Ministry of Communication and Technology

Survey on ICT Usage in the Somaliland Government Institutions

Final Report

April 2019

A survey carried out for the Ministry of Communication and Technology by the College of Computing and IT (University of Hargeisa).

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Abbreviations and acronyms

ICT	Information Communication Technology
M&E	Monitoring and Evaluation
MoCT	Ministry of Communication and Technology
CCIT	College of Computing and Information Technology
UOH	University of Hargeisa
UN	United Nations
LAN	Local Area Network
WAN	Wide Area Network
SLA	Service Level Agreement
IS	Information System

Acknowledgements

In the name of ALLAH, the Most Gracious and the Most Merciful

First and foremost, we would like to thank ALLAH Almighty for giving us the strength, knowledge, ability and opportunity to undertake this research study and to complete successfully.

Several government institutions and individuals contributed in successfully conducting this research study. We gratefully acknowledge Honorable minister Dr. Abdweli Sufi and the Ministry of Communication and Technology for awarding this study to the College of Computing and Information Technology at the University of Hargeisa and for the confidence placed in us. We are also grateful to Honorable minister Dr Abdiweli for his invaluable contribution to make the study a success.

We are grateful to Mr. Ali Dahir – Director General, Ministry of Communication and Technology for his valuable guidance and encouragement throughout the study.

A special word of thanks to all the institutions that take part this study for providing a valuable data that served as the heart of this study. We sincerely thank all of them and highly appreciate their contribution towards this endeavor.

Last but not least we would like to express our special gratitude to all the enumerators and supervisors, and also to the members of the Ministry of Communication and Technology staff for working with a high level of commitment that enabled us to complete this study successfully.

Executive Summary

So far the extent to which the Somaliland Government institutions uses information and communications technology (ICT) is not known. This study aims to explore the actual depth the different ministries, government agencies, commissions, and other institutions covered under this survey use ICTs in their daily work. While it could be an input for future e-Government policy, at the moment this study will shed some light on the extent of usage of ICT by government institutions.

This report presents the general use of ICT applications in the day to day working environment; e-mail and Internet access availability; hardware and the kind of networking environment; the level of software applications usage and related security issues; the existence and availability of separate ICT unit s which handles ICT work in the different government institutions, ICT related training provided by the various government institutions; allocation of ICT funds under the government budget and how they spend it and; finally the plans these institutions have in incorporating ICTs in their work in the future.

No prior report is available for comparison purposes. This report is considered as the first of its kind.

The purpose of this survey is to collect appropriate data and generate a comprehensive analysis report on ICT Usage in the Government institutions. The survey provides baseline information to identify and measure the potential areas for ICT development in the government sector and identify how ICT itself can contribute to enhancing government services. Furthermore it could be used to restructure current on-going projects and implement any changes necessary in project strategies, methodologies and approaches, and also support future ICT projects undertaken by the Government.

Key Findings

- 62% of all government institutions do not have separate ICT units while only 38% have such facility.
- 22.5% of staff in government institutions has a computer assigned. This means 22 out of every 100 can be assigned to a computer.
- Use of office suit applications such as word processing, spreadsheets, presentations and databases in day to day work is significantly high
- ONLY 33% of the institutions computer systems are connected to Local Area Network (LAN). The rest (67%) maintain their computer system on a ‘stand alone’ basis
- Microsoft Windows is used by 98% of institutions with 95% reported the use of unlicensed Software.
- 48% of central government institutions have databases maintaining data and information but they are not publicly accessible.

- 98% of all government institutions have internet access. Wireless AP is the most preferred type of connectivity to the Internet followed by fixed fiber-cable lines
- 30% of government institutions have installed an electronic surveillance system.
- 49% of government institutions have website which is a very low statistics. The majority of them use to publish institutional information
- Of the 49% government institutions who have website 70% have a fully dedicated person(s) for updating their websites
- 74% of government institutions reported that they have social media presence.
- Overall only 24% of the government institutions use institutional e-mails for official communication. A majority 76% DO NOT have institutional e-mails to officially communicate with each other and to external parties.
- Only 5% of Government institutions indicated they have a separate budget for ICT related activities. The rest use the institutions' miscellaneous allocations for ICT related expenditures.

1. Introduction

1.1. Background

Somaliland has adequate ICT related infrastructures among the horn of Africa communities but greatly underutilized. It's a well known fact, nowadays, that Information Communication Technologies (ICTs) are enablers for economic growth because of their crosscutting nature thus affecting all sectors. Adoption and proper utilization of ICTs will lead, among others, to economic growth and quality production of goods and services.

The Somaliland Government has the responsibility of creating a conducive environment that allows for the development of ICTs for national benefits. The Government needs to take the lead in establishing, reforming and regulating ICTs. Public institutions need to utilize the ICTs for the services they offer to the public. In order to take advantage of benefits of ICT the government must embrace e-Government systems as a means of improving services, reducing costs, saving time and increasing effectiveness and efficiency in the public sector. Broadly defined e-Government generally refers to the government's use of information technologies to exchange information and services with citizens, businesses, general public and other arms of government.

In order to draft and implement e-government systems or initiatives the Ministry of Communication and Technology has acknowledged the availability of reliable data on the current ICT usage in the government sector as pre-requisite.

Therefore, this survey on ICT Usage in the Government institutions was initiated and totally funded by the Ministry of Communication and Technology.

1.2. Objectives of the Survey

The main objective of this survey was to determine the general level of usage of information and communications technology (ICT) in the public sector. Specifically the findings of the survey would provide detailed information and data for the ministry of communication and technology (MoCT) in carrying out its mandate to govern the ICT sector. The Specific objectives were:

- To provide a snapshot of the current status of ICT usage and adoption in government institutions.
- Inventory of computing resources (Hardware/Software) availability and status on the networking environment.
- To provide baseline information to identify and measure the potential areas for ICT development in the government sector.
- Identify how ICT itself can contribute to enhancing government service delivery.
- Identify challenges and opportunities facing public sector vis-à-vis the use of ICT.
- Propose recommendations or key action plans regarding ICT adoption and use
- To raise awareness as to the bottom line motivations and capacities that has to be in place in order to initiate e-government development process.
- To assess the current on-going government ICT projects

1.3. Project Inception

The project commenced with a presentation from the project team from College of CIT where the project methodology, supervision, and timelines of the project were presented to the ministry of communication and technology. The project methodology was presented by project team and accepted by the ministry of communication officials. According to the terms of reference, the e-government readiness assessment was expected to take place over a period not exceeding ninety (90) days starting from the date of contract engagement.

2. Survey Methodology

The key objective of the study is to produce information on ICT usage in Government institutions. Since the level of ICT usage within the Government does not vary this survey considered all government institution as a whole. As agreed with the Ministry of Communication and Technology, the sampling frame in this survey was 44 government institutions (presidency, ministries, commissions, government agencies). Public bodies including hospitals, schools, and universities were not included.

A total of 43 completed questionnaires were collected from the above sample.

2.1. Indicators

Below are the selected core ICT usage indicators

ICT capacity indicators

1. Percent of staff in government institutions with a computer
2. Percent of staff in government institutions with Internet access at the office by type
3. Percent of government institutions with websites and/or databases
4. Percent of government institutions with corporate networks (LAN, intranet, extranet)
5. Availability of separate ICT units in government institutions
6. Number of ICT personnel in government institutions

7. Prevention activities of intrusions and hacking of networks and websites of government institutions
8. Percent of government institutions with organizational emails
9. Total expenditure on ICT of government institutions
10. Percent of ICT budget spent on institutional capacity-building and human resource development

ICT usage indicators

1. Percent of open source software vis-à-vis proprietary
2. Percent of licensed software vis-à-vis cracked ones
3. Percent of government institutions who have institutional email system.
4. Percent and type of applications used, e.g. word processing, accounting, data base, website
5. Percent of staff in government institutions who are trained on use of ICTs
6. Percent of professional ICT staff who execute and maintain technical ICT issues

2.2. Implementation

The college of Computing and IT at UOH was awarded the contract to conduct the survey. The ministry of communication and technology led by the minister directed and guided the implementation process. A detailed process was designed and monitored to ensure successful implementation of this survey. The questionnaire was developed in consultation with officials of the ministry and subsequently finalized

after lengthy deliberations. Enumerators were trained on the objectives and the relevance of the questions and in order to test the questionnaire. Finally revisions were made prior to delivering the final questionnaires to the selected institutions.

The questionnaires were hand delivered by enumerators. Completed questionnaires were quality checked and entered into SPSS software and MS excel database for analysis.

A total of 10 enumerators assisted all the respondents complete and also validate the filled questionnaires. In some cases a follow up short interview was scheduled for the enumerators to clarify some issues.

2.3. Anticipated Survey Challenges

- Getting all the target respondents to cooperate and participate objectively could be a challenge and lead to incomplete or unavailable data.
- Communication/Technical Language barriers in some areas would make administering the questionnaires difficult.
- Some institutions regard the data requested as sensitive and confidential
- Honoring of appointments by the respondents.
- Some questions may not be easily understood by the respondents.
- Some respondents may provide incorrect data for the sake of completing the survey.

- Fear by some respondents and their institutions that MoCT may want the survey data for the purpose of taking over their jobs/roles or Information Technology budget allocation. A perception of conflict of roles or interest.

2.4. Mitigating Measures to address the challenges during the Survey

- Use of introductory badges and letters from MoCT, and the intervention of MoCT officials.
- Advance sensitization of respondents and the public.
    - A notice letter has been sent to respondents ahead of time that provided them with information on the study the purpose of the survey including the timetable the enumerators will visit them.
    - When necessary MoCT officials has been calling respondents to provide a brief of what the survey is about and outline the benefits of participation.
- Train enumerators on how to handle communication barriers and how to validate the questionnaires.
- Help respondents to fill the questionnaire to avoid misunderstandings and assumptions.
- A communication channel (slack.com) has been established that served as a hotline to get support from supervisors and project coordinators.

2.5. Survey Timeline

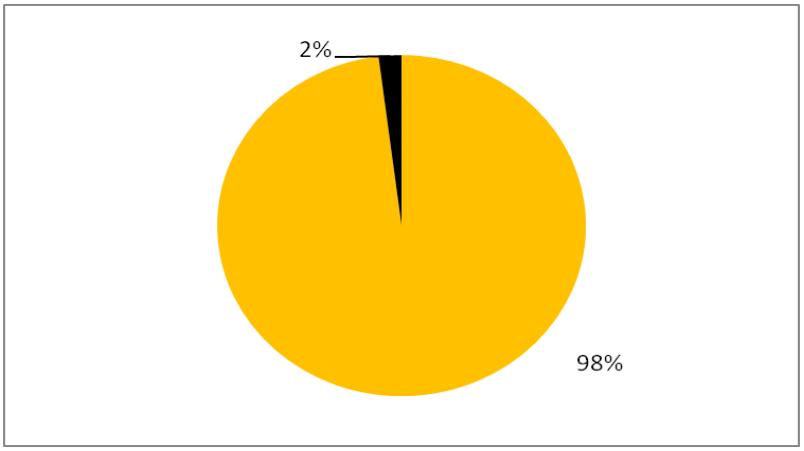
This survey was conducted between 29th August and 13th September 2018.

3. Survey Findings

3.1. Completion Status

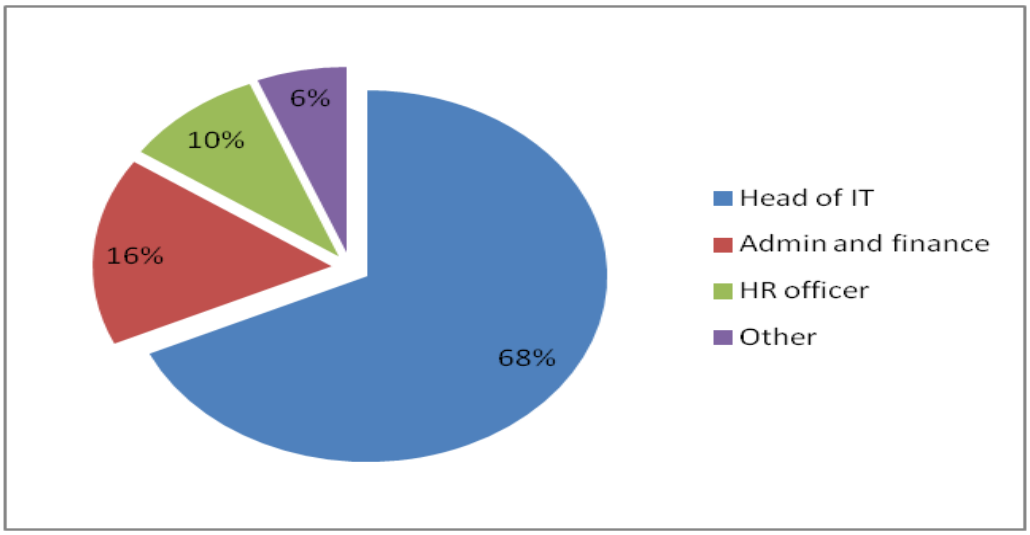
Questionnaires:	Number of questionnaires	Percentage
Targeted	**44**	**100%**
Completed	**43**	**98%**
Not completed	**1**	**2%**

Figure 3.1: Overall completion status



3.2. Statistics of Respondents per Job title

Figure 3.2: Respondents per job title

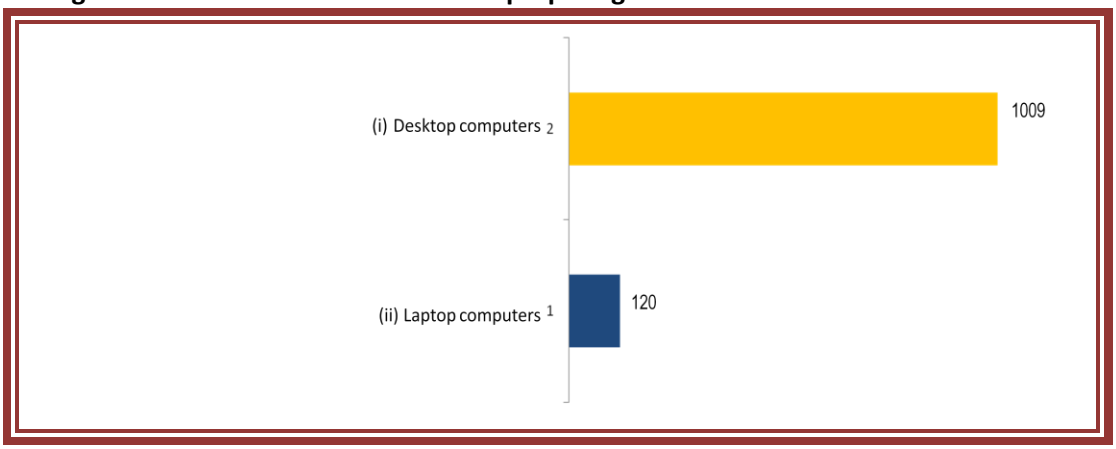


Source: Table A2 1

3.3. Percentage of government institutions with computers (Desktop/Laptop)

All the 43 government institutions that responded have desktop computers totaling to 1009; while 26 or 60% of government institutions have laptops totaling to 120.

Figure 3.3: Total number of PC and Laptops in government institutions



Source: Table A2 2

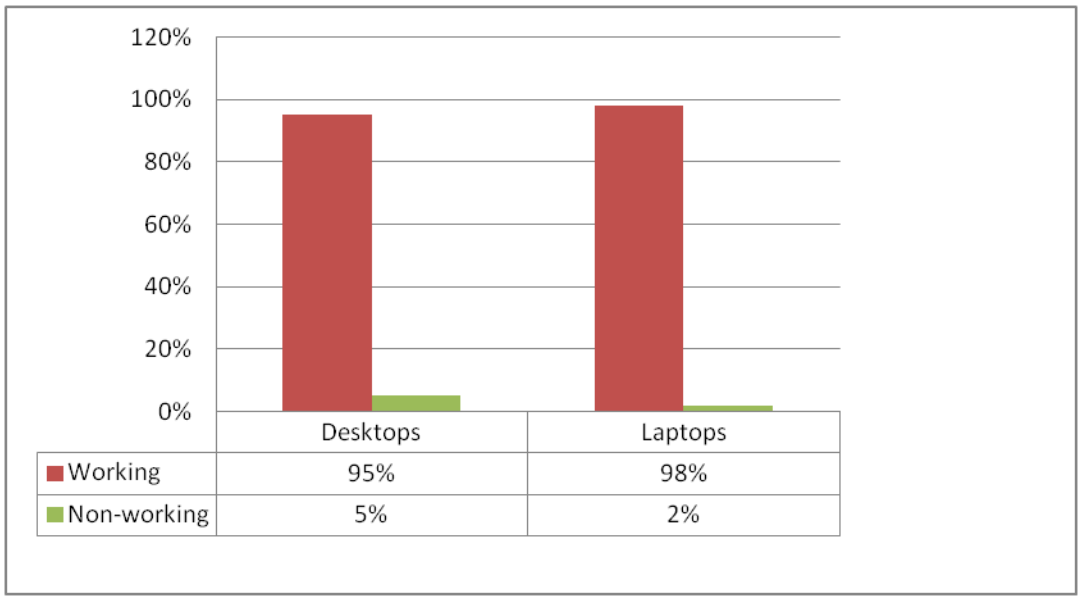
3.4. Number of working computers on government institutions

The Survey indicated a total of 1009 desktop computers among all 43 government institutions; 95% are working and have been assigned to staff. Only 5% are not working.

60% of government institutions have laptops totaling to 120; of the 120 laptop computers 98.33% are working and assigned.

With the rise of portable computing devices and wireless technology the government will need to formulate policies around the mix of desktop and portable computing devices in consideration of the new emerging culture of a mobile work force.

Figure 3.4: Number of working PCs/Laptops in government institutions

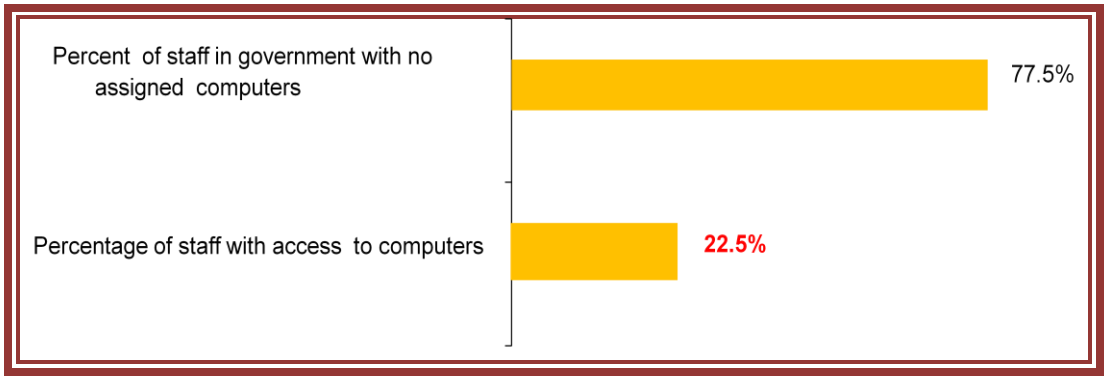


Source: Table A2 3

3.5. Staff access to computers in Government institutions

According to the survey 22.5% of staff in government institutions has a computer assigned. This means 22 out of every 100 can be assigned to a computer.

Figure 3.5: Staff access to computers proportion

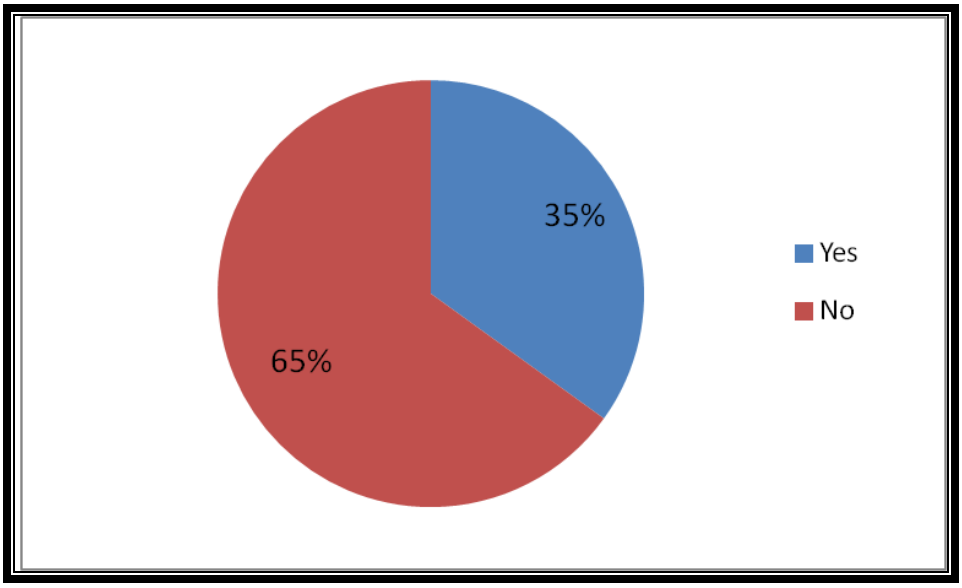


Source: Table A2 4

3.6. Availability and usage of fixed telephone lines in Government Institutions

Across the all government institutions there are a total of 83 fixed line telephone connections. While only 10 or 11.6% of Government Institutions have a business telephone systems (PABX).

Figure 3.6: Availability and usage of fixed telephone lines



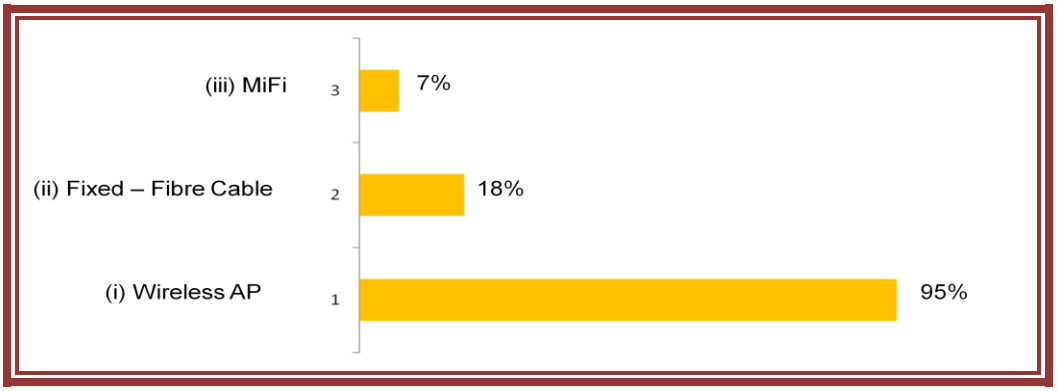
Source: Table A2 5

3.7. Type of internet connectivity

According to the survey 98% of all government institutions have internet access.

Several government institutions have more than one way of connecting to the internet; however, the majority of institutions; 95% are connected via wireless AP. 18% of institutions are connected via Fixed Fibre-Optic cable.

Figure 3.7: Proportion of government institutions with access to the Internet by type of access



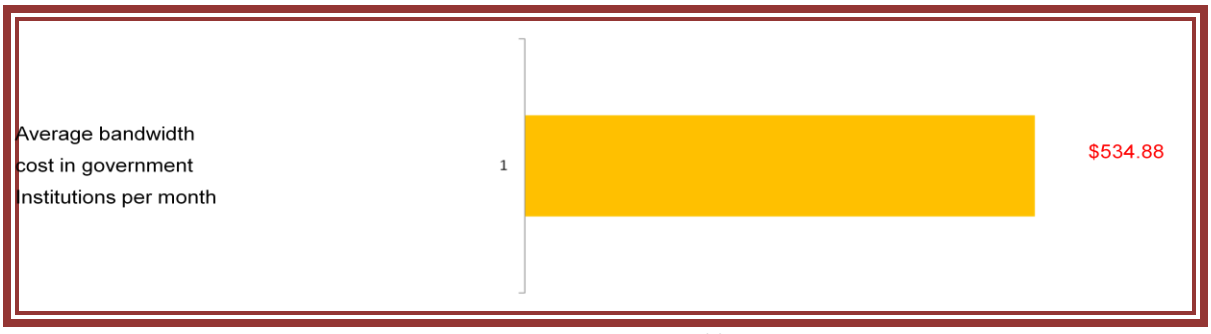
Source: Table A2 6

3.8. Total costs of internet in government institutions (Dollars) per year

The total cost of internet usage across the 43 government institutions is $23000 per month and $276000 per year. While the usage costs of direct telephone lines is around $300 per month as indicated by the survey.

The adoption of a centrally managed internet service for the entire Government can significantly reduce the total cost for the government.

Figure 3.8: Total cost of internet usage per month

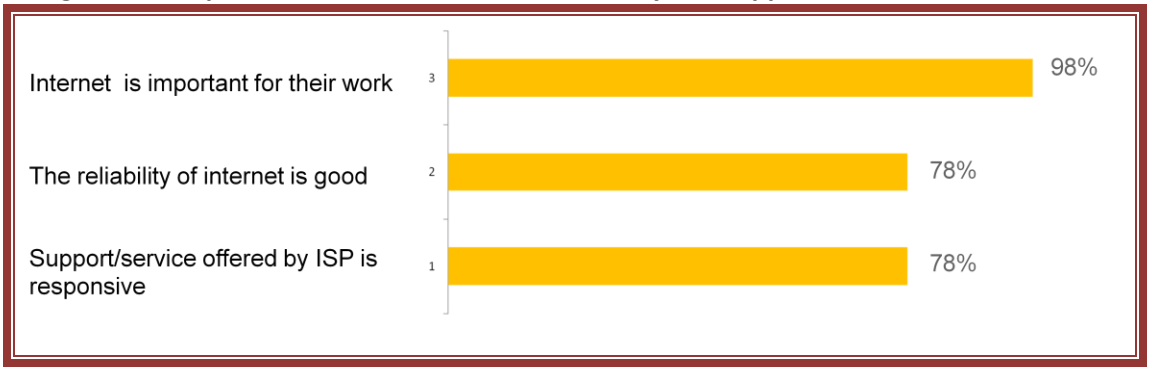


Source: Table A2 7

3.9. Importance of internet service, reliability and support offered in government

As shown by the below chart 98% of government institutions responded that the internet is important for their work. 78% of government institutions have reported that their internet connection reliability is good; while 78% reported the support/service they are offered is responsive.

Figure 3.9: Importance of internet access, reliability and support offered

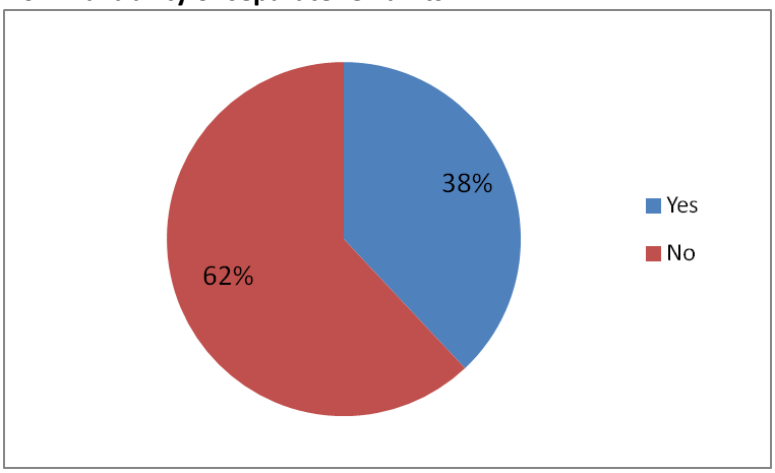


Source: Table A2 8

3.10. Availability of separate ICT units in Government

Figure 3.10 shows that only 38% of government institutions have a separate ICT unit within the institution. 62% of all government institutions DO NOT have such facility.

Figure 3.10: **Availability of separate ICT units**

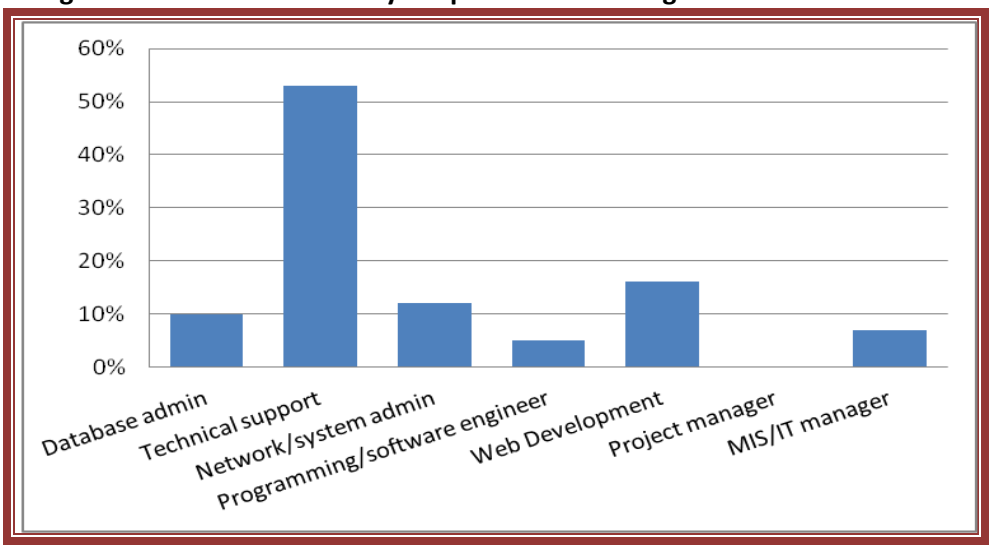


Source: Table A2 9

3.11. Proportion of ICT personnel areas of work in government institutions

ICT personnel in Government institutions according as shown in figure 3.11 are mostly involved in providing technical support (54%) and database maintenance and development (12.8%). Other areas of work include network administration (12%), MIS and IT Management (7%), web development (16%), project management (0%).

Figure 3.11: Areas of Work by ICT personnel within government



Source: A2 10

3.12. Availability and usage of network systems

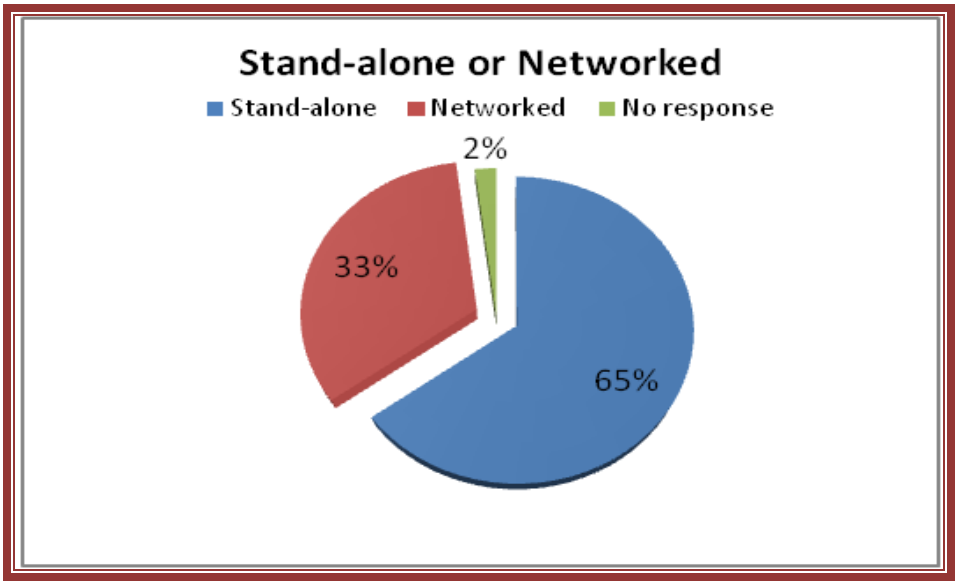
33% of the 43 government institutions that responded have computer network system of which;

- 31% have local area networks (LAN).
- 2% are connected to shared Private network system (Intranet)

65% of government institutions maintain their computers as stand-alone basis.

There is No Government Network available in which institutions can connect.

Figure 3.12: Availability of computer network systems



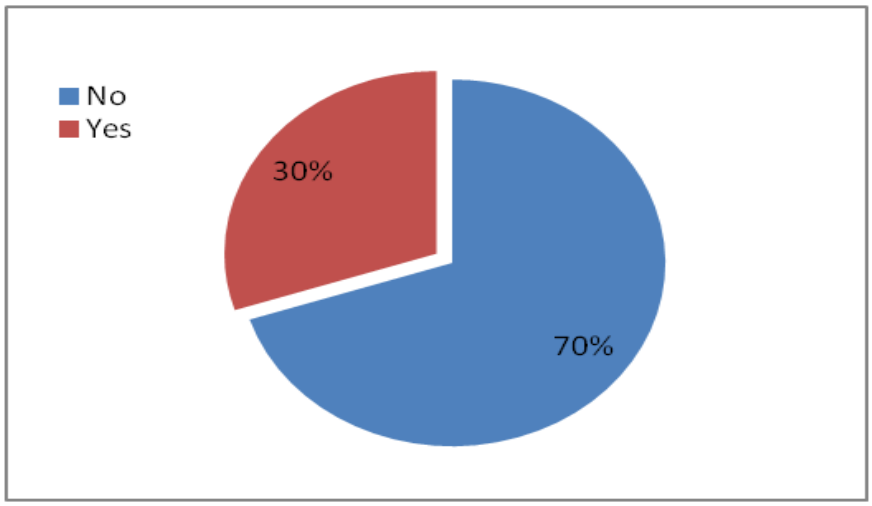
Source: Table A2 11

There is need for creation of a Government Network in which all institutions are connected.

3.13. Availability and usage of electronic surveillance cameras in Government

Figure 3.13 shows 30% of all government institutions surveyed have installed electronic surveillance cameras.

Figure 3.13: Availability of surveillance cameras



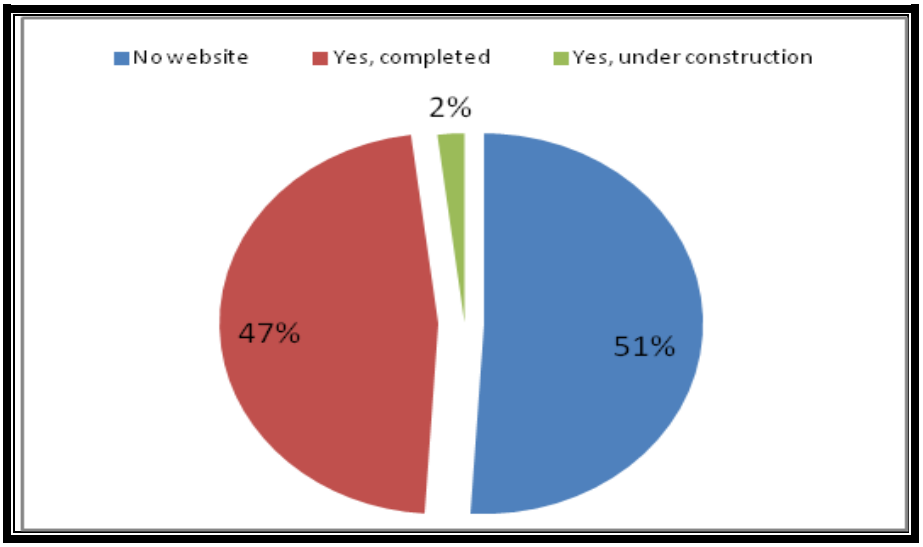
Source: A2 12

3.14. Proportion of government institutions with websites

Nowadays website is the most common medium through which information about an institution can be accessed by the general public via the Internet. Availability of websites improves accessibility to information. According to the survey 51% of government institutions DO NOT have websites. Therefore access to information regarding the mandate and services provided by each of these institutions is not publicly available. Only 47% of government institutions have complete website and further 2% under construction.

This statistics shows a need for the **creation of a single government information portal** allowing for links to all government institutions to be hosted on the portal, so that businesses and citizens can access all government sites via one portal.

Figure 3.14: Availability of Government websites

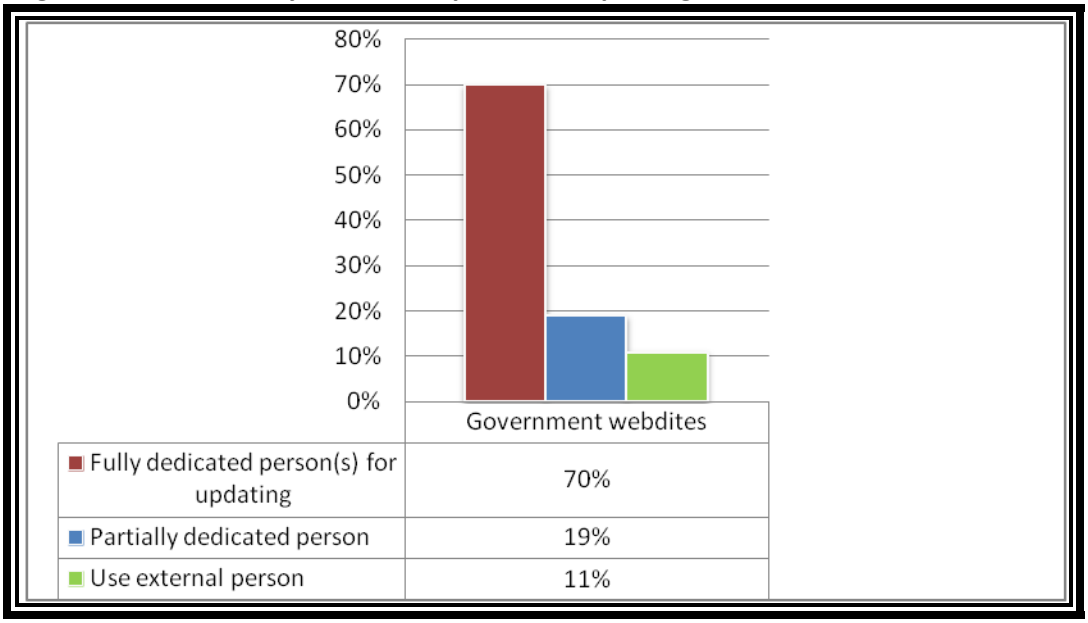


Source: Table A2 13

3.15. Percent of institutions have resources for updating their website who are:

Further analysis indicates as shown in figure 3.15 among the 49% government institutions that have website 70% have a fully dedicated person(s) for updating their websites, meaning that there are chances of 30% of the websites having static data for a period of time.

Figure 3.15: Availability of resource person for updating website

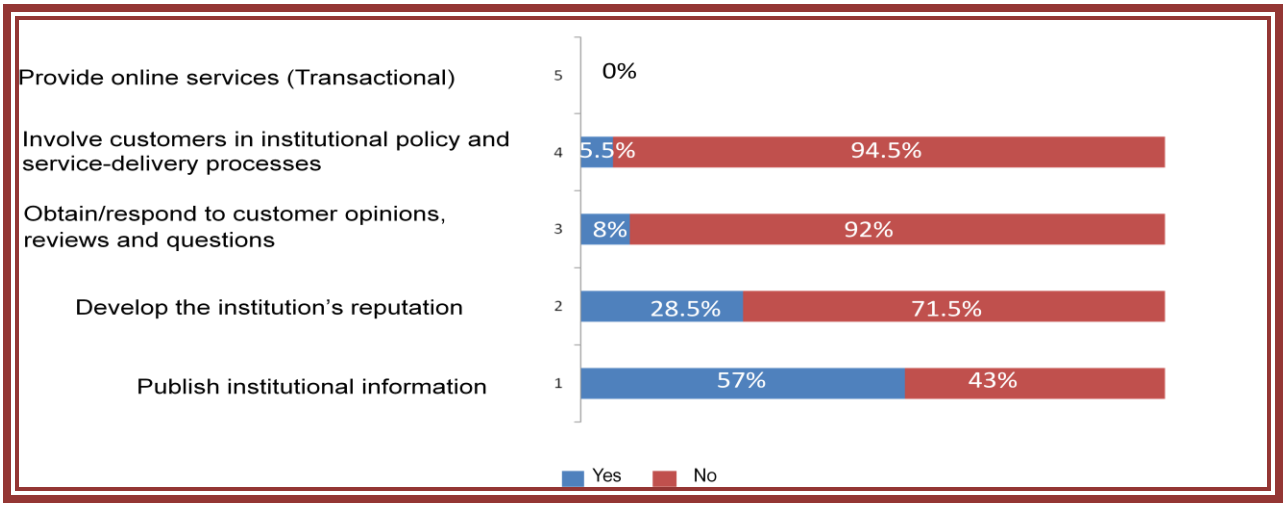


Source: Table A2 14

3.16. Purpose of having website

On the question the purpose of having website figure 3.16 shows that of the 43 institutions that responded only 47% have a website which is very low statistics. The majority of them use to publish institutional information.

Figure 3.16: **Usage of institutional websites**

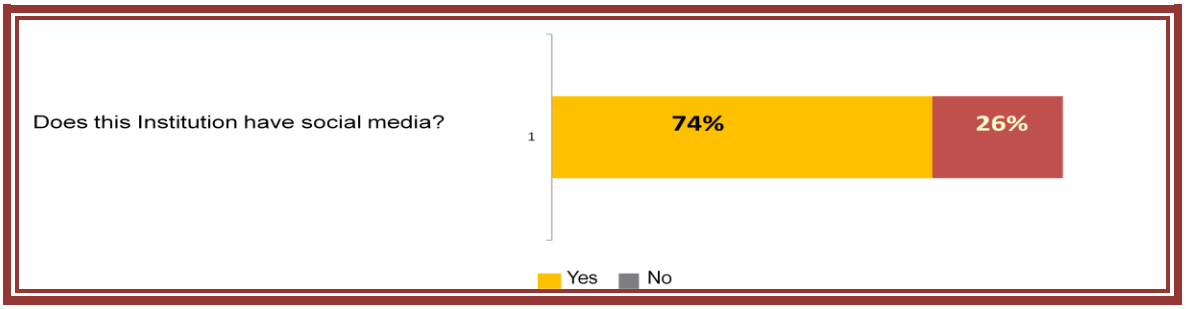


Source: Table A2 15

3.17. Proportion of institutions with social media presence

74% of government institutions reported that they have social media presence. The majority of respondents indicated the use of Face book to publish information.

Figure 3.17: Social media presence



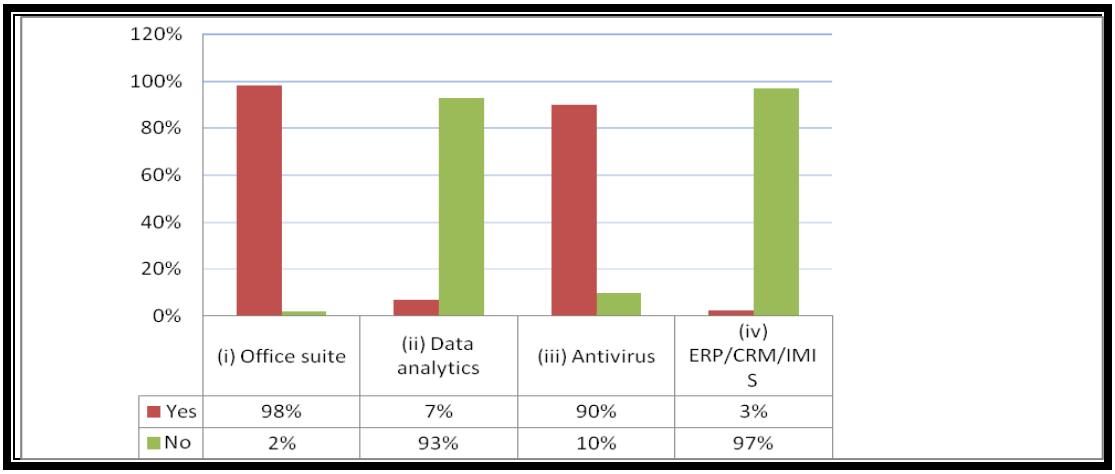
Source: Table A2 16

3.18. Applications used in government Institutions

All government institutions use office suit applications, with 90% of institutions having antivirus software, and 7% of government institutions having data analytics software.

2.3% of respondents have ERP / CRM / IMIS systems, reflecting a need for opening out in this area to initiate a business processes re-engineering that is prerequisite to deliver online services to businesses, citizens and other government institutions.

Figure 3.18: Availability of software applications



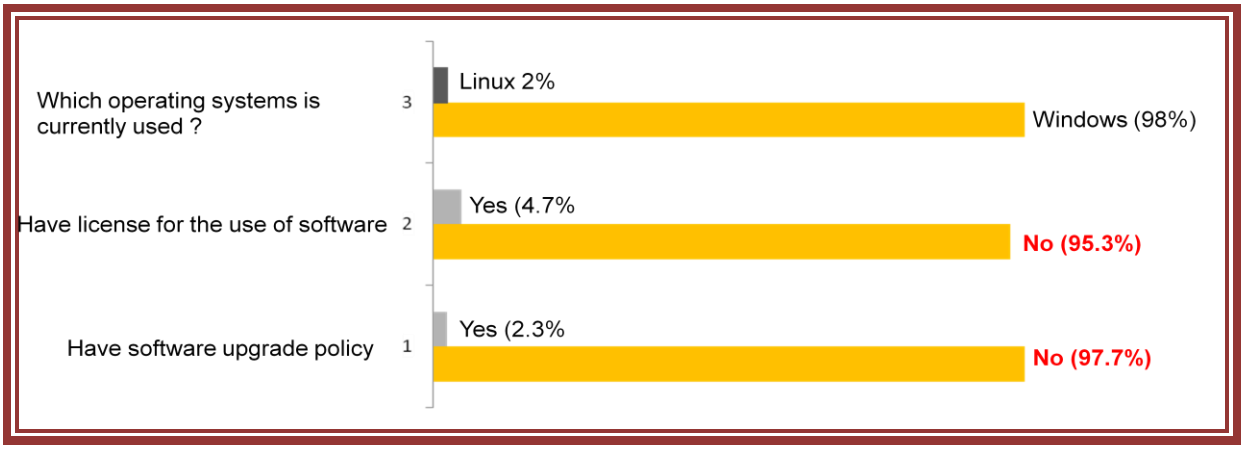
Source: Table A2 17

3.19. Availability and type operating system in use, license for use of software

The data collected shows that Microsoft Windows is used by 98% of institutions with around 5% reported the use of licensed Software.

97.7% reported that they don't have software upgrade policy in place.

Figure 3.19: **Availability of operating systems**

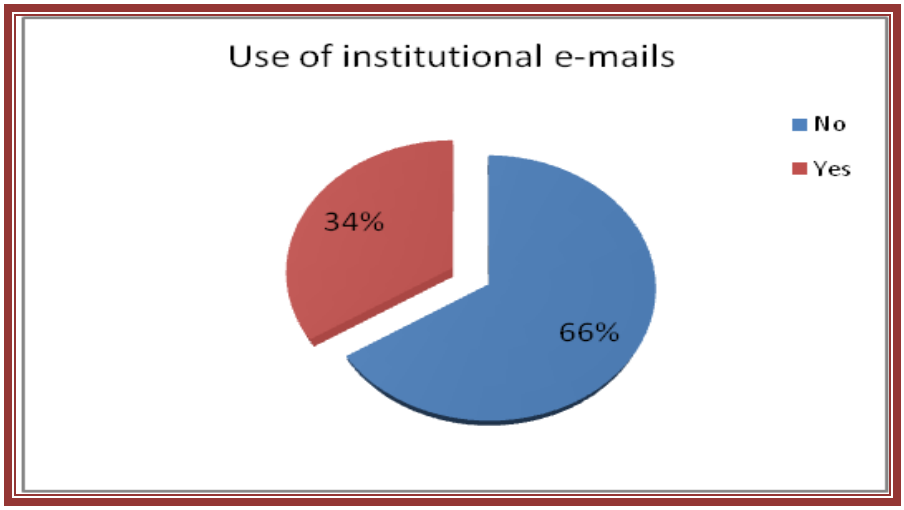


Source: Table A2 18

3.20. Percentage of Government Institutions with institutional email

66% of the respondents have a documented that they don't use institutional email for official communication. This reflects an urgent need to create government email system.

Figure 3.20: **Availability of institutional emails**

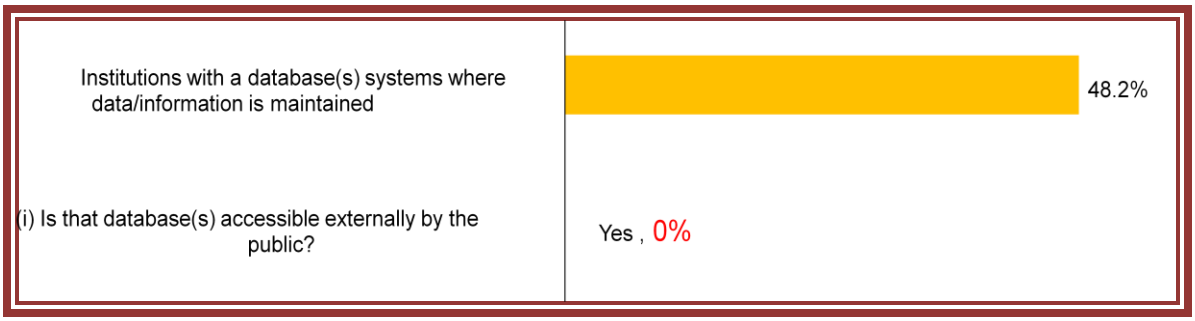


Source: Table A2 19

3.21. Percent of government institutions with databases maintaining public information

48% of central government institutions have databases maintaining data / information but they are not published. This means that the government institutions are not engaged in transacting with the public (No service delivery).

Figure 3.21: **Availability of database systems in Government**

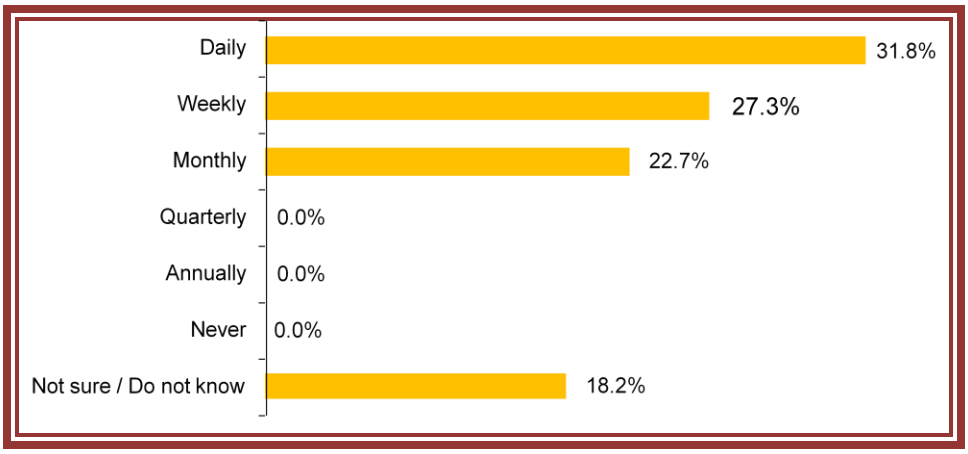


Source: Table A2 20

3.22. Frequency of update of government institutions websites

Approximately 13 or 32.6% of websites are updated every month; note that the survey indicated only 49% of government institution have website.

Figure 3.22: **frequency of updates**



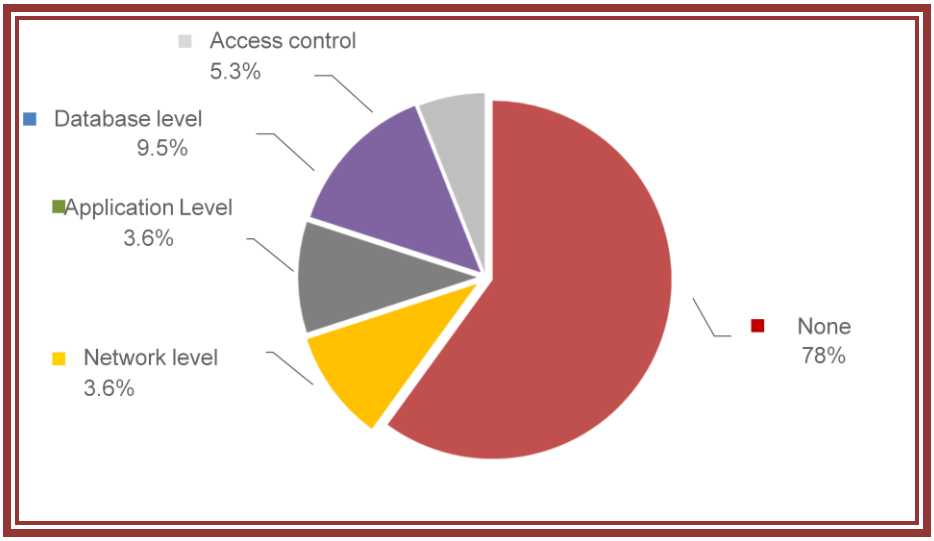
Source: A2 21

3.23. Percentage of government institutions' computer systems that are protected by type of protection

The study found that 78% of the government institutions' computers systems are not protected by any type protection mechanism or systems.

This is an alarming statistic, lack of the basic security for government data on computers being provided for by all respondents.

Figure 3.23: Availability of protection or security systems

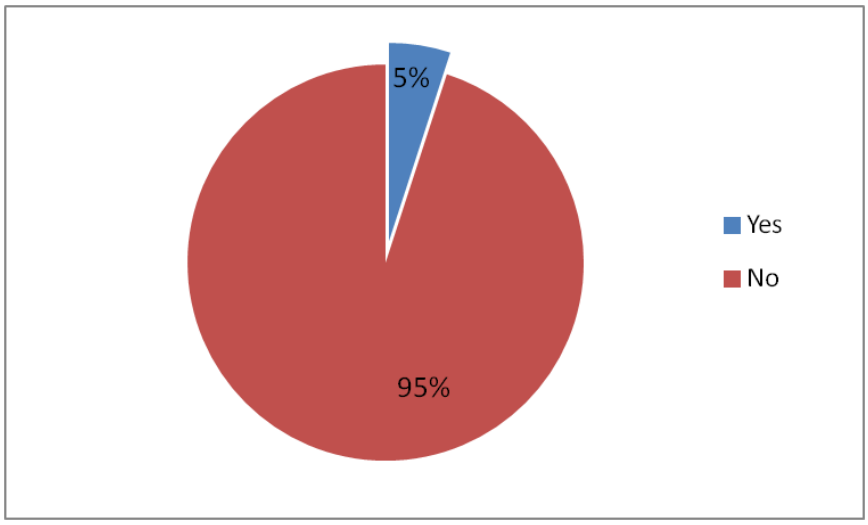


Source: Table A2 22

3.24. Percent of government institutions with separate annual IT budget

Majority of government institutions 95% indicated that there is NO separate annual IT budget to support IT activities in their institutions. Only 5% indicated they have ICT budget.

Figure 3.24: **Availability of separate annual ICT budget allocation**

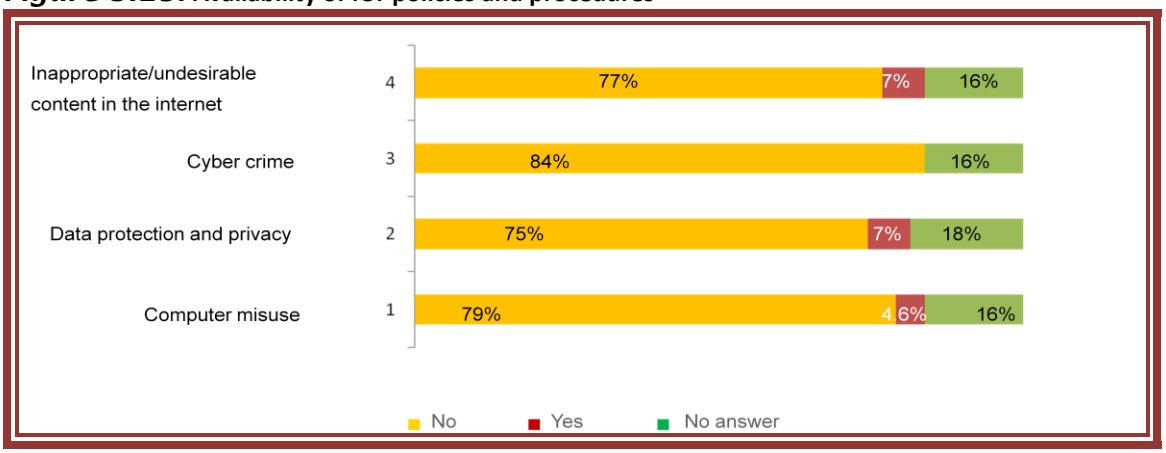


Source: Table A2 23

3.25. Percentage of government institutions with IT policies and procedures

Among the government organizations surveyed, only 7% indicated they have policy on inappropriate/undesirable content

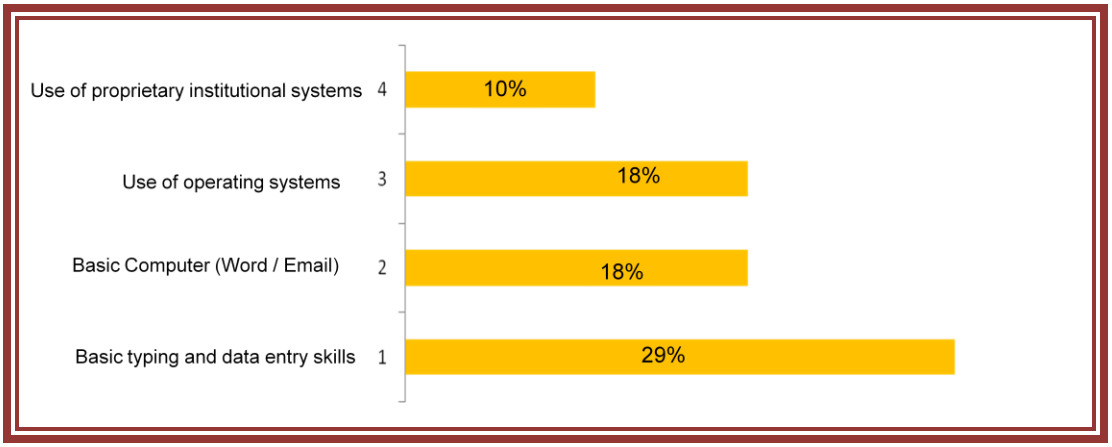
Figure 3.25: **Availability of ICT policies and procedures**



Source: Table A2 24

3.26. Percent of government Institutions that offer training in the use of ICT software

Figure 3.26: **proportion of government institutions that offer ICT training by type training**



Source: Table A2 25

Implementation status of major Government ICT projects

For the purpose of this study the level of implementation and operation of ICT systems in selected public sector institutions has been first collected through the government ICT usage questionnaire. Initially, the data collected with regard to the implementation status of these systems has been reviewed. However, the information available was not sufficient for the study purpose and therefore, a follow-up sub-study was carried out by the ministry of Communication and Technology in order to assess the extent of implementation, strategic objectives and the status of these systems. Furthermore the constraints and problems encountered in the introduction of these ICT systems are also briefly reviewed.

The sub-study indicated that in all government institutions that were assessed by the sub-study revealed that they have no clear strategic objectives (i.e. automate information handling, improve efficiency, reduce operational costs etc) towards the introduction of their ICT facilities. As a result the benefits associated with the introduction of such systems can't be measured.

Most of the government ICT systems were initiated through external partnerships therefore ownership of such systems cannot be determined as such.

Data regarding estimated cost and budget for all ICT system currently in operation was not available and can be considered limitation for this study.

According to the study all the ICT systems reviewed do not have Disaster Recovery Plans which highlights the lack of a crucial element in ensuring the continuity of the institution's ICT services in the event of accident.

There was no IT security mechanism in place across all government institutions. As a result all ICT systems reviewed were susceptible to various attacks

Furthermore Government ICT projects do not yield desired fruits due to the following factors:

- Lack of ownership and proper organizational change
- Poor participation of key stakeholders
- Poor coordination during implementation
- Lack of coherent and integrated implementation strategies
- Lack of proper feasibility studies before approval
- Lack of separate ICT budget for ICT related activities

Table A.3 below summarizes the key findings of the sub-study carried out by the Ministry of Communication and Technology.

Table A.3

S.NO	Project	Owner/ Developer	Production status	Budget	IT Security Policy	User Level Security	Service Level Agreement (SLA)	Disaster Recovery Plan
1	CENTRAL BANK (CORE BANKING SYSTEM (CBS))	SAHAL TECH	In production for some functions	Data not available	No	No	None	No disaster recovery plan. No recovery site
2	MINISTRY OF FINANCE (FMIS)	UNKNOWN	Partial production	Data not available	No	No	None	No disaster recovery plan.
3	MINISTRY OF FINANCE (CUSTOMS SYSTEM)	SAHAL TECH	Partial production	Data not available	No	No	None	No disaster recovery plan.
4	MINISTRY OF INTERNAL AFFAIRS (CITIZENS REGISTRATION)	SAHAL TECH	Full production	Data not available	No	No	No	No disaster recovery plan.
5	IMMIGRATION AND CITIZENSHIP (PASSPORT SYSTEM)	SAHAL TECH	Full production	Data not available	No		None	No disaster recovery plan.
6	IMMIGRATION AND CITIZENSHIP (BORDERS SYSTEM)	IOM	Full production	Data not available	No	YES	None	No disaster recovery plan.
7	MINISTRY OF TRANSPORTATION	GTS	In production for some functions	Data not available	Not available	Not available	None	No disaster recovery plan.
8	WATER AGENCY (BILLING SYSTEM)	UNKNOWN	Full production	Data not available	No	No	None	No disaster recovery plan.
9	MINISTRY OF SOCIAL AFFAIRS (ALIEN WORKERS REGISTRATION)	SMARTSOM	In production	Data not available	No	No	None	No disaster

			for some functions					recovery plan.
10	MINISTRY OF SOCIAL AFFAIRS (NATIONAL WORKERS REGISTRATION)	SomTech	In production for some functions	Data not available	No	No	None	No disaster recovery plan.
11	MINISTRY OF EDUCATION (EDUCATION MANAGEMENT SYSTEM)	UNKNOWN	Partial production	Data not available	No	No	None	No disaster recovery plan.
12	MINISTRY OF EDUCATION (EXAM MANAGEMENT SYSTEM)	TRUE SOFT	Partial production	Data not available	No	No	None	No disaster recovery plan.
13	MINISTRY OF CIVIL WORKS AND HOUSING (ASSET REGISTRATION)	SAHAL TECH	Partial production	Data not available	No	No	None	No disaster recovery plan.

4. Conclusion and Recommendations

The following conclusions have been arrived at on the basis of the knowledge and understanding gained during the study.

- Lack of ICT laws, institutional and regulatory frameworks
- Inadequate infrastructure facilities (hardware, software, security)
- Lack of e-Government policy and procedures for ICT usage in government
- Majority of government institutions do not have institutional e-mail for official communication
- The use of standard tools such as word processing, spreadsheets, presentation in day to day work is high
- Lack of skilled ICT personnel
- Lack of training and capacity building on the use ICT for employees
- Availability of internet access is relatively high among all government institutions, however the uses of internet among employees was not clear
- Availability of websites is low. Therefore access to information regarding the mandate and services provided by each of these institutions is not publicly available
- It was found that all the institutions surveyed do not offer online services to the general public
- Insufficient network systems installation for resource sharing
- Lack of information security policy against cyber crimes and ICT related security

On the basis of the knowledge and understanding acquired during the study, the following **recommendations** are made for further improving the ICT usage in the public sector and to ensure success for on-going and future ICT projects implementation

1. The ministry of communication and Technology should develop Policy and Procedures for ICT Usage in Government (e-Government Policy)
2. The first and the foremost area that should be addressed by the government is the development of various regulatory frameworks for ICT from data usage, protection and privacy to national e-Government policy. In almost all institutions there are no even ICT procedures to follow let alone policies.
3. Establish separate ICT Units in government organizations where such units do not exist yet.
4. Establish Central ICT support unit under the ministry of Communication and Technology, comprising among others security specialists who are proficient in ICT, to provide technical advice and support (e.g. hardware, software, networking , communications and security) to government institutions, as required.
5. Guarantee government officials use organizational emails for issues related to their work and for this to happen the ministry should provide e-mail accounts to all government officials through the governmental portal.
6. There is high shortage of skilled ICT manpower in the government institutions and this issue needs to be addressed by systematically

7. Train the government employees for the use of ICT in a coordinated and continuous manner. These trainings can be organized and coordinated periodically by the MoCT.
8. ICT budget should be included in national budget allocation with a realistic annual action plan that contributes to the ICT policy of the government.
9. There is a mismatch between the cost of internet incurred and the actual bandwidth utilized. On the other hand the total cost associated with internet connection and bandwidth is quite high. The government should consider setting up a **Government Network** (WAN) to provide connectivity and internet services to all the government institutions
10. Create or setup a **single government information web portal** (i.e. *sl-gov.org*), allowing for links to all government institutions to be hosted on the portal, so that businesses and citizens can access all government sites via one portal.
11. Guarantee government institutions to have websites and frequently update their websites as well as security software
12. Ensure that government information and services are delivered using all possible channels of service delivery, and should also extend towards delivery of services through mobile devices.
13. Provision of computers in public institutions in order to increase percent of employees who have access to computers at work. This percentage can be significantly increased by the Introduction of shared computer rooms.

14. Develop IS projects development lifecycle frameworks. In this regard the ministry of CT should be consulted before embarking on any major ICT project.
15. National or government data centers need to be established and utilized to significantly boost data security, availability, and traceability and
16. Each government institution should urgently formulate a comprehensive Disaster Recovery Plan (which specify, among other matters, relevant Disaster Recovery Sites)
17. Ensure to keep in place a IT security officer in all government institutions maintaining IS systems who should be responsible for implementation of relevant procedures including those in the Disaster Recovery Plan.

1. Appendices

A.1 List of study Indicators & Findings

Indicators	Estimates of the Indicators -
Overall targeted institutions per category Completed = 43 *[98%]* Did Not Respond = 1 *[2%]*	▶ Ministries = 22 ▶ Government Agencies (GAs) = 14 ▶ Commissions = 6 ▶ The Presidency = 1 ▶ Total Targeted = 44 Respondents
Statistics of Respondents per Job title	▸ Head of IT, 67.4% ▸ Admin and Finance, 16.2% ▸ Head of Human Resources, 9.3% ▸ Others, 6.9%
Percentage of government institutions with computers (Desktop/Laptop)	▸ All the 43 government institutions that responded have desktop computers totalling to 1009; while 26 or 60% of government institutions have laptops totalling to 120.

Percentage of working computers vs. non working	• Of the total 1009 desktop computers within these institutions; 95% are working; and 5% are non working. • Of the total 120 laptops 98.33% are working.
Staff access to computers in Government	• 22.5% of staff in government institutions has a computer assigned. This means 22 out of every 100 can be assigned to a computer.
Percent of Government Institutions with fixed telephone lines	• Across the all government institutions there are a total of 83 fixed line telephone connections. • Only 10 or 11.6% of Government Institutions have a business telephone systems (PABX).
Total costs of internet and telephone lines in government institutions (Dollars) per year	• The total cost of internet usage across the 43 government institutions is $23000 per month and $276000 per year. While the usage costs of direct telephone lines is around $300 per month. as indicated by the survey.
Percent of government institutions with websites	• 49% of government institutions have static websites.

	▸ 51% of government institutions have NO website.
Objectives of having website	▸ The majority of them 57% use to publish institutional information.
Percent of institutions with social media presence	▸ 74% of government institutions reported that they have social media presence. The majority of respondents indicated the use of Face book to publish information.
Importance of internet service, reliability and support offered in government institutions	▸ 98% of government institutions responded that the internet is important for their work. ▸ 78% of government institutions have reported that their internet connection reliability is good, while 78% reported the support/service they are offered is responsive.
Percent of government institutions with access to the Internet by type of access	▸ 98% of all government institutions have internet access. ▸ Several government institutions have more than one way of connecting to the internet; however, the majority of institutions; 95% are connected via wireless AP .

	▸ 18% of institutions are connected via Fixed – Fibre cable,
Government institutions with corporate networks (LAN, intranet, extranet)	▸ Of the 43 government institutions that responded ONLY 14 or 33% have computer network systems (LAN).
Applications used in government Institutions	▸ 100% of respondents have office suit applications, with 100% having antivirus software, and 11% having data analytics software. ▸ 2.3% of respondents have ERP / CRM / IMIS systems.
Percent Type operating system in use, license for use of software and upgrade policy in public sector	▸ Microsoft Windows is used by 98% of respondents with 95% reported the use of unlicensed Software. ▸ 97.7% reported that they don't have software upgrade policy in place.
Percentage of Government Institutions with institutional email	▸ 66% of the respondents have a documented that they don't use institutional email.

Percent of government institutions with databases maintaining public information	▸ 48% of central government institutions have databases maintaining data / information but they are not published.
Percent of institutions have resources for updating their website who are:	▸ Of the 21 government institutions who have website 70% have a fully dedicated person(s) for updating their websites.
Average frequency of government institutions updating their websites	▸ Approximately 13 or 32.6% of websites are updated every month.
Percentage of government institutions' computer systems that are protected by type of protection	▸ 78% of the government institutions' computers systems are not protected by any type protection mechanism or systems.
Percent of government institutions with separate ICT units	▸ 38% of government institutions has separate ICT unit within.
Percent of government institutions with ICT budget	▸ 5% of government institutions indicated that there is ICT budget to support ICT activities in their institutions.
Percent of expenditure on ICT per total expenditures	▸ Data not available

Percentage of government institutions with IT policies and procedures	▸ 6.2% is the average of institutions with a kind of policy which is inconsiderable
ICT staff in government institutions	▸ of the 43 government institutions there are 109 ICT personnel. On average there are 2 ICT personnel in each institution.
Percent of government Institution that offer training in the use of ICT software	▸ Of all 29% of the institutions provide data entry training for their employees, no critical trainings like data protection and security was mentioned by any institutions.
Future IT plans	▸ All the institutions surveyed DO NOT have ICT plans for the future.

A.1 Tables

Questionnaire

MINISTRY OF COMMUNICATIONS AND TECHNOLOGY

Data Collection/ Survey on Government ICT Indicators

Questionnaire on ICT usage in Government Sector

Date: (DD/MM/YY) …….. Batch No. …….

The purpose of administering this questionnaire is to ascertain the current status of utilization of ICTs in Government and assess technical and professional gaps, so as to come up with future plans for ICT function/services; for strategic planning at a national level.

A. RESPONDENT'S DETAILS

Name of respondent	……
Sex of respondent	[0] Male [1] Female
Job Title	……
Email address	
Telephone contact	

B. ORGANISATION'S DETAILS

1. Type of institution (tick as appropriate)	**i.** Ministry **ii.** Govt. Agency **ii.** Commission **iv.** Other, please specify ……..
2. Name of Institution	….……
1. Location:	……
2. Number of employees	……
3. Employees by gender:	Male(s) ……..… Female(s)……

C. ICT INFRASTRUCTURE, USE OF INTERNET AND ACCESSIBILITY

4. How many computers do you have in this Institution?	Desktops…….. Laptops …….. Total ……	
5. What is the functionality status of these computers?	Desktops: Functional (Number) …… Non-Functional (Number) …… Laptops: Functional(Number) …… Non-Functional (Number) …….	
6. Does your institution have a working Fixed-line telephone connection	[0] No [1] Yes	
7. How many working Fixed-line telephone connections does your institution have?	Number …… Cost(monthly)	
8. Does your Institution have a Private Automatic Branch eXchange (PABX)?	[0] No [1] Yes	
9. Does it support VoIP?	[0] No [1] Yes	
10. Does this Institution have internet access?	[0] No [1] Yes	
11. Who is your Internet Service Provider?	1.	

	2. ..... 3.	
12. If Yes to Qn 10what type? ***(Tick all that apply)***	[1] Wireless [2] Fixed (fibre cable) [3] MiFi [4] Others (specify)……..	
13. How much internet bandwidth does this Institution use (if applicable)?	Bandwidth……..….(Mbps)Cost..... (per/m) Bandwidth……..….(Mbps)Cost..... (per/m) Bandwidth……..….(Mbps)Cost..... (per/m)	
14. Does your institution restrict access to particular URLs/sites/applications?	[0] No [1] Yes	
15. How important is the use of the Internet for your institutional (work) activities?	[1] Very important [2] Important [3] Moderately Important [4] Slightly Important [5] Not important	

16. The reliability of the Internet connection at your institution	1] Very good [2] good [3] Not sure [4] poor [5] Very poor	
17. The customer support/service offered to your institution when you report faults	[1] Very responsive [2] Responsive [3] Not sure [4] Unresponsive [5] Very unresponsive	
18. Does the Institution have a website (functional)?	[0] No [1] Yes, website url ……	
19. What Content Management System (CMS) powers your institutional website?	[1] Drupal [2] Joomla [3] WordPress [4] SharePoint	

	[5] Plone [99] Other (Please Specify)	
20. Is the website regularly updated?	[1] Daily or almost everyday [2] At least once a week [3] At least once a month [4] At least once every 3 months [5] At least once every year [88]Not sure / don't know	
21. What type of person/resource maintains the institutional website?	[1] Use external agency or third party [2] Have at least one fully dedicated employee [3] Use partially dedicated employee	
22. Does your Institution use institutional email?	[0] No [1] Yes	
23. Does the Institution have active social media presence (Facebook, Twitter, LinkedIn, Pinterest, Google+ etc.)?	[0] No [1] Yes,please specify .(a)..... .(b).....	
24. What is the institutional objective(s) of having a website?	1. Publish institutional information 2. Develop the institution's reputation	

	3. Obtain/respond to customer opinions, reviews and questions 4. Involve customers in institutional policy and service-delivery processes 5. Exchange opinions/knowledge within the institution 6. Provide online services (Transactional) 7. Other, please specify:	
25. Does this Institution have a Local Area Network (LAN)?	[0] No [1] Yes Functional/non	
26. Does this Institution have an intranet?	[0] No [1] Yes	
27. Does this institution have an in-house ICT support team/Help desk?	[0] No [1] Yes	
28. Does your institution have an electronic surveillance system in place?	[0] No [1] Yes	
29. How many offices/branch locations does your Institution have?	Number:	
30. Are these offices/branch locations interconnected to the Head	[0] No	

office/quarters?	[1] Yes	

D. SOFTWARE APPLICATIONS AND INFORMATION SYSTEMS

31. Which of the following types of software applications are used within your Institution?	1. Office suite (word, spreadsheet, presentation) 2. Anti-virus software 3. Email server software 4. ERP software 5. Data Analytics 6. Other, please specify:
32. Which of the following operating systems does your institution currently use?	1. Microsoft Windows. Version ..... 2. Mac OS X. Distribution ..... 3. Linux 4. other, please specify
33. Does your institution have license for the use of software?	[0] No [1] Yes
34. Does your Institution have a software upgrade strategy, policy or guideline governing how software upgrades are	[0] No [1] Yes

performed?		
35. Which of the following applications and database systems are used in this institution?	Front-office	Back-office/ERP
	[0] No [1] Yes, please specify.....	1. HR and Payroll 2. Financial Management 3. CRM 4. Records Management 5. Asset Management 6. Inventory Management 7. Budget Management 8. Purchasing/Procurement
36. If yes to Q40 How much your IT systems cost?	.....	
37. What are the source of funding for the applications and database systems?	1. Government funds 2. Donor funds 3. Other	
38. Where are your institutional applications and databases currently hosted?	1. On-premise physical infrastructure	

	2. Government Data Centre 3. Cloud service providers 4. Other, specify	
39.		
40. Which development platforms are used to develop your institutional applications	.....	
41. Which DBMS is used	1. SQL Server 2. MS Access 3. Oracle 4. MySQL 5. PostgreSQL 6. Other	
42. Which of these ICT security mechanisms have you implemented in your institution?	1. Data protection 2. Protection of software applications 3. Safety of data transfer over the network 4. Access privileges 5. Safety of transactions performed through your website	

	6. others

E. LEGAL AND REGULATORY FRAMEWORKS

43. Do you know of any institutional Policies/Laws regulating the use of ICTs in your institution?	[0] No [1] Yes
44. If Yes, Please state any laws that you are aware of	[1] ..... [2] ..... [3] ..... [4] .....
45. Does your institution have any formal policies and procedures addressing any of the following area(s)?	a. Computer misuse b.Data protection and privacy c. Cybercrimes d. inappropriate/undesirable content on the internet e. Other, please specify .....

F. ICT BUDGET AND EXPENDITURE

46. Is there ICT budget allocated for ICT activities in your institution?	[0] No [1] Yes
47. What was the total budget allocated for ICT activities for last Fiscal Year?	.....
48. Was this allocation enough to support the ICT activities	[0] No [1] Yes
49. How much was released for ICT related activities?	……..……
50. How much was allocated for ICT training last Fiscal Year?	……..…….
51. How much was actually released for ICT training last Fiscal Year?	……
52. What are the main sources for funding ICT activities?	
53. Is there an IT policy in place?	[0] No

	[1] Yes
54. Is there a procurement policy in place for acquiring ICT products and services?	[0] No [1] Yes

G. ICT WORKFORCE AND ORGANISATION

55. How many ICT personnel are employed in this Institution?	Number …….	
56. How many ICT personnel are in the following categories?	a) Computer/technical support (help desk) Number: …….. b) Software engineers/developers or computer programmers Number:…… c) Web developers Number: …….. d) Database administrators Number: ..... e) Network/computer system administrators Number: ..... f) IT security specialist Number:..... g) IT project managers Number: ..... h) MIS/IT Manager Number:..... i) Other please specify:..... Number:.....	
57. Does your Institution have a separate ICT unit that helps address any ICT issues?	[0] No [1] Yes	

58. What level is this unit within the structure of the Institution?	[1] Directorate [2] Division [3] Department [4] Unit [5] Other, Please specify	
59. Does your Institution offer internal ICT training programs to employees in the use of different applications?	[0] No [1] Yes	
60. What types of ICT training programs does your institution offer to employees?	a. Basic typing and data entry skills b Use of operating systems c Use of office productivity suites (e.g. Word, Excel and PowerPoint) d Use of proprietary institutional systems e Other, please specify:	
61. How regular are the ICT training programs offered?	[1] Monthly [2] Quarterly [3] Twice a year	

	[4] Annually [5] Every two years [6] Irregular/ad hoc	

H. OTHER

62. What recommendation(s) would you give to the Ministry of CT to improve access and usage of ICTs in the government sector?

……

……

Thank you for your co-operation

8. References

[1.] Alinaghian, R. (2010). Information Communication. (pp. 1673-1678). Malaysia: IEEE Xplore Digital Library.

[2.] Benat Bilbao-Osorio, S. D. (2013). *The Global Information Technology Report: Growth and Jobs in Hyperconnected World.* Australia: World Economic Forum.

[3.] Krull, A. (2003). *ICT Infrastructure and E-readiness Assessment Report: Estonia.* Tallinn, Estonia: PRAX.

[4.] OECD. (2002). *E-Government Project: Key Issues and Findings.* Public Governance and Terretorial Development Directorate.