	12.5%	10.9%	9.5%
Client-Server	54.5%	50.0%	49.1%	50.0%
Standalone	45.5%	37.5%	40.0%	40.5%
Total	100%	100%	100%	100%
Active monitoring of the environment	**N=11**	**N=8**	**N=54**	**N=73**
Yes	45.5%	50.0%	50.0%	49.3%
No	54.5%	50.0%	50.0%	50.7%
Total	100%	100%	100%	100%
Last Time for a Security Incident	**N=5**	**N=5**	**N=21**	**N=31**
2010	20.0%	0.0%	0.0%	3.2%
2012	0.0%	0.0%	9.5%	6.5%
2013	0.0%	0.0%	4.8%	3.2%
2014	0.0%	0.0%	9.5%	6.5%
2015	60.0%	80.0%	61.9%	64.5%
2016	20.0%	20.0%	14.3%	16.1%
Total	100%	100%	100%	100%
Nature of Incident	**N=5**	**N=3**	**N=21**	**N=29**
Malware attack	0.0%	0.0%	4.8%	3.4%
Network attack	0.0%	33.3%	23.8%	20.7%
Physical attack	0.0%	0.0%	9.5%	6.9%
Ransomware attack	20.0%	0.0%	9.5%	10.3%
Virus attack	40.0%	0.0%	14.3%	17.2%
Website attack	40.0%	66.7%	38.1%	41.4%
Total	100%	100%	100%	100%

Source: Estimated based on the Government IT Heads Survey data

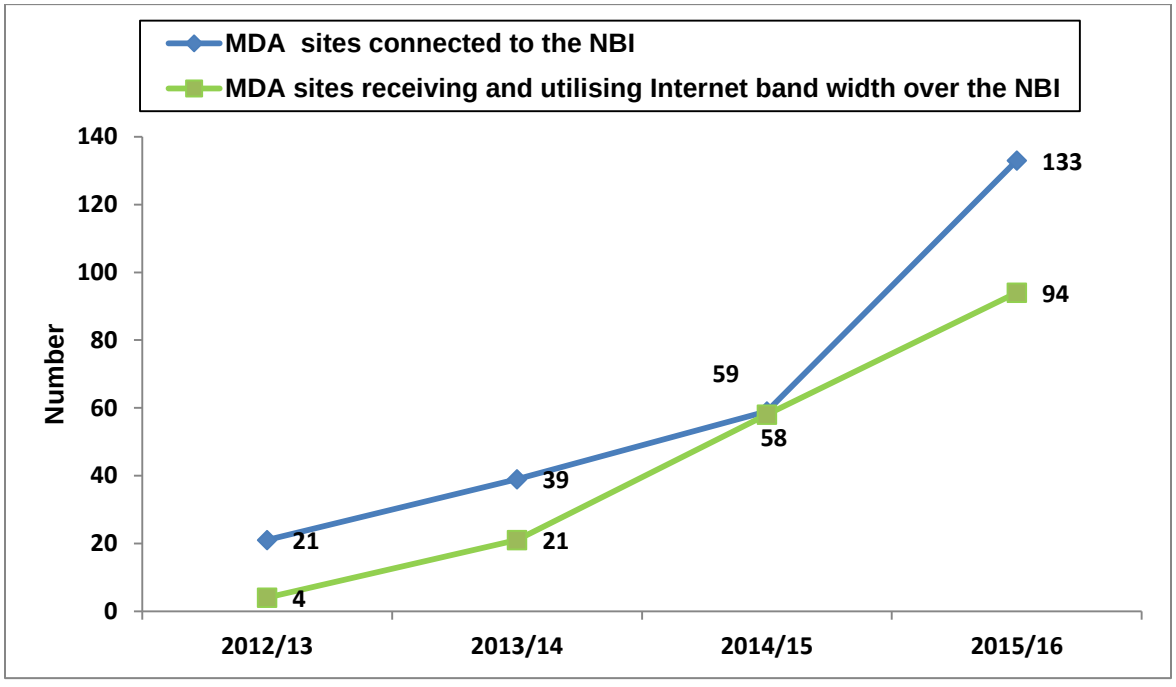
2. INTERNET AND TELEPHONY SERVICES

This section includes statistics on internet and telephony services in Uganda in terms of Connectivity to the National Backbone Infrastructure; total bandwidth; Internet subscriptions and use; Fixed Internet bandwidth pricing; and Fixed, Mobile phone and Total Subscriptions and Teledensity.

2.1 Connectivity to the National Backbone Infrastructure

The National Backbone Infrastructure (NBI) is aimed at connecting all major towns within the country onto an optical fibre based network and to connect all government organisations onto the government network. In FY 2015/16, seventy four (74) additional MDA sites were connected to the NBI increasing the total number of MDA sites connected to the NBI to one hundred thirty three (133) compared to the additional 20 MDA sites connected in FY2014/15. Of the total number of connected MDA sites, ninety four (94) MDA sites were utilizing internet delivered over the NBI (figure 2.1).

Figure 2.1: Number of government MDA sites using the NBI; 2012/13-2015/16

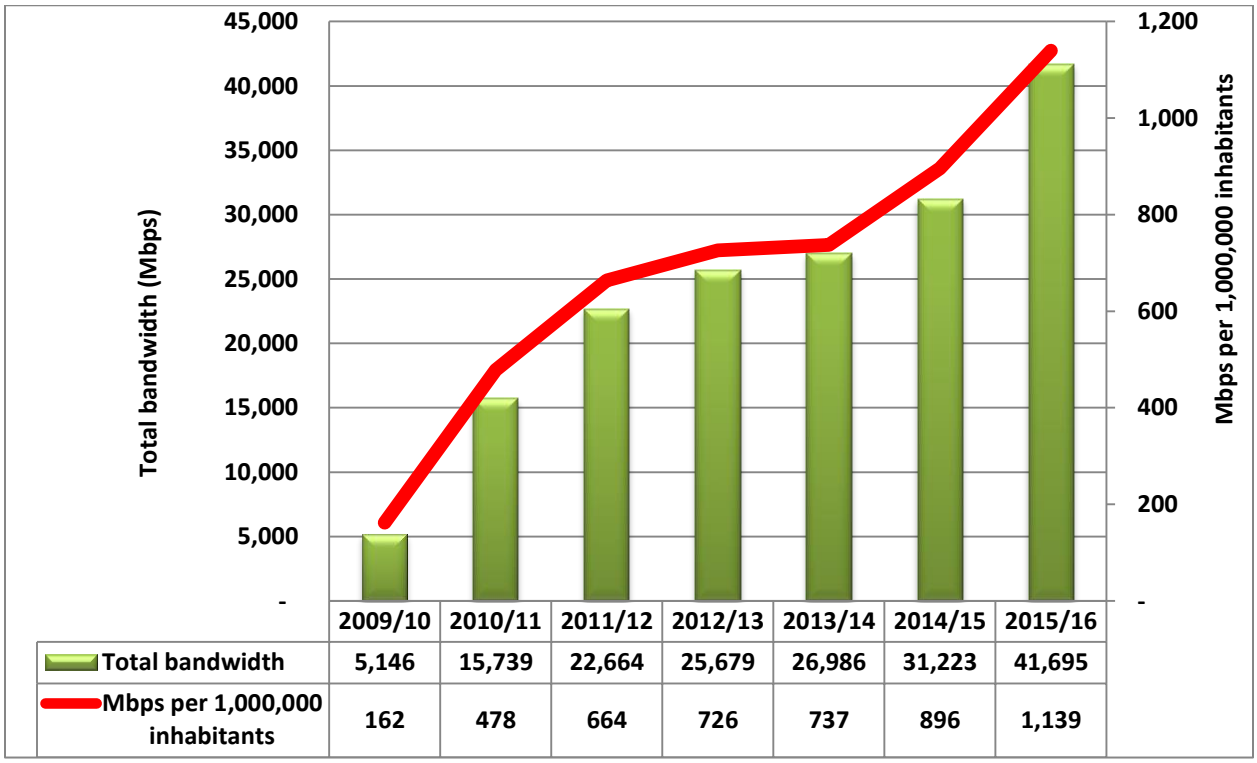


Source: NITA-U administrative reports

2.2 Bandwidth

The total bandwidth grew from 31,222.79Mbps in the previous financial year (2014/15) to 41695.27Mbps in FY2015/16, resulting into a 27 percent growth in bandwidth per 1million inhabitants. This means increased network capacity to carry larger volume of information from one location to the next. This indirectly leads to improved network performance hence higher speed internet services to internet users (figure 2.2).

Figure 2.2: Total bandwidth and bandwidth per million inhabitants; 2009/10-2015/16



	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Total bandwidth	5,146	15,739	22,664	25,679	26,986	31,223	41,695
Mbps per 1,000,000 inhabitants	162	478	664	726	737	896	1,139

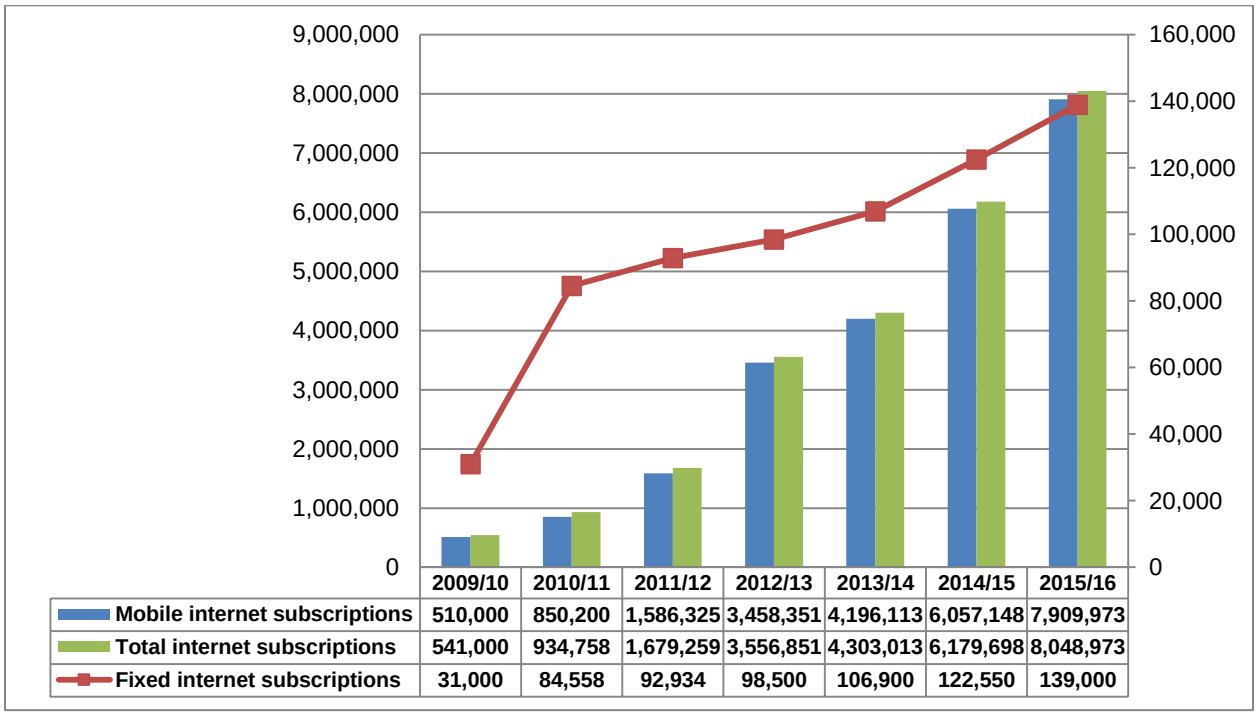
Source: Uganda Communications Commission

2.3 Mobile and Fixed Internet subscriptions

As estimated, there has been an increase in appreciation and usage of Internet which has resulted in a growth of 30.6 percent in the number of mobile internet subscriptions from about 6.1 million in FY2014/15 to 7.9 million in FY2015/16 and a 13.4 percent

growth in fixed internet subscriptions from 122,550 to 139,000 subscriptions in the same period. The estimated total internet subscriptions increased by 30.2 percent from about 6.2 million in FY2014/15 to about 8.1 million in FY2015/16 (figure 2.3).

Figure 2.3: Estimated Internet subscriptions; 2009/10- 2015/16



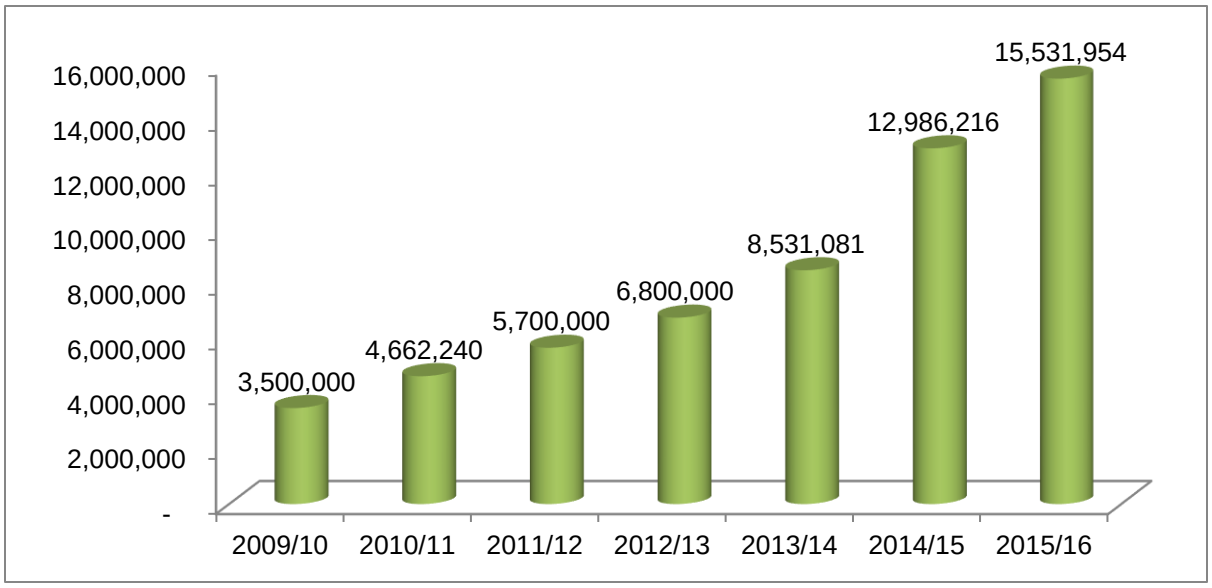
	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Mobile internet subscriptions	510,000	850,200	1,586,325	3,458,351	4,196,113	6,057,148	7,909,973
Total internet subscriptions	541,000	934,758	1,679,259	3,556,851	4,303,013	6,179,698	8,048,973
Fixed internet subscriptions	31,000	84,558	92,934	98,500	106,900	122,550	139,000

Source: Uganda Communications Commission

2.4 Internet users

The estimated total internet users increased by 19.2 percent from about 13million in FY2014/15 to 15.3 million in FY2015/16 resulting into an internet penetration of 44.8 percent (figure 2.4).

Figure 2.4: Estimated internet users; 2009/10- 2015/16

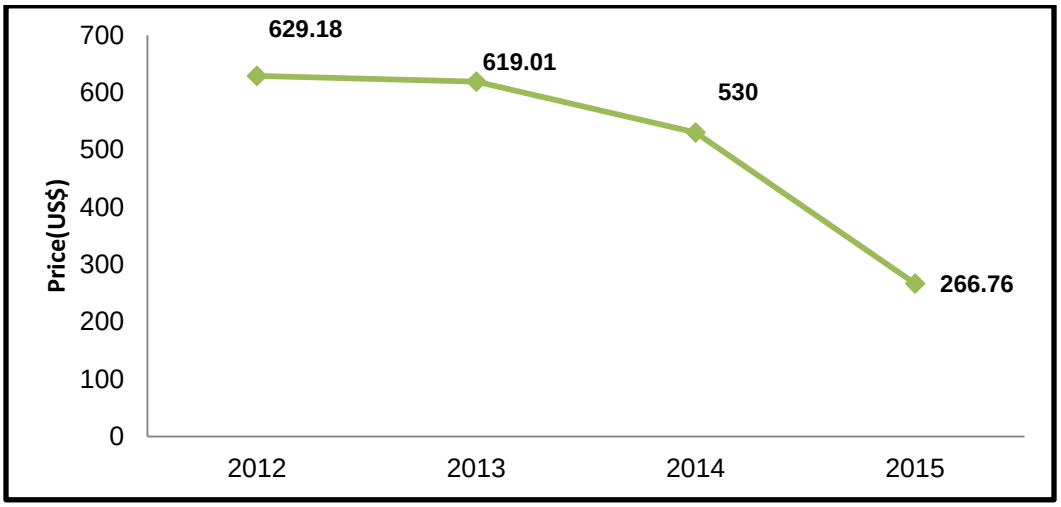


Source: Uganda Communications Commission

2.5 Fixed Internet bandwidth pricing (1Mbps)

The average market price for 1Mbps has been reducing over the past four years. In 2013, the price reduced by US$ 10 from US$ 629 in 2012 to US$619. In 2015, the average market price for 1Mbps reduced significantly by US$263 compared to a reduction of US$ 89 in 2014 (figure 2.5).

Figure 2.5: Market price for 1Mbps; 2012-2015 (US$)



Source: Uganda Communications Commission

2.6 Mobile phone subscriptions

In FY 2015/16, a total of 22,034,891 active mobile phone subscriptions were recorded, an increase of 0.6 percent compared to the 14percent subscription growth in FY 2014/15 and 16 percent registered in the FY 2013/14 (figure 2.8).

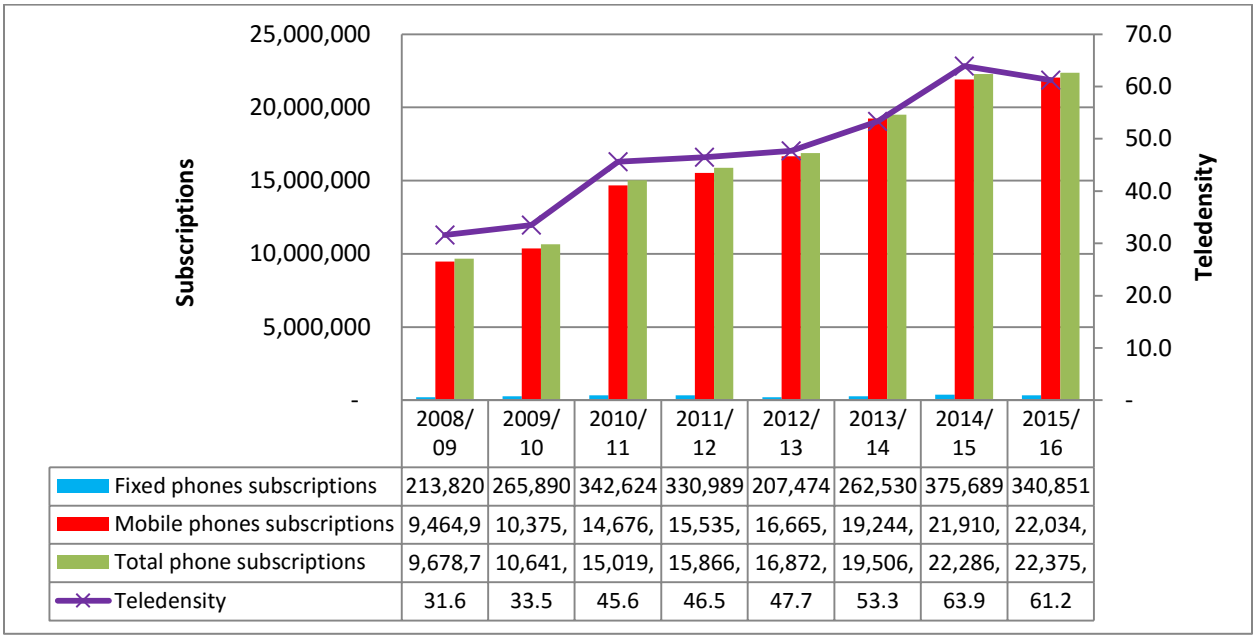
2.7 Fixed phone subscriptions

A total of 340,851 active fixed phone subscriptions were recognised in the FY 2015/16. This is a 6 percent growth and lower than the 43 percent growth in fixed subscriptions registered in the FY 2014/2015 (figure 2.8).

2.8 Teledensity

Telephone density or tele-density is the number of telephone connections for every hundred individuals living within an area (in this case Uganda). The total telephone phone subscriptions resulted into a 4.2 percent decline in tele-density, from 63.9 percent in 2014/15 to 62.1 percent in FY 2015/16. The previous financial however, registered a 10.6 percent growth in tele-density (figure 2.8).

Figure 2.8: Fixed, Mobile phone and Total Subscriptions and Teledensity; 2009/10-2015/16



	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Fixed phones subscriptions	213,820	265,890	342,624	330,989	207,474	262,530	375,689	340,851
Mobile phones subscriptions	9,464,9	10,375,	14,676,	15,535,	16,665,	19,244,	21,910,	22,034,
Total phone subscriptions	9,678,7	10,641,	15,019,	15,866,	16,872,	19,506,	22,286,	22,375,
Teledensity	31.6	33.5	45.6	46.5	47.7	53.3	63.9	61.2

Source: Uganda Communications Commission

3. ICT SECTOR PERFORMANCE IN THE ECONOMY

This section includes statistics on Value Added to Gross Domestic Product (GDP) by ICT Sector, contribution of ICT sector activities to national GDP, companies registered to carryout ICT related services, status of investment in the ICT sector.

3.1 ICT Sector Value Added to Gross Domestic Product (GDP) at Current Price

The ICT sector comprises of ICT-related activities in Manufacturing, Trade and Services industries such as Computer, Electronic and Optical Products; Broadcasting and Programming services; Telecommunications services; Computer Programming, Consultancy and Related services; Information Services; and Repair of Computers.

The value of ICT sector activities grew by 47 percent in 2015/16 compared to a growth of 32 percent realized in 2014/15 which translates to UGX shillings 5.2 billion and 7.7 billion respectively. In FY 2015/16, around 95 percent of value added of the ICT sector

in 2015/16 was generated by activities of Telecommunications, 3 percent by Broadcasting and Programming services and only 2 percent by all the remaining activities (table 3.1).

Table 3.1: ICT Sector GDP at current Prices; 2009/10- 2015/16 (UGX Million)

ICT activities	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Computer, Electronic and Optical Products	505	658	950	679	991	1,042	625
Broadcasting and Programming services	126,874	126,385	151,573	182,537	218,807	204,469	204,196
Telecommunications services	1,971,936	2,144,171	2,106,723	2,276,787	3,618,506	4,863,125	7,273,255
Computer Programming, Consultancy and Related services	60,625	46,663	32,732	48,874	32,099	46,805	38,626
Information Services	20,147	20,953	32,924	36,905	23,400	29,305	73,806
Repair of Computers and Personal and Household Goods service	65,811	63,821	66,657	68,794	71,630	72,256	72,095
ICT sector GDP	2,245,896	2,402,652	2,391,558	2,614,576	3,965,433	5,217,001	7,662,602
Total GDP	**40,941,630**	**47,648,591**	**60,134,039**	**64,464,510**	**70,881,771**	**78,770,241**	**87,965,303**

Source: Uganda Bureau of Statistics

3.2 Share of ICT activities on GDP at current prices

The ICT sector makes a substantial contribution to Uganda's GDP. The contribution of ICT sector activities to national GDP at current prices accounted for 8.7 percent in FY 2015/16 compared to 6.6 percent in FY 2014/15.

The Telecommunications services industries accounted for the highest growth in GDP in FY 2015/16, up 2.1 percent. Information Services increased slightly, up 0.1 percent. The Computer, Electronic and Optical Products manufacturing and Repair of Computers sub-sectors remained the same. Meanwhile, the Broadcasting and Programming services industries GDP decreased slightly, down 0.1 percent (table 3.2).

Table 3.2: Percentage Share of ICT activities on GDP; 2009/10-2015/16

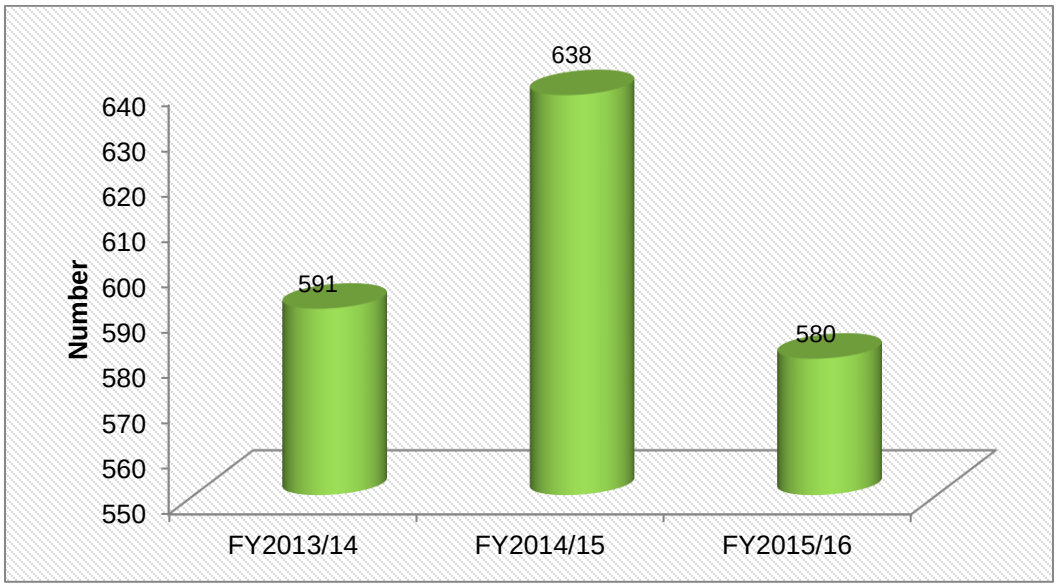
ICT activities	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Computer, Electronic and Optical Products	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broadcasting and Programming services	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%
Telecommunications services	4.8%	4.5%	3.5%	3.5%	5.1%	6.2%	8.3%
Computer Programming, Consultancy and Related services	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%
Information Services	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%
Repair of Computers and Personal and Household Goods service	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
ICT sector	**5.5%**	**5.0%**	**4.0%**	**4.1%**	**5.6%**	**6.6%**	**8.7%**

Source: Uganda Bureau of Statistics

3.3 ICT Companies Registered

The number of new companies registered to carryout ICT related services increased from 591 in FY 2013/14 to 638 in FY 2014/15. There was a reduction of 58 companies (about 9 percent) in the number of new companies registered to carryout ICT related services from 638 in FY2014/15 to 580 in FY2015/16 (figure 3.3).

Figure 3.3: Number of ICT companies registered; 2013/14-2015/16



Source: Uganda Registration Services Bureau

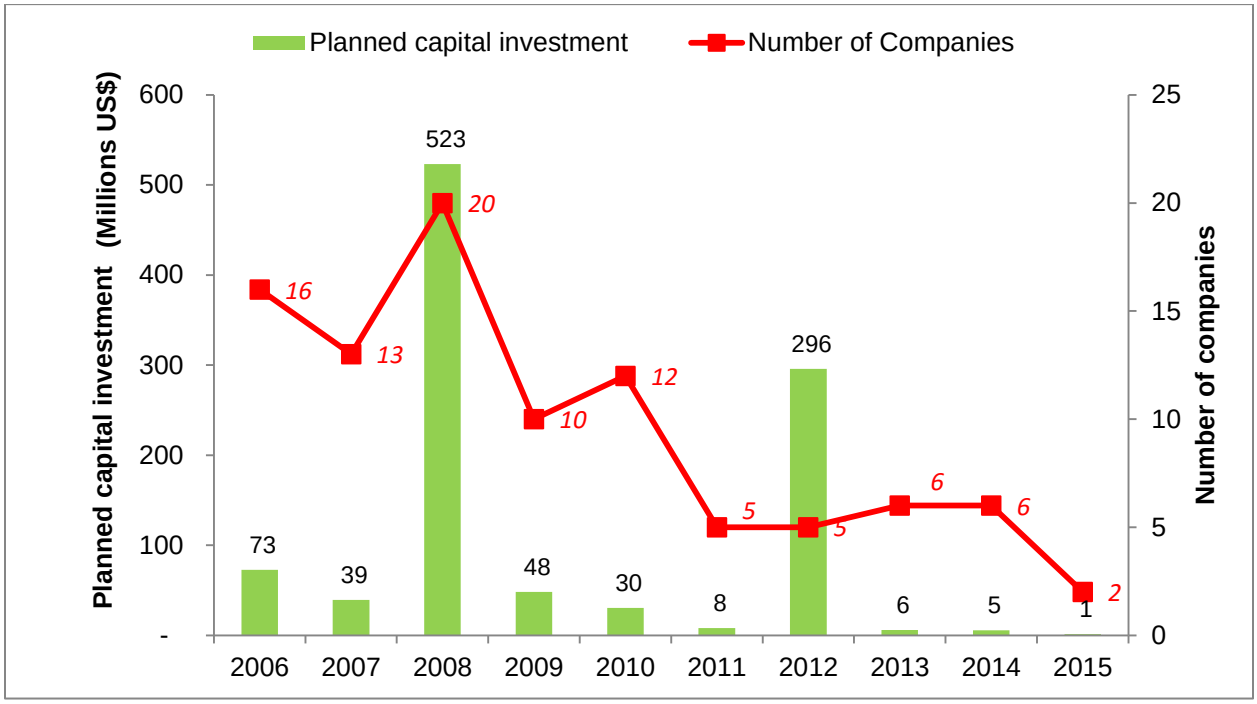
3.4 Number of licensed companies to carry out ICT related projects

Over the last 9 years, the total number of licensed companies to carry out ICT related projects/services has on average decreased. It is important to note however, that the years 2008 and 2010 recorded the highest number of companies that were licensed. The year 2011 and 2015 registered the least number of companies that were licensed (figure 3.5).

3.5 ICT planned capital investment

The total funds planned to be invested in firms or enterprises to run ICT related projects/services have been changing over the last 9 years. The years 2008 and 2012 registered the highest planned capital investment to run ICT related businesses while the year 2014 and 2015 recorded the lowest amount (figure 3.5).

Figure 3.5: Number of licensed companies and ICT planned capital investment (US$ Million); 2006-2015

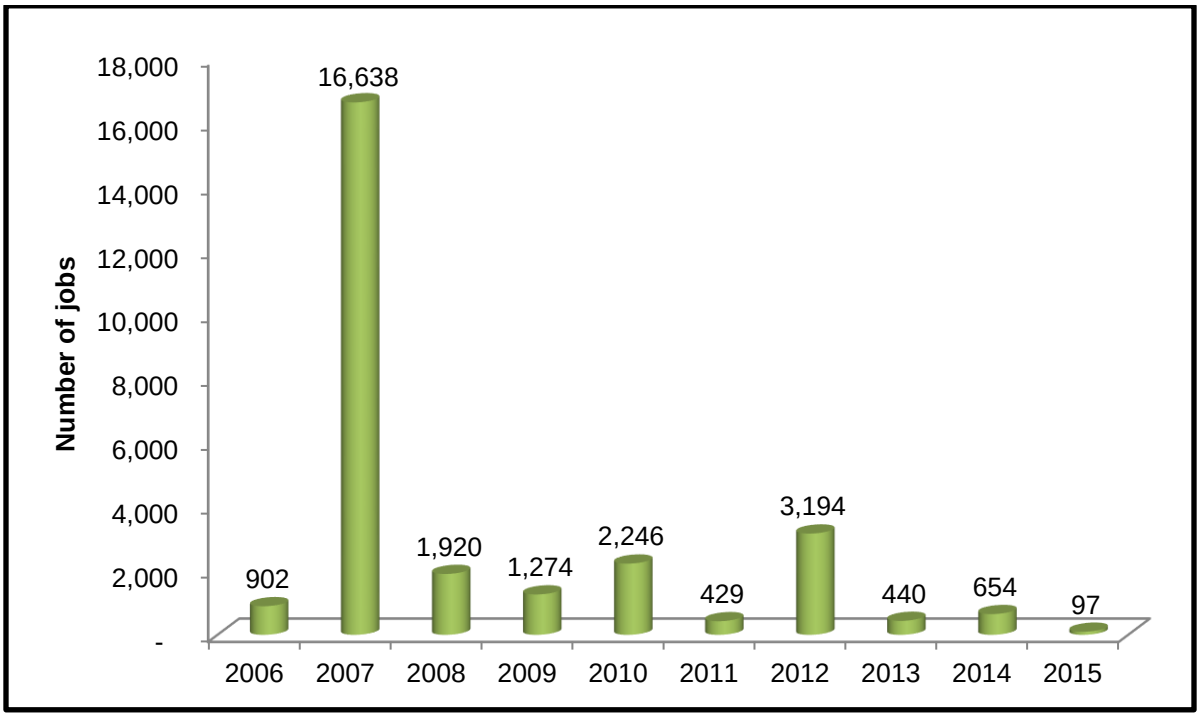


Source: Uganda Investment Authority

3.6 ICT planned employment

Over the last 9 years, the total number of planned jobs to serve in ICT related business has been fluctuating. The year 2007 had the highest number of planned jobs (16,638) followed by the year 2012 with 3,194 jobs. The year 2015 had the least number of planned jobs in ICT related business (figure 3.6).

Figure 3.6: Number of planned jobs in ICT related projects



Source: Uganda Investment Authority

4. TRADE IN ICT GOODS

This section presents a summary of ICT trade statistics based on actual flow of ICT goods as recorded by the Customs Department of the Uganda Revenue Authority (URA) and augmented by Non-Customs data sources. The compilation of ICT Trade statistics is based on the General Trade System and coded according to Harmonized System (HS) 2012 and Standard International Trade Classification, Revision Four (SITC Rev4) commodity nomenclatures. ICT goods are comprised of Telecommunications and sound-recording and reproducing apparatus and equipment; and Office machines and automatic data-processing machines which include telecommunications, audio and video, computer and related equipment; electronic components; and other information and communication technology goods. Software is excluded.

4.1 ICT goods exports

During the FY 2015/16, total formal ICT goods export earnings were estimated at US$ 11.1 million, of which, Office machines and automatic data-processing machines exports were worth US$ 5.4 million, while Telecommunications and sound-recording and reproducing apparatus and equipment exports were US$ 5.7 million. The overall ICT export goods earnings declined by 64 percent in 2015/16 compared to the previous financial year. The formal Office machines and automatic data-processing machines exports decreased by 15 percent from US$ 6.4 million in 2014/15 to US$ 5.4 million in 2015/16. On the other hand, informal exports decreased much by 77 percent from US$ 24.3 million to US$ 5.7 million. There were major fluctuations in formal Telecommunications and sound-recording and reproducing apparatus and equipment export with the lowest being recorded in 2013/14 estimated at US$ 23.4 million by 82 percent decline (see table 4.1 below).The decline in the total ICT goods export earnings was partly attributed to a 77 percent decrease in the Telecommunications and sound-recording and reproducing apparatus and equipment.

Table 4.1: Summary of formal ICT goods exports; 2010/11 – 2015/16 (US$ Million);

Type of ICT goods	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Office machines and automatic data-processing machines	6.3	2.6	3.5	4.5	6.4	5.4
Telecommunications and sound-recording and reproducing apparatus and equipment	102.4	131.1	128.2	23.4	24.3	5.7
Total ICT goods exports	**108.7**	**133.7**	**131.7**	**27.9**	**30.7**	**11.1**
Percentage change		23%	-1%	-79%	10%	-64%

Source: Uganda Bureau of Statistics

4.2 ICT goods imports

The total formal ICT goods imports bill in 2015/16 stood at US$ 208.5 million, of which, Office machines and automatic data-processing machines imports accounted for US$ 45.4 million, while Telecommunications and sound-recording and reproducing

apparatus and equipment imports were estimated at US$ 163.1 million. The total ICT goods imports expenditure declined by 14 percent in 2015/16 after another drop of 14 percent in 2014/15. On the other hand, Office machines and automatic data-processing machines imports sharply increased by 42 percent from US$ 70.7 million in 2012/13 to US$ 100.4 million in 2013/14. There was however, a decline of 29 percent from US$ 63.5 million in 2014/15 to US$ 45.4 million in 2015/16 (table 4.2).

Table 4.2: Summary of formal ICT goods imports; 2010/11 – 2015/16 (US$ Million);

Type of ICT goods	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Office machines and automatic data-processing machines	76.3	63.6	70.7	100.4	63.5	45.4
Telecommunications and sound-recording and reproducing apparatus and equipment	301.2	294.7	260.8	181.6	178.1	163.1
Total ICT goods imports	**377.5**	**358.4**	**331.5**	**282.0**	**241.7**	**208.5**
Percentage change		-5%	-7%	-15%	-14%	-14%

Source: Uganda Bureau of Statistics

4.3 ICT Sector Tax Revenues

Tax revenues in the ICT sector increased by 3.6 percent in 2015/16 from UGX864.4 billion to UGX895.9 billion. The communications services sub-sector contributed 90 percent of the ICT sector revenue (table 4.3).

Table 4.3: ICT sub-sector Tax Revenues; 2013/14 – 2015/16 (UGX);

Sub-Sector	FY 2013/14	FY 2014/15	FY 2015/16
ICT Manufacturing	**278,394,150**	**633,696,938**	**23,224,106**
Manufacture of electronic components and boards	*271,630,625*	*633,696,938*	*12,552,980*
Manufacture of computers and peripheral equipment	*6,763,525*		*10,671,126*
ICT Wholesaling	**72,478,284,263**	**64,685,468,011**	**40,926,559,336**
Wholesale of computers, computer peripheral equipment and software	*35,713,515,835*	*30,230,976,218*	*30,006,133,320*
Wholesale of electronic and telecommunications equipment and parts	*36,764,768,428*	*34,454,491,793*	*10,920,426,016*
Communications services	**719,584,022,272**	**792,107,199,738**	**805,575,586,050**
Wired telecommunications activities	*719,584,022,272*	*790,094,858,991*	*804,839,439,595*
Other telecommunications activities		*2,012,340,747*	*736,146,455*
Software and computer services	**9,974,450,318**	**7,029,251,180**	**49,356,080,582**
Computer programming activities	*259,2626*		*33,441,751,044*
Computer consultancy and computer facilities management activities	*439,642,816*	*1,002,907,946*	*9,278,786,739*
Other information technology and computer service activities	*7,484,382,654*	*4,503,739,551*	*2,636,978,464*
Data processing, hosting and related activities	*1,921,863,972*	*1,522,603,683*	*3,267,499,820*
Repair of computers and peripheral equipment	*125,968,250*		*731,064,515*
Grand Total	**802,315,151,003**	**864,455,615,867**	**895,881,450,074**

Source: Uganda Revenue Authority

5. INFORMATION AND COMMUNICATION SECTOR BUSINESS STATISTICS

The Information and communication sector includes the Publishing, Production and Distribution of Information, Telecommunications and Computer Programming Activities. The main components of this section are: Publishing of books, periodicals and other publishing activities, Motion picture and video television programme production, sound recording and music publishing activities, Programming and broadcasting activities, Wired and satellite telecommunication activities, Data processing, hosting & related activities and other information activities. Findings are based on the 2010/11 Census of Business Establishments.

5.1 Businesses in the Information and Communication Sector by activity

The 2010/11 Census of business establishments' results showed that nearly 4,200 businesses were registered in the Information and Communication sector, accounting for 1 percent of the total businesses. Further analysis showed that the highest proportion of businesses were those engaged in Television and Radio Programming activities accounting for 65 percent followed by businesses engaged in the Telecommunication activities accounting for 21 percent. However, the least proportion of businesses was of those engaged in Publishing Activities accounting for only 3 percent.

The Census results also showed that the highest proportion of businesses (35 percent) was located in Kampala region followed by the Central region with 30 percent. The least proportions of businesses were those located in the Northern region with only 6 percent. However, in all the regions the Television and Radio Programming Activities were dominant as seen in table 5.1.

Table 5.1: Businesses in the Information and Communication Sector by activity, 2010/11

Activity	Kampala	Central	Eastern	Northern	Western	Total	Percent
Publishing	60	9	5	5	27	106	**2.6**
Television & Radio	606	968	551	185	367	2,677	**65.1**
Telecommunication	524	185	74	28	66	877	**21.3**
Computer programming & computer activities	256	73	53	32	35	449	10.5
Total	**1,446**	**1,235**	**683**	**250**	**495**	**4,109**	**100**
Percent	**35.2**	**30.1**	**16.6**	**6.1**	**12.0**	**100.0**	

Source: Uganda Bureau of Statistics

5.2 Workforce in Information and Communications Sector Business

A total of about 14,400 persons were engaged in the Information and Communication sector accounting for 1.3 percent of the total Census of Business Establishments (COBE) employment. The results showed that the highest proportion (47 percent) of employees was engaged in Television and Radio Programming Activities followed by businesses engaged in Telecommunication Activities accounting for 29 percent. However, the findings showed that Publishing Activities had the least employees, only 10 percent of the sector employment in this sector.

The distribution of employees by sex showed that majority were male, accounting for 73 percent and most of them were engaged in Television and Radio Programme activities. However, female employees were few in the sector and about 41 percent of them were engaged in Telecommunication Activities alone as shown in table 5.2.

Table 5.2: Employment in Information and Communications sector Business; 2010/11

Activity	Male	Percent	Females	Percent	Total	Percent
Publishing	1,011	9.6	435	11.3	1,446	**10.0**
Television & Radio	5,652	53.6	1,169	30.3	6,821	**47.4**
Telecommunications	2,657	25.2	1,578	40.8	4,235	**29.4**
Computer programming & other computer activities	1,218	11.6	681	17.6	1,899	**13.2**
Total	**10,53**	**100**	**3,863**	**100**	**14,401**	**100**
Percent	**73.2**		**26.8**		**100.0**	
COBE Employment	599,30		477,230		1,076,534	
Percent COBE	1.8		0.8		1.3	

Source: Uganda Bureau of Statistics

5.3 Average Employment in Information and Communication Sector Business

On average, 4 persons were employed per business in the Information and Communication sector. Further analysis showed that the Publishing activities had a higher average of 14 persons per business, followed by Telecommunication activities with 5 persons. The activity with the least proportion of employees was Television and Radio Programme, table 5.3.

Table 5.3: Average Employment in the Information and Communication Sector; 2010/11

Activity	Business	Employment	Average employment
Publishing	106	1,446	14
Television & Radio programme	2,677	6,821	3
Telecommunications Computer programming & other computer activities	877	4,235	5
Total	**4,109**	**14,401**	**4**

Source: Uganda Bureau of Statistics

5.4 Information and Communication sector Businesses by Employment Size

In this sector, the findings also showed that majority (90 percent) of businesses were employing less than 5 persons. This was followed by those employing 5 to 9 persons accounting for 5 percent. However, businesses employing more than 50 people accounted for one percent of the businesses (table 5.4).

Table 5.4: Distribution of Businesses by Employment Size

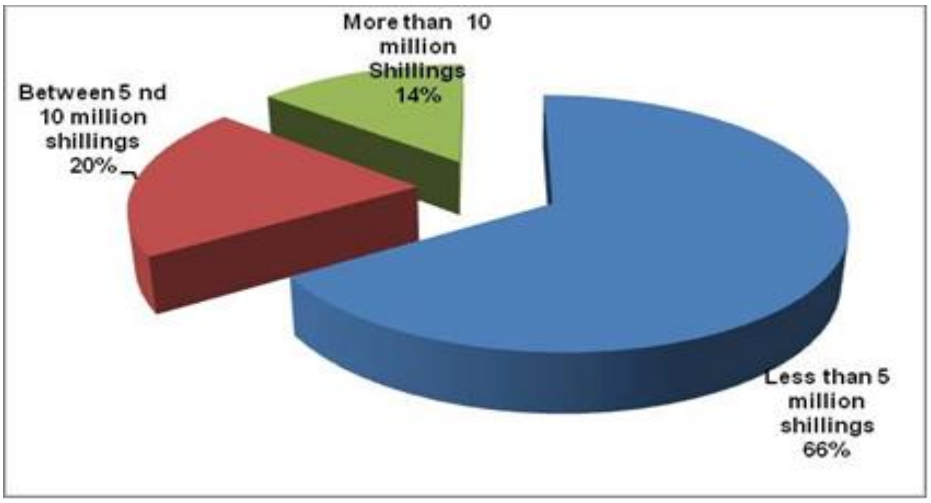
Activity	1-4	5-9	10-19	20-	=>50	Total
Publishing	51	22	14	15	4	106
Television & Radio programme	2,516	57	52	48	4	2,677
Telecommunications	785	53	22	8	9	877
Computer programming & other computer activities Computer programming & other computer	347	67	19	15	1	449
Total		**19**	**107**	**86**	**18**	**4,109**
Percent		**4.8**	**2.6**	**2.1**	**0.4**	**100.0**

Source: Uganda Bureau of Statistics

5.5 Annual Turnover of businesses in the Information and Communication Sector

The distribution of the businesses by annual turnover showed that the highest proportion were those with an annual turnover of less than 5 million shillings, accounting for 66 percent. This was followed by businesses with an annual turnover of 5 to 10 million shillings accounting for 20 percent. However, only 14 percent of the businesses had an annual turnover of more than 10 million shillings. A majority of the businesses with an annual turnover of less than 10 million shillings were engaged in Television and Radio Programming, while those with an annual turnover of more than 10 million were engaged in the Telecommunication activities (figure 5.5).

Figure 5.5: Distribution of Businesses by Annual Turnover

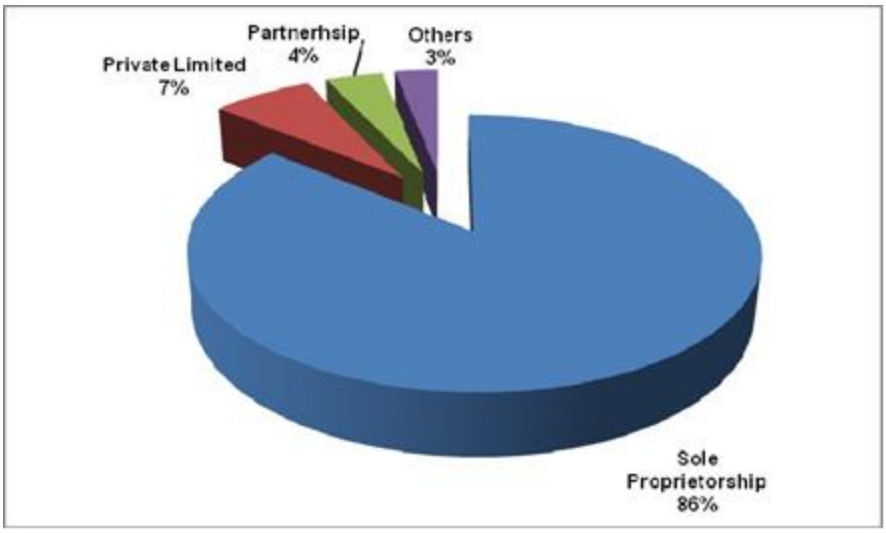


Source: Uganda Bureau of Statistics

5.6 Legal ownership of businesses in the Information and Communication Sector

About 86 percent of the businesses in the Information and Communication Sector were owned as Sole Proprietorships while those owned as Private Limited Companies accounted for only 7 percent, figure 5.6.

Figure 5.6: Distribution of Business by type of Legal Ownership; 2010/11



Source: Uganda Bureau of Statistics

5.7 Computer in Information and Communication Sector Businesses

The results from the 2010/11 Census of Business Establishments showed that 27 percent of the total registered businesses in the Information and Communication sector owned and used computers while 73 percent neither owned nor used computers. Further analysis of the businesses that used computers indicated that Television and Radio Programming, and, Telecommunication Activities were the major users of computer services, representing 41 percent and 30 percent respectively.

5.8 Age and ownership of the Businesses in the Information and Communication Sector

The 2010/11 Census of Business Establishments findings showed that 58 percent of the businesses were less than 5 years of age and 68 percent of them were engaged in Television and Radio Programming Activities.

The distribution of businesses by Nationality of ownership showed that 96 percent of the businesses were owned by Ugandans and they were mainly engaged in the Television and Radio Programming Activities followed by Telecom Activities. Other Nationalities

owned only 4 percent of the businesses in the sector. The findings also showed that only 3 percent of the businesses were members to an association and in addition, results showed that 86 percent of the business owners were male compared to only 14 percent female.

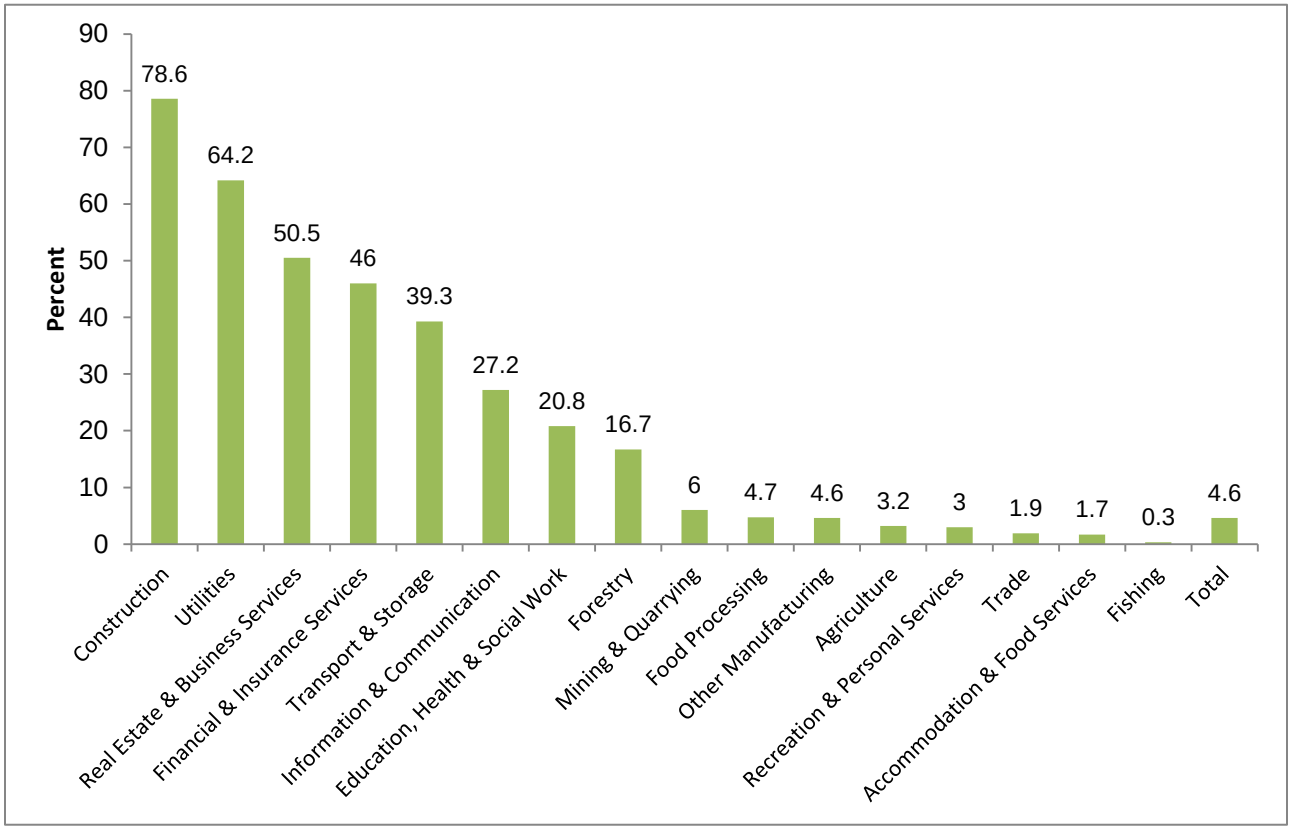
6. INFORMATION TECHNOLOGY USAGE IN BUSINESS

This section assesses the use of Information Technology in businesses mainly through computers and internet. In the 2010/11 Census of Business Establishments, information was collected on the status of ownership of computers and internet use by businesses.

6.1 Ownership of Computers in Business by Industry

Information obtained from the 2010/11 Census of Business Establishments, shows that overall, only 5 percent of the businesses owned computers. Computer usage was highest (79 percent) in the Construction businesses sector followed by those in Utilities with 64 Percent. Out of those businesses without computers, the businesses in the Fishing, services, trade and Agriculture sector dominated (figure 6.1).

Figure 6.1: Percentage distribution of Ownership of Computers by Business Sector; 2010/11



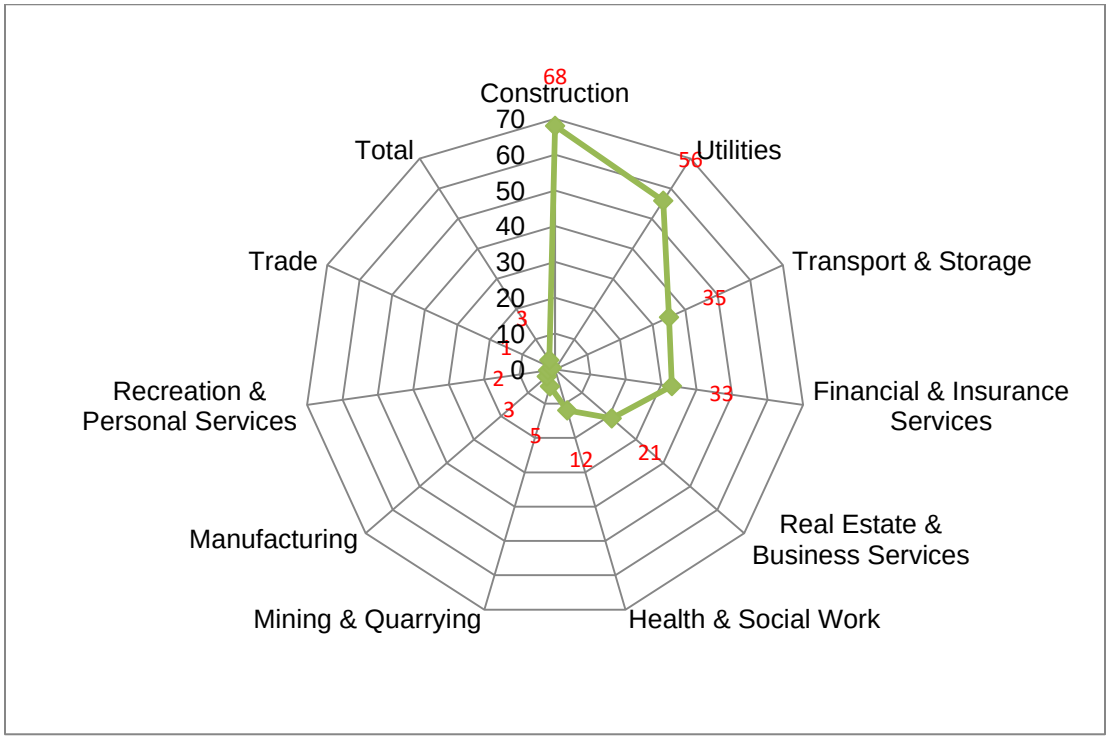
Source: Uganda Bureau of Statistics

6.2 Internet Usage in Business

Analysis on internet usage of the 2010/11 Census of Business Establishments showed that only 3 percent of the businesses used internet for business operations. Further analysis indicated that 68 percent of the establishments in the construction sector used internet services in their business. Information on Internet use also showed that more than half of the businesses (56 percent) in the utility sector used internet services. Businesses in the collection, purification and distribution of water took a lead in using internet facilities in the utility sector accounting for 48 percent. Results also showed that 35 percent of the businesses in the Transport and Storage sector used internet services. Internet usage in the Financial & Insurance sector was 33 percent.

The results also showed that 21 percent of the businesses in Real Estate and Business Services sector used internet. The results showed that only 12 percent of registered businesses in Health and Social Work Sector did use internet services. Only 5 percent of the businesses in Mining and quarrying sector used internet in their businesses. Information showed that only 3 percent of the businesses in the manufacturing sector used internet. Further analysis by periodicity of use showed that of the businesses that used internet in the manufacturing sector, 88 percent of them used it daily while 8 percent used it weekly and only one percent used it monthly In the Recreation and Personal Services sector, out of the total number of registered businesses, only 2 percent used internet services in their businesses. Only one percent of businesses in the trade sector used internet in their businesses (figure 6.2).

Figure 6.2: Percentage distribution of Internet usage by Business Sector; 2010/11



Source: Uganda Bureau of Statistics

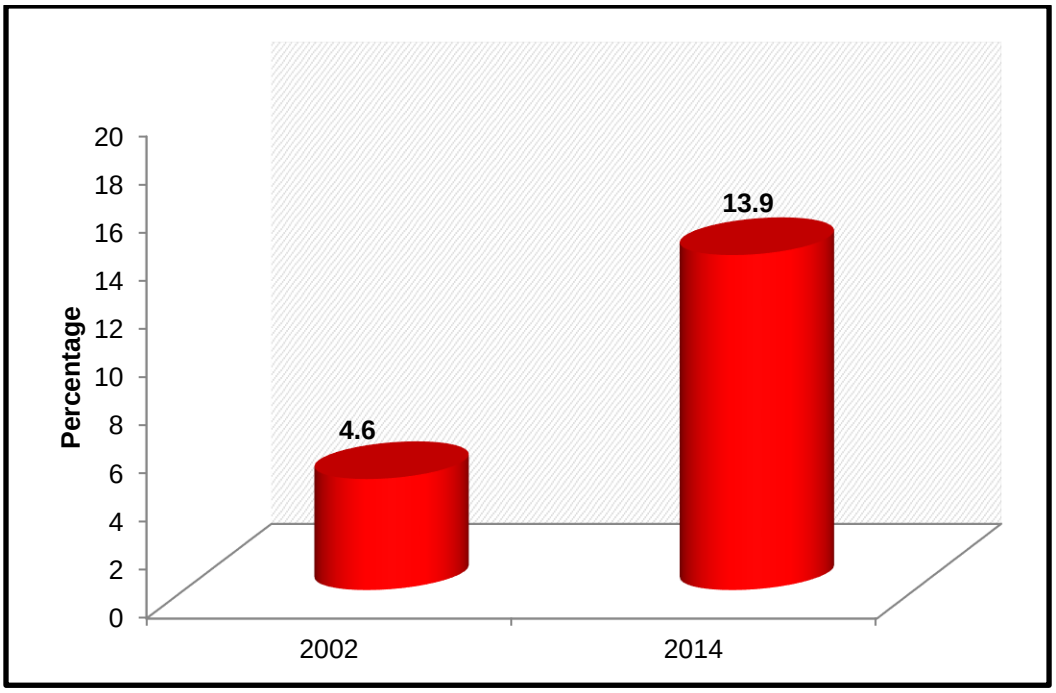
7. INFORMATION TECHNOLOGY ACCESS AND USAGE FOR HOUSEHOLDS AND INDIVIDUALS

This section presents a summary of the access and use of computers, the internet and mobile phones in Uganda households. This information is used to understand how IT is changing Uganda's economy and society from the demand side.

7.1 Ownership of Television sets by Households

The proportion of households with a working television set increased marginally by 9 percent from about 5 percent recorded in 2002 to 14 percent in 2014. However, ownership of television sets by households remained relatively higher in urban areas than rural areas. Specifically, about 40 percent of the households in urban areas indicated that they had a working television set compared to only 6 percent of the households in rural areas (figure 7.1).

Figure 7.1: Proportion of Households owning Televisions; 2002-2014

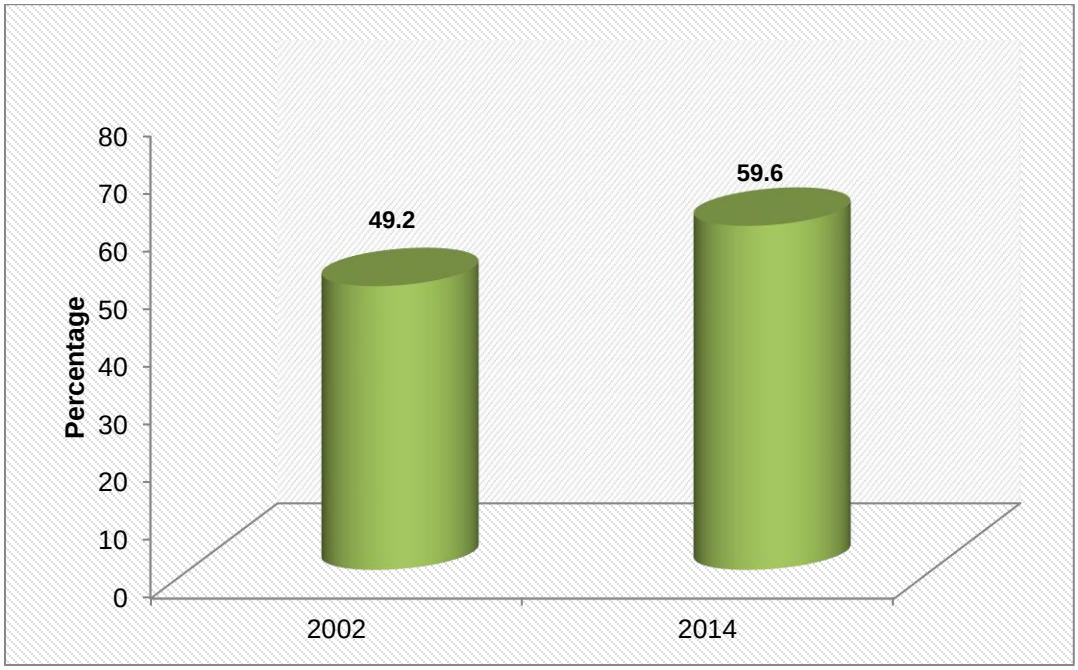


Source: Uganda Bureau of Statistics

7.2 Ownership of Radios by Households

The proportion of households owning a working radio increased from 49 percent reported in 2002 to about 60 percent in 2014. Radio ownership among households remained relatively higher in urban areas than in rural areas constituting 64 percent in urban areas and 58 percent in rural areas (figure 7.2).

Figure 7.2: Proportion of Households owning Radios; 2002-2014

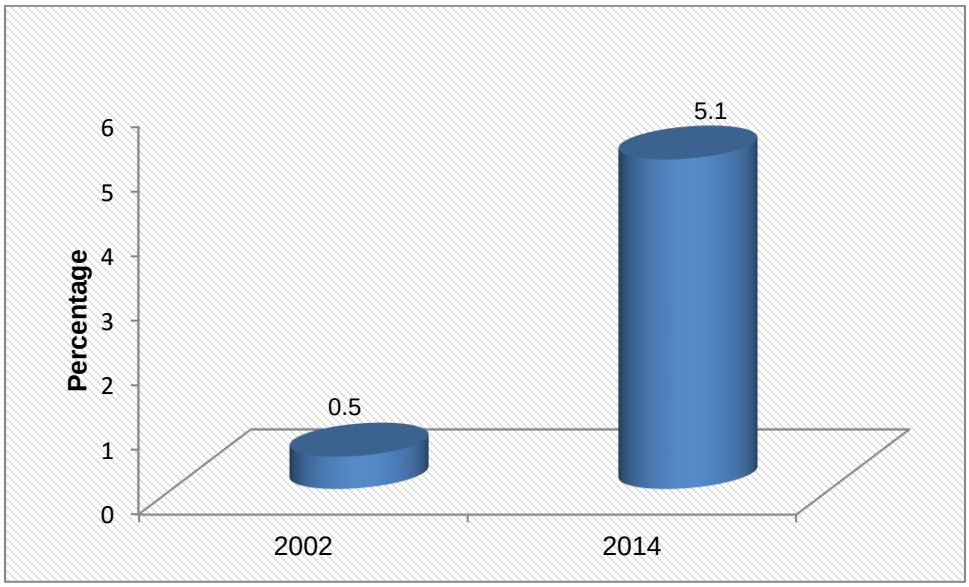


Source: Uganda Bureau of Statistics

7.3 Ownership of Fixed phones by Households

The proportion of households with functional telephones lines increased from about 1 percent in 2002 to only 5 percent in 2014. The proportion of households with fixed telephone lines in urban areas was not different from that of households in rural areas (figure 7.3).

Figure 7.3: Proportion of Households owning Fixed phones; 2002-2014



Source: Uganda Bureau of Statistics

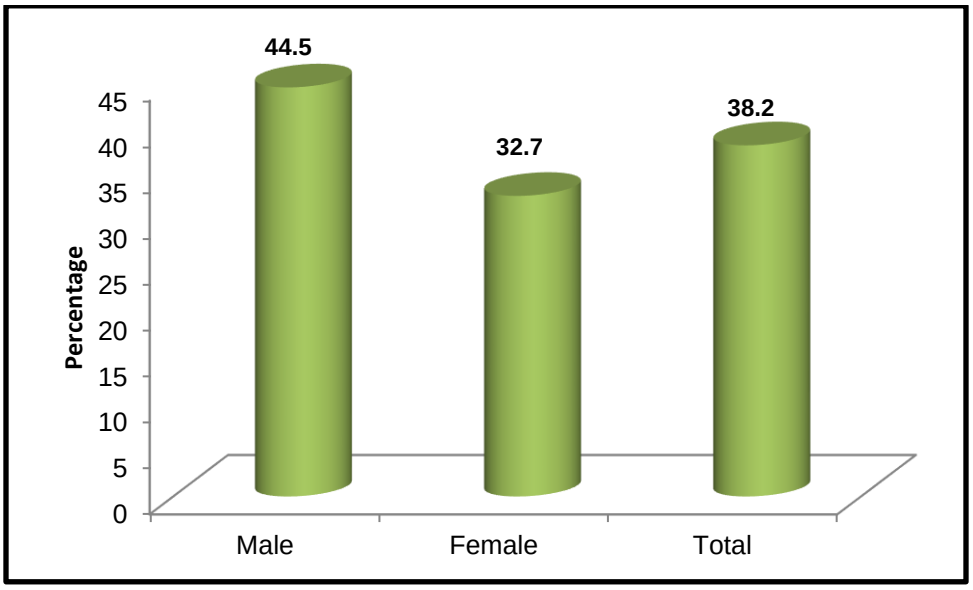
7.4 Ownership of Mobile Phones by Households

According to national population and housing census results for 2014, 69 percent of the households in the country owned mobile phones determined by at least one member of the household owning a mobile phone. The majority of the households that had access to mobile phones were located in the urban areas.

7.5 Usage of Mobile Phones by Individuals

According to national population and housing census results for 2014, about 38 percent of people aged above 10 years in Uganda were active users of mobile phones, defined as having used a mobile phone in the previous three months from the time of the census. The proportion of active users of mobile phones was relatively higher in among males than females corresponding to 45 percent of the male people aged above 10 years compared to about 33 percent of the female people aged above 10 years. Similarly, mobile phone usage among the active users of mobile phones was relatively higher in urban areas than rural areas (see figure 7.5).

Figure 7.5: Persons (aged 10 years and above) with at least a mobile phone; 2014



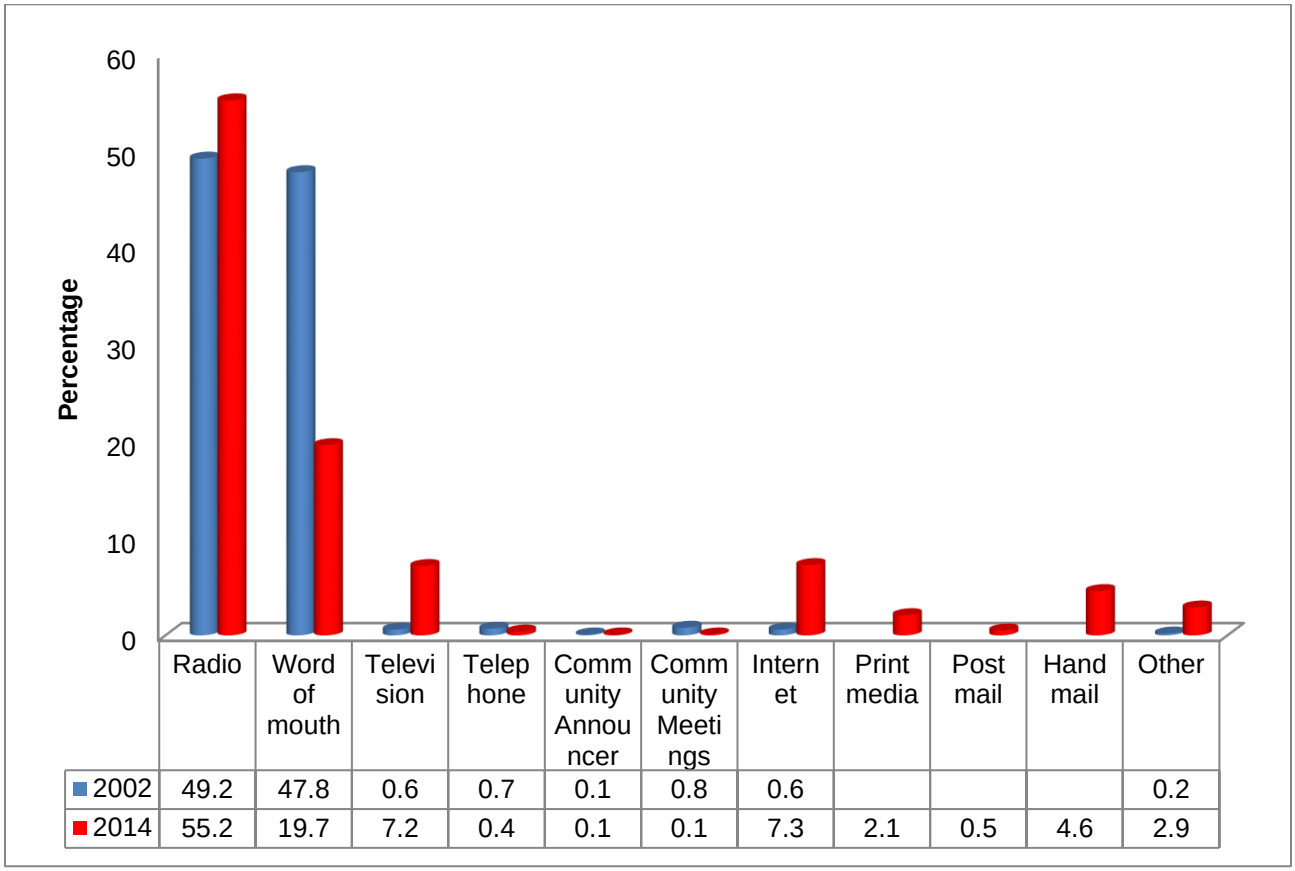
Source: Uganda Bureau of Statistics

7.6 Main Source of Information by Households

Internet as a main source of information slightly improved from about 1 percent in 2002 to 7 percent in 2014. The main source of information remains radio at 55 percent followed by Word of mouth at about 20 percent and TV at 7 percent.

Internet has taken over TV and there was a significant decline in the proportion of households who depend on Word of mouth as a main source of information from about 48 percent in 2002 to 20 percent in 2014, figure 7.6.

Figure 7.6: Percentage distribution of Main Source of Information in the Household; 2002-2014



	Radio	Word of mouth	Television	Telephone	Community Announcer	Community Meetings	Internet	Print media	Post mail	Hand mail	Other
2002	49.2	47.8	0.6	0.7	0.1	0.8	0.6				0.2
2014	55.2	19.7	7.2	0.4	0.1	0.1	7.3	2.1	0.5	4.6	2.9

Source: Uganda Bureau of Statistics

7.7 Individual Ownership of Computers

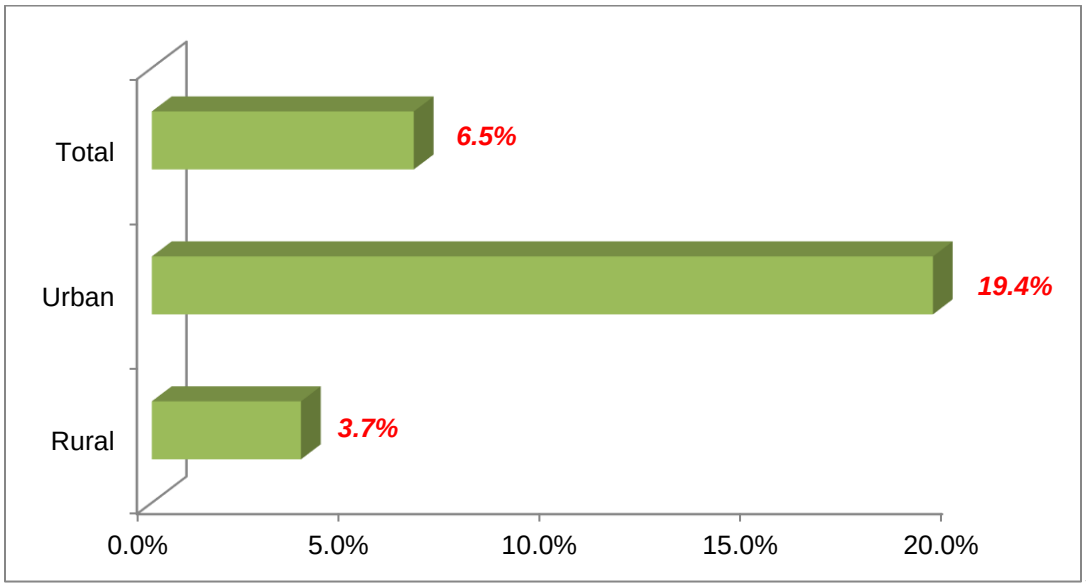
Most individuals did not own any computing devices. According to the survey findings on the access and usage of communication services across Uganda, in 2014 only 3.8 percent of individuals owned a computer. The majority of the individuals that owned computers were in urban based households.

7.8 Internet Usage by individuals

In 2014, Internet access was still low and largely urban dominated. Only 6.5 percent of the individuals had used the Internet in the past 3 months from the time of the survey. Further analysis shows that 19.4 percent of urban

individuals had used the Internet compared to only 3.7 percent of their rural counterparts (figure 7.8).

Figure 7.8: Percentage distribution of Individual Internet usage; 2014

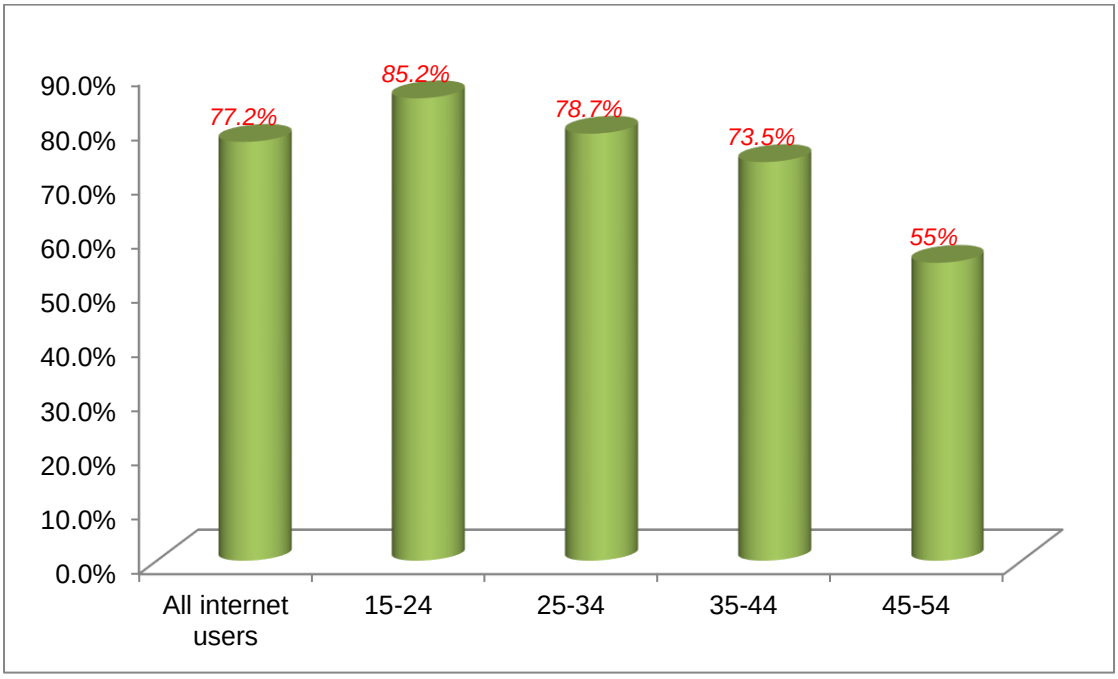


Source: Uganda Communications Commission

7.9 Individual membership to social media

A large proportion of internet users accounting for 77 percent of all internet users indicated to be members of at least one social media network. Social media membership was mainly concentrated among the young population. For internet users aged 15-24, 85 percent of them had membership to social networking sites. For those aged 25-34, 79 percent of them had membership. For those aged 35-44, 74 percent of them did, and for those aged 45-54, 55 percent of them had membership to social networking sites (see figure 7.9).

Figure 7.9: Percentage distribution of individual membership to social media by age group; 2014



Source: Uganda Communications Commission

8. INFORMATION TECHNOLOGY IN HIGHER EDUCATIONINSTITUTIONS

This section presents the general picture on the computers and associated accessories; and enrolment by discipline in higher education institutions.

8.1 Computer access and usage in higher education institutions

The use of computers for teaching, learning, storage and searching for new knowledge in higher education cannot be understated. The resourcefulness of a computer is enhanced by connectivity to Internet where downloadable information and textbooks can be easily be accessed. The National Council for Higher Education (NCHE) has provided minimum standard requirements for computer access (1:10). The majority of institutions are still striving to reach this level. In academic year 2013/14, there was a 7 percent increase in total computer units in institutions of higher learning from 14,941 in academic year 2012/13 to 15,913. The number of computers

dedicated to staff rose to 4,716 from 2,372 in 2012/13 (a 50 percent increase) while 1,682 were “shared” between staff and students. The number of computers linked to Internet more than doubled (9,254) that reported in 2012/13, which, was at only 4,210.

Furthermore, in academic year 2013/14, overall access to computers by students improved from 1:20 in 2012/13 to 1:16. Although this improvement is small, if such augmentation is sustained it could yield a big difference in a long run. In the university category alone, the computer access ratio was 15 students per computer, which, is better than the figure reported in the previous year. The other categories equally had small improvements in the ratios; in technical colleges 1:17, Health institutions 1:16, Business/Commerce institutions 1:15, Media 1:10. Many institutions still have challenge with power outage and poor maintenance culture (see table 8.1).

Table 8.1: Access to Computers in higher education institutions; 2011/12-2013/14

	2011/12	2012/13	2013/14	Change
Student Computers	14,989	14,941	15,913	7%
Computers dedicated to staff	2,114	2,372	4,716	50%
Shared computers	1,708		1,682	
Computers linked to the internet		4,210	9,254	55%
Student Computer access Ratio	10	20	16	-20%

Source: National Council for Higher Education

8.2 Enrolment by academic discipline

In the academic year 2013/14, the enrolment in both arts and science increased in absolute terms from 2012/13, however the percentage proportions remained unchanged. Science enrolment increased by 11 percent in 2013/14 as compared to 60 percent in 2012/13; however this increase in science enrolment was attributed to computer related science (table 8.2).

Table 8.2: Art/Humanities enrolment compared with Science enrolment; 2011/12-2013/14

Academic year	Discipline	Number	Percentage
2011/12	Arts/Humanities	146,744	68%
	Science/Technology	51,322	32%
2012/13	Arts/Humanities	138,162	63%
	Science/Technology	82,039	37%
2013/14	Arts/Humanities	156,084	63%
	Science/Technology	913,89	37%

Source: National Council for Higher Education

9. UGANDA'S ICT RANKINGS ON THE GLOBAL SCALE

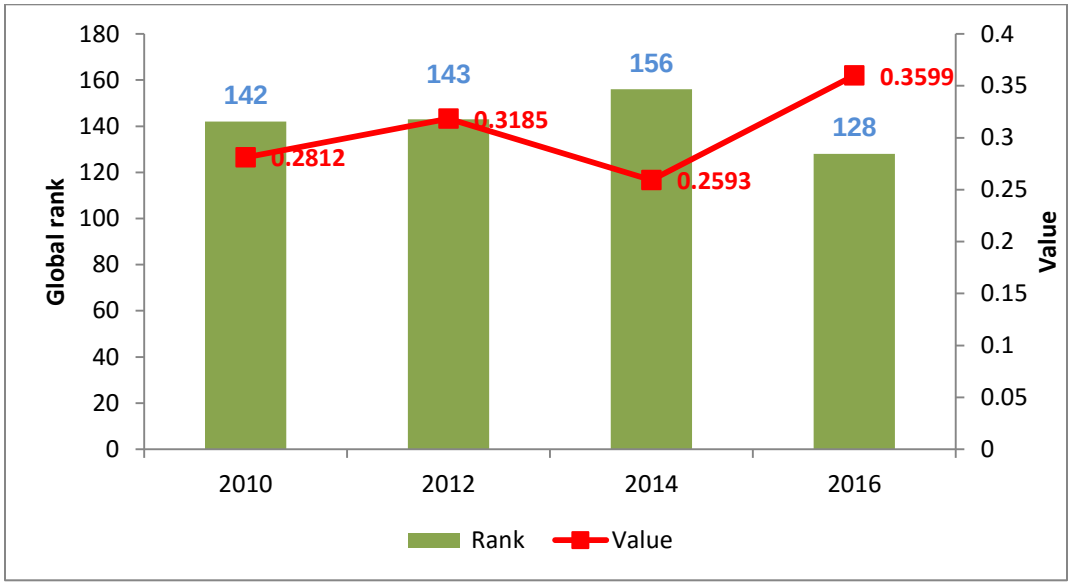
This section comprises of areas that assess ICT performance globally in terms of e-government development index by the United Nations, Networked Readiness Index by the World Economic Forum and ICT Development Index by International Telecommunications Union (ITU).

9.1 United Nations e-government development Index

The United Nations e-government development index is widely recognized as an authoritative measure of public sector capacity to provide electronic and mobile services. It assesses the Online Service, Telecommunication Infrastructure and Human

Capital Components as part of e-government performance. The UN e-Government Survey 2016 Report reflects that Uganda greatly improved by 18 positions in its global e-government development index from rank 156 globally to rank 128. The 2016 E-Government status for Uganda is estimated at 36 percent compared to the World's average of 49.2 percent. The status was 25.9 percent in 2014 and 31.8 percent in 2012 (figure 9.1).

Figure 9.1: Uganda's egovernment ranking; 2010-2016

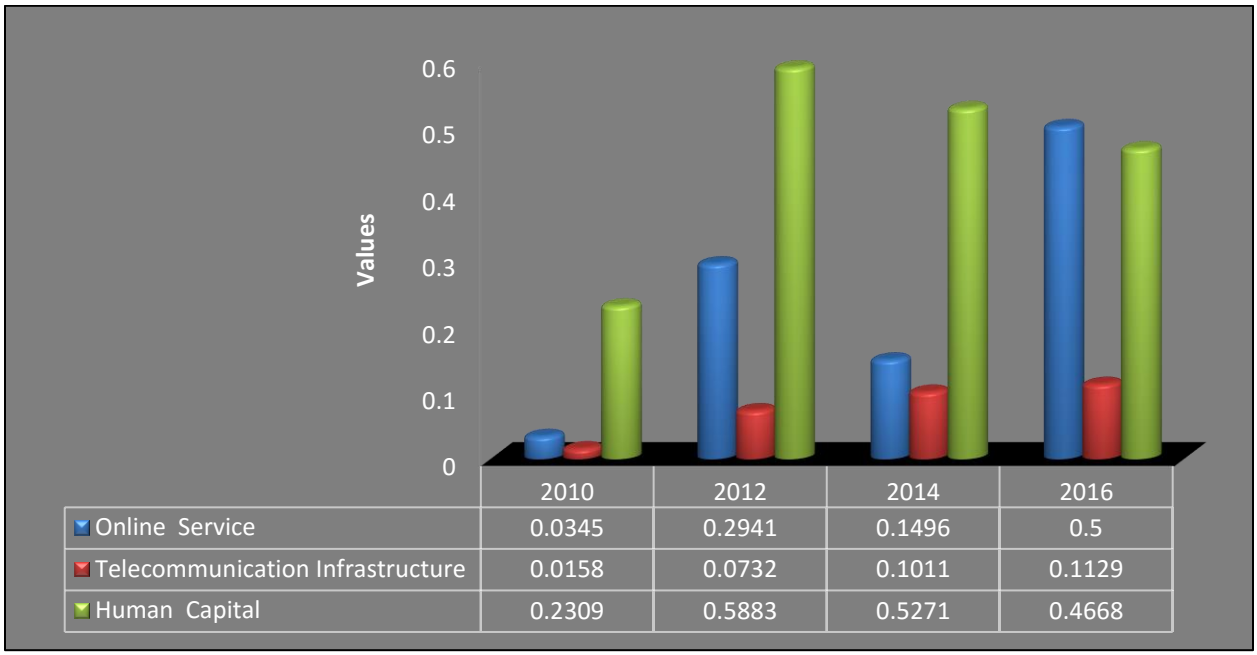


Source: UN Reports

9.1.1 Uganda's egovernment ranking by components

The Online Service status for Uganda has improved from 14.9 percent in 2014 to 50 percent in 2016 compared to the 20 percent average for Least Developed Countries (LDCs). In addition, Telecommunication Infrastructure status is estimated at 11.2 percent from 10.1 percent in 2014 and Human Capital component declined from 52.7 percent in 2014 to 46.7 percent in 2016 compared to the LDCs' average of 11.5 percent and 38.8 percent respectively (figure 9.1.1).

Figure 9.1.1: Uganda's egovernment ranking by components; 2010-2016



	2010	2012	2014	2016
Online Service	0.0345	0.2941	0.1496	0.5
Telecommunication Infrastructure	0.0158	0.0732	0.1011	0.1129
Human Capital	0.2309	0.5883	0.5271	0.4668

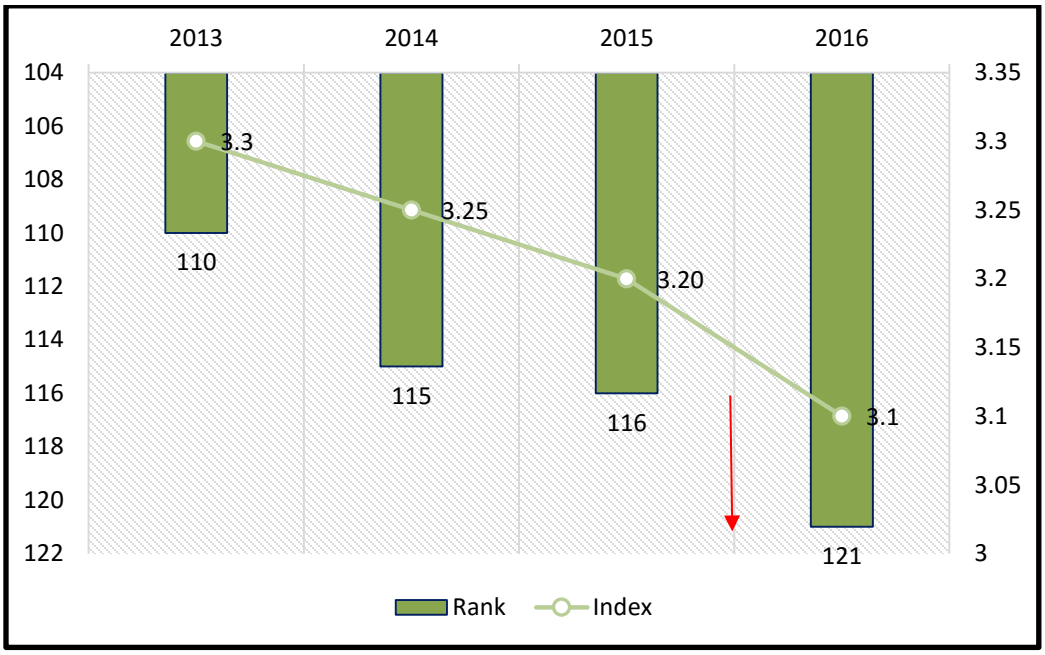
Source: UN Reports

9.2 Networked Readiness Index

The Networked Readiness Index (NRI) evaluates how conducive a country is to the development of a network of information and communication technologies. It seeks to better understand the impact of ICT on the competitiveness of nations and is a composite of three components: the environment for ICT offered by a given country (political and regulatory; business and innovation environment); the readiness of the country's key stakeholders (individuals, businesses, and governments) to use ICT and the usage of ICT among these stakeholders.

In 2016, globally, Uganda dropped its ranking in the overall NRI from the 116th position out of 143 countries in 2015 with a score of 3.2 out of 7 to the 121th position out of 139 countries with a score of 3.1 out of 7 (figure 9.2). Tragic affordability is contributing to this dwindling in Uganda in a major way.

Figure 9.2: Uganda's networked readiness Index; 2013- 2016



Source: World Economic Forum reports

9.2.1 Uganda's Networked Readiness by sub-Indices and respective pillars

In 2016, Uganda had a notable move in the regulatory and business environment improving 5 places to reach 101st position as economic and social impacts of ICTs are starting to be realized (up14 in the global Political and regulatory environment rankings).

Uganda improved in the regulatory and business environment (101th out of 139) with a score of 3.7 out of 7 compared to a rank of 106 out of 144 in 2015 and a score of 3.6.
In terms of political and regulatory environment Uganda significantly improved its ranking from 86 in 2015 to 72 in 2016.

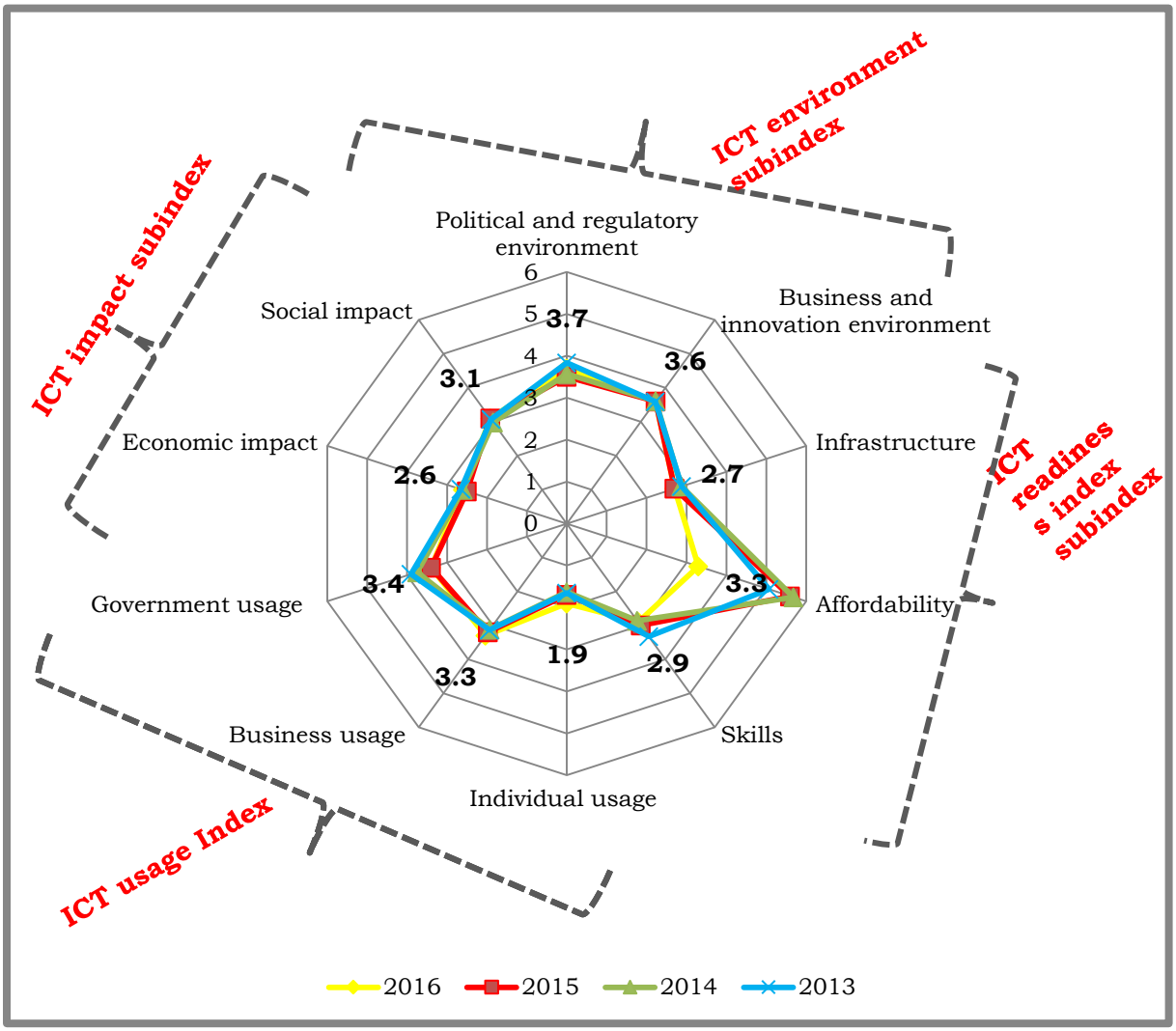
In 2016, overall ICT usage in Uganda improved from a rank of 122 out 144 in 2015 to 120 out of 139 with a score of 2.7 and 2.9 out 7 respectively. On the other hand, government usage improved from a rank of 107 out 144 in 2015 to 97 out of 139 but maintained a score of 3.4 out of 7. Individual usage in Uganda is still one of the lowest

in the world (rank 129 out 139), but has been growing strongly in recent years. Furthermore, Business usage has been growing by an average score of 0.1 over the years. In 2016, there was an improvement in business usage ranking from 110th out 144 in 2014 to 106th out of 139.

ICT readiness by the government, the business sector, and the population at large as measured by ICT affordability, skills, and infrastructure in 2016 significantly declined from the position of 88th in 2015 to 124th in 2015. This was a result of a substantial decline of 2 points in the affordability score from 5.6 in 2015 to 3.6 in 2016 attributed to high prices of fixed internet bandwidth.

The impact that ICTs actually have on the economy and society in 2016 improved from a rank of 123 in 2015 to 120 with an increase of 0.1 points in the score of 2.8 (figure 9.2.1).

Figure 9.2.1: Uganda's rank by networked readiness sub-Indices and pillars; 2013- 2016



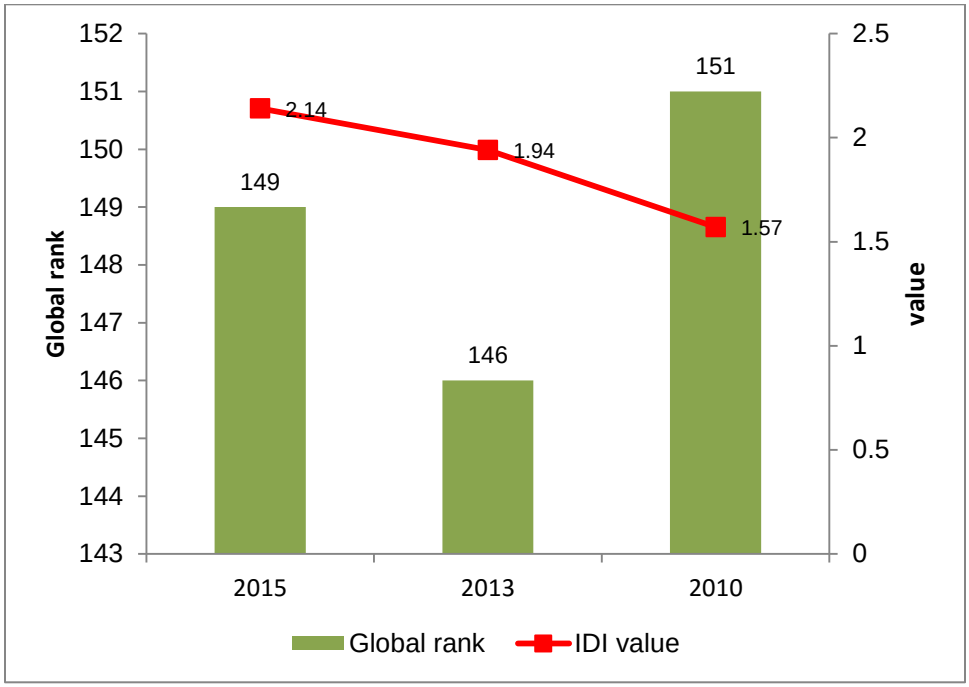
Source: ITU reports

9.3 ICT Development Index

The ICT Development Index (IDI) is a composite index combining 11 indicators into one benchmark measure that serves to monitor and compare developments in information and communication technology across countries. The IDI is composed of ICT access, ICT use and ICT skills components.

According to the International Telecommunication Union, Uganda declined from the rank of 146 out of 166 countries in 2013 to 149 out of 167 countries in 2015. The IDI for Uganda, which ranges from 0 (lowest ICT development) to 10 (highest ICT development) was 1.49 in 2013 compared to 2.14 in 2015 globally. In 2015, the ICT access sub index was 2.35, ICT use sub index was 1.10 and ICT skills was 3.81 out of 10 (figure 9.3).

Figure 9.3: Uganda's ICT Development Index; 2013-2015



Source: ITU reports