



Republic of Zambia  
Office of the President  
Electronic Government Division

PUBLIC SERVICE INFORMATION COMMUNICATION  
TECHNOLOGY STANDARDS

# Public Service ICT Human Capital Development

1<sup>st</sup> edition 2019  
© e-Government Division 2019

## FOREWORD

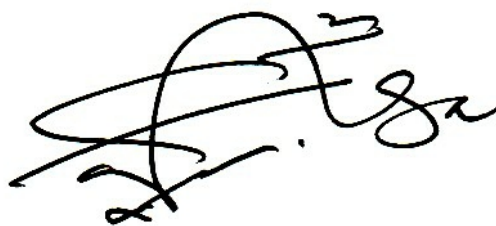
The Electronic Government Division is responsible for formulating and enforcing standards in **Information and Communication Technology (ICT)** across all **Ministries, Provinces and Spending Agencies (MPSAs)** to facilitate the transition into a Digital Society. In view of its mandate, the e- Government Division has developed the Public Service ICT **Human Capital Standard** to provide guidelines when implementing ICTs to guarantee efficiency and cost effectiveness.

The **Human Capital Standard** has been issued to ensure a standardised approach to human capital management across all MPSAs as they implement ICTs. The standard takes into account International Standards, Government and, Stakeholders requirements.

The implementation of the standard will be monitored by the National ICT Standards Review Committee while the e-Government Division will undertake enforcement of this standard. Annual audits shall be carried out in all the MPSAs to determine their compliance to this standard. The Division will issue a certificate of compliance to an MPSA upon completion of a successful audit assessment. For non-compliant MPSAs, a report detailing the extent of the deviation and the prevailing circumstances shall be tabled before the National ICT Standards Review Committee who will advise on the appropriate action to be taken.

The standard will supersede any of the previously approved processes and all MPSAs will be required to be realigned accordingly with effect from the date of issuance.

All MPSAs are required to ensure full compliance to the standard for effective and efficient public service delivery.

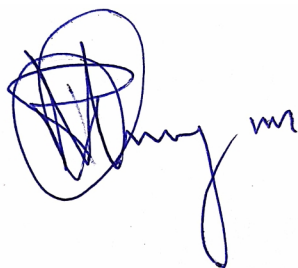


Martine G. Mtonga (Dr.)  
**National Coordinator**  
**SMART ZAMBIA INSTITUTE**

## ACKNOWLEDGEMENT

The development of the Public Service ICT **Human Capital Development Standard** marks an achievement of a key milestone towards cost effective and efficient implementation of ICTs in the Public Service. The standard will assist Government to ensure a coordinated and collaborative approach to implementation of several initiatives under the e-Government programme.

It is for this reason that I wish to commend the e-Government Standards Task Team, Heads of ICT in Ministries, Provinces and other Spending Agencies (MPSAs) and various stakeholders for their unwavering efforts in the development of the Human Capital Development Standard. The document will ensure that ICTs are implemented in an effective and standardised manner.



Percive Chinyama  
**Director Standards**

**SMART ZAMBIA INSTITUTE**

# Table of Contents

FOREWORD .....	iii
ACKNOWLEDGEMENT .....	iv
1.0 INTRODUCTION .....	1
1.1 Objectives .....	1
2.0 SCOPE .....	2
3.0 APPLICATION .....	2
4.0 NORMATIVE REFERENCES.....	2
5.0 BENEFITS OF ICT HUMAN CAPITAL DEVELOPMENT .....	3
6.0 SUB DOMAINS .....	5
7.0 REQUIREMENTS.....	6
7.1 ICT Competency for ICT Professionals in the Public sector .....	7
7.2 Capacity competency for end users and citizens.....	10
7.3 Collaboration with ICT Capacity Training Providers .....	10
7.4 ICT Professionals Certification and Accreditation .....	10
8.0 Annexes.....	12
Annex A: Definitions .....	12
Annex B: ICT Professionals in the Public Sector .....	15
Annex B.1: Job Role: Network Specialist .....	16
Annex B.2: Job Role: Network Administration .....	21
Annex B.3: ICT Professionals in the public sector .....	26
Annex B.4: ICT Service Helpdesk and Incident Management .....	33
Annex B.5: Systems Development and Implementation Domains .....	35
Annex B.6: ICT Systems Architecture, Analysis and Design Domains .....	38
Annex B.7: ICT Project Management Domains .....	41
Annex B.8: Information Management and Security .....	44
Annex B.9: Domains for Common Competencies.....	47
Annex C: Public sector workforce .....	50
Annex D: ICT Skills for Citizens.....	52

## Document Information

<b>File Name</b>	ICT Human Capital Development Standards
<b>Document Description</b>	Provides compliance requirements for Standards Governing ICT Human Capital Development in Government
<b>Original Authors</b>	ICT Standards Technical Task Team
<b>Creation Date</b>	August, 2018
<b>Last Update</b>	None
<b>Report Number</b>	1
<b>Version</b>	Version 1.0 (F)

## Document Approval

<b>NAME (SZI STANDARDS REVIEW COMMITTEE)</b>	<b>TITLE</b>	<b>DATE</b>
Dr. Martine G. Mtonga	National Coordinator	
Mr. Percive Chinyama	Director - Standards	

## Document Distribution

<b>NAME</b>	<b>TITLE</b>	<b>ORGANISATION</b>
Dr. Martine G. Mtonga	National Coordinator	Smart Zambia Institute
Mr. Percive Chinyama	Director - Standards	Smart Zambia Institute
Mr. Milner Makuni	Director - EGovernment	Smart Zambia Institute
Stakeholders	Directors and Managers	PSMD, ICTAZ, MoTC and ZICTA
All Heads of ICT	Heads of ICT	All MPSAs

## Document History/Record of Updates

<b>DATE</b>	<b>AUTHOR/S</b>	<b>VERSION</b>	<b>DESCRIPTION</b>
August, 2018	ICT Standards Technical Task Team	Issue 1.0 (D)	Produced by SZI
February, 2019	ICT Standards Technical Task Team	Issue 1.0 (F)	Produced by SZI

# Abbreviations

<b>GWAN</b>	Government Wide Area Network
<b>CAATs</b>	Computer Aided Audit Techniques
<b>CGEIT</b>	Certified in Governance of Enterprise Information Technology
<b>CCNA</b>	Cisco Certified network Associate
<b>CISA</b>	Certified in Information Systems Audit
<b>CISM</b>	Certified Information Security Manager
<b>DIY</b>	Do It Yourself
<b>HRD</b>	Human Resource Development
<b>ERP</b>	Enterprise Resource Planning
<b>GHRIS</b>	Government Human Resource Information System
<b>ICT HCDM</b>	Information Communication Technology, Human Capital Development and Management
<b>ICT</b>	Information and Communication Technology
<b>ICTBL</b>	Information and Communication Technology Capacity Building literacy
<b>ITIL</b>	Information Technology Infrastructure Library
<b>ITSM</b>	Information Technology Service Management
<b>IISP</b>	Institute of Information Security Professionals Skills Framework
<b>ZICTA</b>	Zambia Information and Communication Technology Authority

# 1.0 INTRODUCTION

The purpose of this document is to establish clear guidelines, based on industry experience, domain knowledge and Government's strategies and objectives, for selecting the appropriate skill set for efficient and effective public service delivery. The ICT Human Capital Development standards are required to support the goals of the Government by providing principles for enhancing performance through capacity building and enhancement of ICT personnel.

The standards defined are based on delivering the highest value possible to the Government. Throughout the process of defining standards, an effort was made to understand Government needs and balance those needs against total cost of ownership. The goal is to have a long-term ICT Human Capital Development portfolio that meets the needs of the Government. Due to the costs associated with maintaining ICTs, there is need for a fully trained and skilled personnel for each development option to ensure sustenance and compliance.

Human capital is the measure of economic value that an employee provides, through their knowledge, skills and abilities. The process of developing human capital requires creating the necessary environment in which employees can learn better and apply innovative ideas, acquire new competencies, develop skills, behaviors and attitudes. Therefore, it can be stated that human capital development revolves around Talent management.

ICT Human Capital Development aims at, building ICT skills and more importantly at exploiting the potential of ICT to build professionalism in conducting Government Business. This will also assist to develop proficiency in management practices in order to enhance the quality of service delivery to the citizenry.

## 1.1 Objectives

**The objectives of this standard are to:**

1. Ensure that ICT training and capacity building activities undertaken within the public service advance national goals and priorities;
2. Increase the efficiency and effectiveness of technical and non-technical government personnel to deliver public services to the citizens through the use of ICT;
3. Provide clear guidelines for efficient management of ICT trainings for MPSAs;
4. Provide guidelines for enhancing capacity for the job role;
5. Strengthen Public Sector standards on performance and support MPSAs to clearly describe staff performance expectations;



6. Help standardise and enhance the quality of ICT training in government and ensure that each and every employee participates in a properly structured ICT training process to maximize work performance and deliver services to citizens;
7. Assist in providing guidance in developing an ICT training plan for civil servants;
8. Design a system to ensure that budgets for ICT training are focused on priority areas;
9. Outline the authority, expectations and responsibility for various stakeholders involved;  
and
10. Provide a framework for Monitoring and evaluating ICT training.

## 2.0 SCOPE

This standard sets out the minimum requirements for ICT Human Capital Development and Management to ensure that all Public Service employees are equipped with the necessary ICT skills and competencies required to interact with government services and be productive to compete in the global economy.

## 3.0 APPLICATION

**The standard applies to:**

1. Government Ministries;
2. Government Agencies;
3. Commissions; and
4. Government Agents.

## 4.0 NORMATIVE REFERENCES

The Public Service Human Capital ICT Development Standard is subject to revision and, any reference to a standard is deemed to be a reference to the latest edition as detailed in the list below (Information on currently valid national and international standards can be obtained from Zambia Bureau of Standards - ZABS):

1. SIFA: *Skills Framework for the Information Age*;
2. ITIL: *Information Technology Infrastructure Library*;
3. CoBIT: *Control objectives for Information and Related Technologies*;
4. PRInCE2: *Projects in Controlled Environment v2*;
5. Zambian Constitution;

7. Terms and Conditions of Service for the Public Service, and guidelines for Human Resource Development in the Public Service; and
8. The Code of Ethics. se

## 5.0 BENEFITS OF ICT HUMAN CAPITAL DEVELOPMENT

ICT Human Capital development is aimed at ensuring availability of adequately skilled staff to carry out ICT and ICT related functions as required in the **MPSAs**. It will bring about the following benefits:

### 1) **Increased Employee Satisfaction**

Investing in professional development of the ICT officers in the Public Service is one of the motivation factors at the place of work that directly leads to greater job satisfaction. Internal professional education for Public Service ICT officers notifies them that the Public Service cares about their careers. Research shows that when employees feel their career development is a matter of concern to the organisation, in this case Government, they would likely be more determined to ensure quality, efficient and effective delivery of their services due to their increased levels of motivation. This in turn culminates into improved public service delivery.

### 2) **Improve Retention Rates**

Officers who are receiving professional education and development are less likely to seek other employment opportunities outside the organisation. Therefore, if an employee can advance within the Public Service, he or she will not have to look for advancement opportunities outside of the Public Service.

### 3) **Develop Employee Engagement**

Increasing employee engagement is a priority for every organisation. Engaged employees are more productive and loyal to the organisation. Investing in employee development can help to grow your employee engagement. Giving your staff career advancement opportunities and investing in their development gives them a reason to be engaged at work. Ideally, each organisation should be interested in the development of its workers in areas that would be beneficial to the organization's outputs. Personalization of employee development opportunities is a great tool to engage employees.

#### **4) Develop Client Engagement**

As previously discussed, employees who are given growth opportunities are more likely to be satisfied with their job and be engaged in the organisation. Employees are the face of every organization. When customers interact with staff that are engaged and satisfied, they are more likely to have a positive experience. Every positive experience, in turn, increases customer engagement and satisfaction. The more satisfied your employees are, the more likely your clients are to be satisfied in return.

#### **5) Improve Return on Investment (ROI)**

Every organisation invests in human capital, whether it understands it or not. Your staffs' salary, benefits, and perks are all an investment in your institution's human capital. Spending money on ICT infrastructure and not investing in ICT staff development would be an unpleasant investment for your organisation as it could result in poor utilization of the infrastructure. Your institution needs to spend money on developing its workers to maximize the return on your human capital investment. Improve your employees' performance by offering opportunities for growth and learning. This will ultimately improve your institutional performance.

#### **6) Improved Organizational Communication**

Human capital management allows for an enhanced flow of information throughout your organisation. Investing in your human capital can result in better communication by improving the quantity and quality of information passing between officers in your institution.

Human capital development works to improve every area of employee performance, including communication. This process can help your organisation to identify employees who may be lacking communication skills and assist them in remedying this situation.

When communication improves, so does the performance of the institution. Better communication leads to better employee satisfaction and engagement. This improvement, in turn, leads to enhanced overall performance and productivity.

#### **7) Better Recruitment**

Human capital development not only helps you to retain your employees, but it also helps you to recruit prospects. The importance of human capital development in the recruiting process will only continue to grow as more individuals seek to be employed in an organisation that cares about their career development.

## 8) Greater Organisation Culture

Another benefit of investing in your human capital is improving your organization's culture. Better employee satisfaction, engagement, and communication lead to an improved overall culture. Employees want to learn, they want to develop their careers, and they want to enjoy going to the office every day. A positive culture leads to engaged and happy employees. This happy culture increases your employees' productivity, which improves your institutional performance.

## 6.0 SUB DOMAINS

The sub - domains of this standard are:

### 6.1 ICT Professionals in the Public Sector

The Government shall ensure that it defines the capacity requirements for ICT personnel and provide a framework to regularly verify that personnel have the competencies to fulfill their roles.

### 6.2 Public Sector Workforce

The Government shall ensure that the ICT professionals have the minimum required level of knowledge and competence required that will enable them to ensure that government services are adequately provided.

### 6.3 ICT Skills for the Zambian Citizens

The Government shall ensure that the minimum required level of ICT knowledge and competence required by citizens to interact with government services are made available through **MPSAs**. This is aimed at equipping them with the necessary ICT literacy skills and competencies needed for better communication.

### 6.4 ICT Professionals in the Public Sector

The Government shall ensure that the Technical Personnel supporting the entire ICT infrastructure in the public service will use standardized Human Capacity development guidelines to ensure that public sector wide ICT government e-services are uniformly provided. This document is aimed at enhancing technical capacity for government ICT technical staff by ensuring that all ICT technical personnel acquire adequate technical qualifications, skills and competencies to transform ICT infrastructure, applications and environment into government business enablers that will add value to service delivery for the benefit of all the citizens.

### 6.5 ICT Institutions / Training providers

The Government shall collaborate with Public Service ICT training providers to ensure that the minimum requirement for managing and regulating the operations of the ICT institutions that provide capacity building are met.

### 6.7 ICT End Users

The e-Government Division shall ensure that End Users in Government are provided with ICT capabilities to communicate with each other, share ICT resources and be able to deliver value services to the citizens.

## 7.0 REQUIREMENTS

The Government shall provide an ICT capacity development and Literacy guidelines that will ensure increase in ICT literacy and reduction of the internal digital divide and improve e- Competencies management.

The requirements in this document shall provide the minimum required level of knowledge and competencies required to enable employees and citizens be equipped with the necessary ICT skills and competencies they need to interact with government services and to ensure ICT professionalism in conducting ICT activities in the sector.

As new technologies are developing rapidly, e-skills are increasingly getting sophisticated and there is need to be constantly updated. The standard intends to reduce the impact of e-skills shortages, gaps and mismatches and a digital divide by developing and implementing e- competencies that shall cater for digital inclusion.

The ICT capacity development and Literacy policy will enforce digital inclusion and ensure that e-competencies management for government agencies and stakeholders are periodically reviewed, validated and nationally adopted.

The Government shall also develop a legislation which shall provide for the Regulation of the ICT profession in Zambia. The legislation shall provide for the establishment of the professional body that will regulate ICT Professionals.

The Legislation shall provide minimum requirement for managing and regulating the ICT operations of a Public service institution in Zambia.

Table 1: Sub domains

Sub Domain Description Requirement	Description	Requirement
ICT Professionals in the Public Sector	IT professionals are individuals with the attitude, skills, knowledge and qualifications required to carry out specialized tasks in a recognized field of IT.  It defines the capacity requirements for ICT personnel and provides a framework to regularly verify that personnel have the competencies to fulfil their roles & to support Government organizations achieve their institutional goals.	Annex B
ICT Skills for Public Sector workforce	Defines the minimum required level of knowledge and competence required to enable employees and citizens be equipped with the necessary ICT skills and competencies they need to interact with government services & provide Services.	Annex C
ICT Skills for Citizens	Defines the minimum required level of knowledge and competence required to enable citizens to be equipped with the necessary ICT literacy skills and competencies, they need to interact with government services.	Annex D

## 7.1 ICT Competency for ICT Professionals in the Public sector

ICT Competency Standards for ICT professionals in the public sector defines the basic knowledge and skills an individual must possess at a recognized level of competence in order to perform in a specific ICT fields or job role and the code of conduct thereof.

The document addresses the issue of skills Management, and Management of Human Resource gaps in an IT Department. It defines the capacity requirements for ICT personnel and provides a framework to regularly verify that personnel have the competencies to fulfil their roles. The standard shall in terms of competencies ensure the following:

- 7.1.1 ICT professionals are individuals with the attitude, skills and knowledge required to carry out specialized tasks in a recognized field of ICT;
- 7.1.2 ICT professionals follow a code of conduct that ethically defines their behaviour with regard to organizational (MPSAs) systems, processes and procedure;
- 7.1.3 ICT professionals have the capacity and skills required to support Government organizations in achieving their strategic goals;

- 7.1.4 The Government shall ensure there are sufficient, high morale, qualified, certified and well positioned ICT professionals to meet its strategic goals;
- 7.1.5 The Government shall manage ICT professionals based on various international standards e.g. ISACA, SIFA, ITIL, CoBIT;
- 7.1.6 Collaboration with training institutions to provide minimum required level of knowledge, professionalism and competence in the ICT field.
- 7.1.7 The Knowledge and skills in competency areas in all the standards are presented with emphasis on essential areas of learning.
- 7.1.8 The sub domain covers the core body of knowledge and common basic competency Skills that are either behavioral or technical that shall be required by professionals. The sub domains are:
- a) Network infrastructure;
  - b) Solutions development, deployment and maintenance;
  - c) Architecture, Analysis and Design;
  - d) Business Change;
  - e) Information Management and Security;
  - f) ICT Project Management; and
  - g) ICT Service Management and Delivery.

**Table 2: Core Competencies for ICT professionals**

<b>Sub Domain</b>	<b>Description</b>	<b>Requirement</b>
Network Specialist	Responsible in setting up an organization's computer system, connecting users, continually assessing the current system, recommending improvements, administration and keeping the network secure from unwanted and unauthorized users.	Annex B1
Network administration	Professionals who are involved in managing information technologies, Internet, network systems, maintenance / upgrading	Annex B2

	/troubleshooting of computer systems and applications	
ICT Professionals in public sector infrastructure design and planning	Provide high quality customer services that involves Planning, installing, testing, and maintaining required telecommunication equipment and facilities; constructing and modifying facilities; maintaining a safe and secure work environment; and coordinating activities with other telecommunication service providers.	Annex B3
ICT Service management and delivery domains	Provides technical assistance to facilitate the installation, implementation, maintenance, customer education, and documentation of a variety of information technologies and serves as the key link between an organization and its stakeholders.	Annex B4
Systems development and implementation domains	Computer professionals whose primary role is to develop and implement application systems. In this standard, application developers pertain to programmers, system analysts, database administrators; web development and system administrators.	Annex B5
Systems Architecture, Analysis and Design Domains	Computer professionals whose primary role is to analyze and design application systems.	Annex B6
ICT Project management Domains	Computer professionals whose primary role is to manage ICT projects	Annex B7
Domains for Information Management and Security	Computer professionals whose primary role is to manage information security	Annex B8
Domains for Common competencies	Provides common competencies for ICT professionals	Annex B9
Domains for interpersonal common requirements	Provides interpersonal common requirements for ICT professionals	Annex B10



## 7.2 Capacity competency for end users and citizens

This document shall establish a common and unifying competency activities across the public sector and among the citizens in order to enhance e-competences necessary for the provision and delivery of e-Government services. The requirements shall provide the minimum required level of knowledge and competence required to enable employees and citizen be equipped with the necessary ICT skills and competencies they need to interact with government services and to ensure ICT professionalism in conducting ICT activities.

As new technologies are developing rapidly, electronic skills (e-skills) are increasingly getting sophisticated and there is need to be constantly updated. The standard intends to reduce the impact of e-skills shortages, gaps and mismatches and a digital divide by developing and implementing an ICT capacity development and Literacy policy that shall cater for digital inclusion.

The government shall provide an ICT capacity development and Literacy policy that will enforce digital inclusion and ensure electronic competencies (e-competencies) management for government agencies and stakeholders are periodically reviewed, validated and nationally adopted.

## 7.3 Collaboration with ICT Capacity Training Providers

The standard will strengthen and structure the ICT profession and its governance in the Zambian Public Service to enhance its contribution to attainment of the Government digital transformation agenda. The Government shall collaborate with relevant stakeholders to ensure the Regulation of the ICT professionals in Zambia.

The standard shall provide guidelines to collaborate with institutions offering ICT capacity building. The standard provides the process of continuous monitoring of the quality of ICT services delivered and ICT professionals conduct.

## 7.4 ICT Professionals Certification and Accreditation

This standard guide that the operation, certification and accreditation of an ICT professional in the public service shall be in accordance with the relevant education and qualification authority.

The standard will allow training providers and government to ensure ICT professionals in the public sector have the skills they need to excel in their roles and help the nation compete globally.

It provides a range of competence, knowledge and understanding statements that help learning providers develop courses to meet the ICT sector's skills needs and provide guidance to regulators when accrediting qualifications.

Employers can also use the standard to assess individuals' skills, reducing risks when recruiting and assigning responsibilities and compare qualifications and training options, to understand what they cover and get value for money.

This standard applies to all ICT professional in the public sector including but not limited to:

- i. ICT Technician;
- ii. ICT Graduate;
- iii. ICT Practitioner; and
- iv. ICT Professional.

The sub domain covers common basic competencies Skills that are either behavioral or technical that shall be required by all professionals. The sub domains are:

- i. Architecture, Analysis and Design;
- ii. Business Change;
- iii. Information Management and Security;
- iv. ICT Project Management;
- v. ICT Service Management and Delivery;
- vi. Solution Development and Implementation; and
- vii. Transferable Competencies.

## 8.0 Annexes

### Annex A: Definitions

Standard Conventionally	A standard is defined as an accepted or approved example or technique against which other things are judged or measured, or which sets out a set of criteria that serves as a guideline for how something should be done; acceptable level and scope of attainment of proficiency; a reference point against which other things are judged or measured.
Accreditation	Means the certification, usually for a particular period of time, of a person, a body or an institution as having the capacity to fulfil a particular function.
Area of knowledge	Development and certification Identify the essential areas of learning and understandings that underpin the area of competence described in the standard. It also indicates broad areas of learning and development and certification that an individual will consider strengthening this specific area of competence.
Assessment	Means the process of collecting evidence of learners' work to measure and make judgments about the achievement or non-achievement of specified ICT qualification(s) in the Zambia national Qualification standards/framework.
Assessor	Means the person who is registered by the relevant Education and Training Quality Assurance Body in accordance with criteria established for this purpose by the SZI Standards Department to measure the achievement of specified national Qualifications Framework standards or qualifications, and "constituent assessor" has a corresponding meaning.
Auditing	Is an event conducted within a specified period to evaluate some assessment of quality.
Competency	The possession of required skill, knowledge, qualification and capacity to undertake specific functions. It is Knowledge, skill, ability, or characteristic associated with high performance on ICT Human Capital and Workforce Development Standard.
Competency Standards	ICT competency standards are statements of the skills, knowledge and attitudes expected of personnel in responsibilities in their workplace and describe the progression of competencies.
ICT Technical Personnel	Are all the government employees whose designations fall under the ICT scheme of service. These technical personnel provide internal ICT technical services within or across MPSAs.

Capacity building	The process by which the individuals and governments increase its ability to perform, solve problems, define objectives, understand and deal with development needs to achieve objectives in a sustainable manner. Capacity building in this standard is in the context of workforce development.
E-Government Service	Are public services provided electronically by a Ministry or Government Department, Local Authority, or body established by or under any law or controlled or funded by the Government.
Electronic Learning (e-Learning)	Learning provided electronically by an accredited institution without the learner physically attending classes at the institution.
Information and Communications Technologies	The technologies including computers, telecommunication and audio-visual systems, that enable the collection, (ICT) processing, transportation and delivery of information and communication services to users.
Infrastructure	Integrated system of facilities used to provide one or more ICT services.
Job Role	The Job Role represents the position an ICT professional in a government agency.
Job Description	A brief explanation of the responsibilities covered by the job role. Indicators Identify the actions an ICT professional would normally take to perform the area of competence detailed in the relevant statement.
Monitoring	A continuous process of review of quality that can be conducted internally and/or externally to recommend quality improvements.
Professional  ICT Professionals	A person certified by a professional body of belonging to a specific profession by having completed a required course of studies and/or practice and whose competence can usually be measured against an established set of standards. Possess a comprehensive and up-to-date understanding of A relevant body of knowledge.
Professional development	Focuses on improving professional competence in a performance and career progression opportunities.
Professional body	An organization that accredit professional qualifications and represent the industry. Certifies successful completion of its requirements, and thereupon awards a license and bestows a recognized appellation.

Provider	A body which delivers learning programmes which culminate in specified national Qualifications Framework standards or qualifications and manages the assessment thereof.
Qualification	a pass of an examination or an official completion of a course, especially one conferring status as a recognized practitioner of a profession or activity.
Quality Assurance	The process of ensuring that the degree of excellence specified is achieved
Relevant body of knowledge	Encompasses the requirement for a broad and deep knowledge base, which is up-to-date, accommodating both a common ICT body of knowledge, and pertinent specialist knowledge and skills.
Training	Official and on-going educational and skill enhancement activities within an institution designed to enhance fulfilment and work performance of employees.
ICT Practitioner	An individual actively engaged in an ICT profession ICT professional Is someone who has a demonstrated mastery of an appropriate portion of the ICT body of knowledge and commitment to abide by the code of ethics.

## Annex B: ICT Professionals in the Public Sector

Reference is to be made to the following standard domains:

- 1) Infrastructure;
- 2) Systems and Applications;
- 3) Information Security;
- 4) ICT Governance; and
- 5) Electronic Records and Data Management

While implementing the standards several ICT policies, frameworks, education and learning strategies shall be adopted. These shall include the following:

- 1) Public Service ICT Qualification framework to guide in assessing professional development;
- 2) Public sector ICT competency framework to assess and categorise capacity development areas;
- 3) Curricula to standardize the outcomes of the ICT human Capital development initiative;
- 4) E-Learning framework to provide an environment for continuous life learning. ICT industry partners platforms shall be used to complement the learning both for the citizens and the public servants;
- 5) ICT Human capital development frameworks for citizens and public sector workforce; and
- 6) ICT training manuals and templates to harmonise training program delivery.

## ICT INFRASTRUCTURE AND MANAGEMENT

### Annex B.1: Job Role: Network Specialist

Table B.1 – Areas of development, Knowledge, Certification, skills and competency

Area of development	Certification	Compliance	
		Yes	No
Network Architecture			
Data Communication			
Network Operating Systems			
LANs and WANs			
Network Security			

NETWORKING	Description: Covers skills required to plan, set-up, configure, maintain, troubleshoot and secure a Local/Wide Area Network		Compliance	
	Requirement	Indicators	Yes	No
1	Understand and explain the basics of network architecture	Explain the Characteristics and uses of network components (e.g. hub, switches, routers, firewall)		
		Identify LAN transmission methods (e.g. bus, pure ring, star ring topologies)		
		Understand broadband and baseband transmission methods and standards		
		Identify LAN transmission media (e.g. twisted pair, fiber optic cable, wireless)		
		Understand and explain LAN medium-access protocols (e.g. CSMA/CD, token bus, token ring, FDDI)		
		Identify the components of, and relationships within, the OSI 8802 (IEEE 802) protocol suite		
		Identify LAN performance factors (signal attenuation, signal propagation delay)		
		Compare/contrast various frame formats for LANs		
		Understand and explain the OSI reference model		
		Differentiate between a physical and logical topology		
2	Understand and explain the basics of	Understand and characterize Ethernet topology		

	Ethernet and wireless LAN technologies	Understand Ethernet media-access algorithm		
		Explain basic Ethernet configurations (e.g. repeaters, hubs and bridges, server, switches)		
		Evaluate the advantages and disadvantages of an Ethernet network		
		Identify the key components of wireless LAN technology (e.g. spread-spectrum radio, infrared light, narrow-band radio)		
		Evaluate the advantages and disadvantages of a wireless LAN		
3	Understand and explain the basics of token ring and FDDI and other legacy networking technologies	Characterize a token ring network		
		Explain the token ring information-flow/media-access control		
		Understand and explain the token ring send algorithm		
		Identify token ring configurations (simple, IBM host)		
		Evaluate the advantages and disadvantages of a token ring network		
		Identify token bus configuration		
		Evaluate token bus advantages and disadvantages		
		Explain Fiber Distributed-Data Interface (FDDI) technology		
4	Understand and explain basic communication protocols	Explain basics of TCP/IP layers, components, and functions		
		Identify how the TCP layers relate to the OSI model		
		Discuss the TCP and IP delivery service		
		Identify TCP/IP applications and services (e.g. rlogin, SMTP, telnet, FTP, Domain, NFS)		
		Explain the TCP/IP protocol details (e.g. Internet addresses, dotted decimal notation, ARP, RARP, IP datagram format, routing IP datagrams, TCP segment format)		
		Identify the services provided by the major TCP/IP applications		
5		Explain the ARPANET, MILNET and NSFnet and their relationship to the Internet		



	Identify appropriate network operating systems	Differentiate between architectures (e.g. ISO, SNA, DNA)		
		Discuss how names and addresses are determined for LANs		
		Discuss IPV4/IPV6 Addressing, Allocation and management		
		Differentiate between an ordinary and gateway node		
		Identify the basics of the ARP/RARP protocol		
		Identify the contents of the Address Resolution Protocol (ARP) cache		
		Identify the basics of the DNS, HTTP, telnet, and FTP Protocols		
		Identify the basics of the Simple Network Management Protocol (SNMP)		
		Compare/contrast SNMP functions to the OSI model		
		Identify the basics of the PAP and CHAP protocols		
		Identify the basics of MAC layer protocols		
		Identify the levels at which networking can occur		
6	Install and configure network operating system	Understand and explain the different types of network operating systems		
		<p>Identify the purposes of a network operating system (NOS)</p> <ul style="list-style-type: none"> <li>• Differentiate between network operating systems and data distribution systems</li> <li>• Identify how the four components of a network operating system (i.e., server platform, network services software, network redirection software, communications software) support network operations</li> <li>• Define the criteria used to evaluate network operating systems</li> <li>• Identify how protocols are supported</li> </ul>		

		<ul style="list-style-type: none"> <li>• Identify licensing requirements</li> <li>• Characterize client/server models</li> <li>• Analyze the advantages and disadvantages of the client/ server model</li> <li>• Identify the properties of open systems</li> <li>• Discuss LAN connectivity issues</li> </ul>		
	Identify and explain different network classifications and Topologies	<p>Identify network architecture</p> <ul style="list-style-type: none"> <li>• Differentiate between network systems and OSI</li> <li>• Identify capabilities of network systems</li> <li>• Identify network support systems</li> <li>• Discuss the different types of protocols</li> <li>• Identify network models</li> <li>• Identify unique network tools</li> </ul>		
	Identify the different LAN physical media	<p>Create domain trusts</p> <ul style="list-style-type: none"> <li>• Maintain domain controllers</li> <li>• Make policy changes</li> <li>• Employ policy templates</li> <li>• Create user accounts, groups, and login scripts</li> <li>• Control access to files and directories</li> <li>• Establish shared network resources</li> <li>• Configure network domain accounts and profiles</li> <li>• Implement system policies</li> <li>• Create roaming user profiles</li> <li>• Troubleshoot network performance</li> </ul>		
	Understand and explain network connectivity	<p>Interpret basic networking terminology</p> <ul style="list-style-type: none"> <li>• Differentiate between LANs, MANs and WANs</li> <li>• Explain how to integrate LANs into MANs and WANs</li> <li>• Identify the basic point-to-point network topologies (e.g. star, ring, tree, network, irregular)</li> <li>• Explain packet-switching techniques</li> <li>• Identify the basic broadcast topologies (e.g. star ring, bus)</li> <li>• Characterize and differentiate connection-oriented and connectionless networks</li> <li>• Identify standard high-speed networks (e.g. broadband, ISDN, SMDS, ATM, FDDI)</li> </ul>		

	<ul style="list-style-type: none"> <li>• Identify current trends and emerging networking technologies</li> </ul>	
Differentiate processes, services, and protocols	<p>Differentiate between baseband and broadband transmission</p> <ul style="list-style-type: none"> <li>• Explain Manchester encoding</li> <li>• Identify the criteria used in making cable selection decisions (e.g. physical properties, transmission technologies, transmission span, bandwidth, topology, security, noise immunity, installation installation considerations, cost)</li> <li>• Identify the different cable types (e.g. coaxial, twisted pair, optical fibres) <ul style="list-style-type: none"> <li>• Compare/contrast cable types</li> <li>• Identify the different types of cable connectors and grouping techniques</li> </ul> </li> <li>• Understand and explain the different cable standards (e.g. ANSI, EIA/TIA-568 B, EIA/TIA-569, TWSS, NEC)</li> <li>• Identify the advantages and disadvantages of LAN cabling systems</li> <li>• Understand how to conduct cable installation site survey</li> <li>• Understand how to estimate cable and components required based on installation site survey results</li> <li>• Identify the checks that need to be made prior to installing cable</li> <li>• Perform documentation and labeling when installing cable</li> <li>• Employ accepted methods for installing cable</li> <li>• Troubleshoot typical problems associated with cable installation</li> <li>• Perform cable testing and tolerance levels</li> <li>• Identify possible sources of interference and methods for overcoming each</li> </ul>	

## Annex B.2: Job Role: Network Administration

**Table B.2 – Areas of development, Knowledge, Certification, skills and competency**

Network administration Professionals who are involved in managing information technologies, Internet, network systems, maintenance / upgrading / troubleshooting of computer systems and applications

Area of development	Certification	Compliance	
		Yes	No
Types of topologies			
Types of network media and equipment			
Fiber optic technology			
TCP/IP protocol suites			
OSI reference model			
Types of network addresses			
IP addressing and subnetting			

IEEE, EIA-TIA and other networking standards			
LANs, WANs, MANs and VPNs			
Network troubleshooting and maintenance			
Advanced networking concepts			

NETWORK ADMINISTRATOR	Description: Job Description		Compliance	
	Requirement	Indicators	Yes	No
	i. Manage the organization's local area network ii. Setup the organization's network system iii. Interconnect users iv. Secure the network from unwanted and unauthorized users v. Troubleshoot network problems vi. Administer the daily operation of the network system vii. Plan and recommend periodic upgrades and improvements			
1	Understand and explain the basics of network architecture	Explain the Characteristics and uses of network components (e.g. hub, switches, routers, firewall)		
		Identify LAN transmission methods (e.g. bus, pure ring, star ring topologies)		
		Understand broadband and baseband transmission methods and standards		
		Identify LAN transmission media (e.g. twisted pair, fiberoptic cable, wireless)		
		Understand and explain LAN medium-access protocols (e.g. CSMA/CD, token bus, token ring, FDDI)		
		Identify the components of and relationships within the OSI 8802 (IEEE 802) protocol suite		

		Identify LAN performance factors (signal attenuation, signal propagation delay)		
		Compare/contrast various frame formats for LANs		
		Understand and explain the OSI reference model		
		Differentiate between a physical and logical topology		
2	Understand and explain the basics of Ethernet technology	Understand and characterize Ethernet topology		
		Understand Ethernet media-access algorithm		
		Explain basic Ethernet configurations (e.g. repeaters, hubs and bridges, server, switch)		
		Evaluate the advantages and disadvantages of an Ethernet network		
3	Understand and explain the basics of token ring and FDDI and other legacy networking technologies	Characterize a token ring network		
		Explain the token ring information-flow/media-access control		
		Understand and explain the token ring send algorithm		
		Identify token ring configurations (simple, IBM host)		
		Evaluate the advantages and disadvantages of a token ring network		
4	Understand and explain the basics of token bus, Fiber Distributed-Data Interface (FDDI), and wireless LAN technology	Identify token bus configuration		
		Evaluate token bus advantages and disadvantages		
		Explain Fiber Distributed-Data Interface (FDDI) technology		
		Identify the key components of wireless LAN technology (e.g. spread, spectrum radio, infrared light, narrow-band radio)		
		Evaluate the advantages and disadvantages of wireless LAN		
5	Understand and explain The TCP/IP	Explain basics of TCP/IP layers, components, and functions		

	protocol			
		<ul style="list-style-type: none"> <li>Identify how the TCP layers relate to the OSI model</li> </ul>		
		<ul style="list-style-type: none"> <li>Discuss the TCP and IP delivery service</li> <li>Identify TCP/IP applications and services (e.g., rlogin, SMTP, telnet, FTP, Domain, NFS)</li> </ul> <p>Explain the TCP/IP protocol details (e.g., Internet addresses, dotted decimal notation, ARP, RARP, IP datagram format, routing IP datagrams, TCP segment format)</p> <p>Identify the services provided by the major TCP/IP Applications</p> <p>Explain the ARPANET, MILNET and NSFnet and their relationship to the Internet</p>		
6	Understand and explain basic communication protocols	Discuss how names and addresses are determined for LANs		
		Identify components of a Class B Internet address in dotted decimal form		
		Differentiate between an ordinary and gateway node		
		Discuss the importance of IPX/SPX protocol and how it works together with TCP/IP		
		Identify the basics of the ARP/RARP protocol		
		Identify the contents of the Address Resolution Protocol (ARP) cache		
		Identify the basics of the DNS, HTTP, telnet, and FTP protocols		

		Identify the basics of the Simple Network Management Protocol (SNMP)		
		Compare/contrast SNMP functions to the OSI model		
		Identify the basics of the PAP and CHAP protocols		
		Identify the basics of MAC layer protocols		
		Identify the levels at which networking can occur		
		Differentiate between architectures (e.g. ISO, SNA, DNA)		
7	Identify appropriate network operating systems			



## Annex B.3: ICT Professionals in the public sector

ICT Technology infrastructure design and planning provide high quality customer services that involves planning, installing, testing, and maintaining required telecommunication equipment and facilities; constructing and modifying facilities; maintaining a safe and secure work environment; and coordinating activities with other telecommunication service providers.

ICT PROFESSIONALS	Description: Job Description		Compliance	
	Requirement	Indicators	Yes	No
	i. Administer and manage the organization's ICT Systems iii. Interconnect systems iv. Secure the systems from unwanted and unauthorized users v. Troubleshoot system problems vi. Administer the daily operation of the system vii. Plan and recommend periodic upgrades and improvements			
1	Follow, under supervision, organisational strategy for ICT infrastructure design and planning activities	Correctly follow the processes, tools, and techniques to use for ICT infrastructure design and planning activities.		
		Fully comply with all organisational strategy, policies, and standards relating to infrastructure design and planning activities, and their deliverables.		
		Correctly reference all relevant design and configuration principles and standards that apply to ICT infrastructure supporting an organisation.		
		Correctly gather and collate all relevant information contained within the service catalogue any service level agreements, service improvement, and service quality plans, that are required for ICT infrastructure design and Planning activities.		
		Accurately source all relevant information concerning problems or errors with any existing infrastructure product/service, and/or items of equipment, so that it may inform ICT infrastructure design and planning activities, under direction.		

		Accurately source all relevant information required to assess the suitability of ICT infrastructure Components for any particular design assignment, under direction.		
		Correctly follow the systems development lifecycle, service lifecycle, and reference all relevant ICT architecture models, as appropriate to infrastructure design and planning activities.		
		Accurately source and collate any relevant information about the capabilities and availability of ICT products, services, and equipment, in order to make well-reasoned decisions on whether they can be incorporated into designs for ICT infrastructure, under direction.		
		Correctly source any relevant internal and external sources of expertise, in particular, infrastructure products, services, and equipment as and when required during infrastructure design and planning activities.		
		Correctly identify any potential implications of customer demands and service requirements, using any information relating to them appropriately in relation to ICT infrastructure design and planning activities, under direction.		
		Correctly implement and maintain the processes, tools, and techniques to use for ICT infrastructure design and planning activities.		
		Correctly identify what are the available ICT equipment products and services that can be considered when designing and planning ICT infrastructure, under direction. Correctly identify any potential implications of business change,		

		projects, programmes, organisational design, and/or business process design/redesign activities on ICT infrastructure design and planning activities.		
		Critically analyse all relevant information from service improvement and service quality plans, and other related design activities, that may affect ICT infrastructure design and planning activities		
		Consider the available and suitable ICT equipment products and services when designing and planning ICT infrastructure. Correctly identify the implications of		
		current and future business and customer needs on ICT infrastructure design and planning activities. Correctly identify any potential implications of designing ICT		
		infrastructure that makes use of external infrastructure products, services, and equipment, either wholly or partially. Correctly identify where design work, associated with ICT infrastructure design		
		and planning activities for individual components or groups of components, can be allocated to appropriate individuals of teams. Verify the accuracy, currency, completeness, and relevance of all		
		information used during ICT infrastructure design and planning activities. Verify the reliability of information about the capabilities and availability of ICT products, services, and items of		
		equipment. Design effective strategy and policies relating to all aspects of ICT		

		infrastructure design and planning activities.		
		Design specific and meaningful metrics to assess the performance of ICT infrastructure design and planning activities.		
		Correctly identify, anticipate, and respond effectively to business strategy changes to the operating model, and other strategic issues that may impact on the ICT infrastructure supporting an organisation		
		Correctly identify the implications of the service strategy and service delivery operation objectives on ICT infrastructure design and planning activities.		
		Correctly identify any implications for an organisation's operational effectiveness, brand and reputation that may result from ICT infrastructure design and planning activities.		
2.	Carry out, under supervision, customer requirements for ICT infrastructure design and planning	Critically interpret, and accurately document, customer demands for new and/or enhanced services from IT/ technology infrastructure, and the requirements for the design and planning of an individual ICT infrastructure component		
		Correctly identify who are the external providers of ICT infrastructure used by the organisation and which components can be sourced from them.		
		Critically analyses all relevant information regarding the external providers of ICT infrastructure used by the organisation and the components that can be sourced from them.		
		Source any appropriate technical expertise required to inform and guide ICT infrastructure design and planning activities.		

		Verify any proposed designs and plans developed by others for any changes to existing ICT infrastructure.		
		Make clear and timely decisions to improve the quality and effectiveness of ICT infrastructure design and planning activities, and their deliverables, within an organisation.		
		Correctly identify what actions may be taken in the event of ICT infrastructure design and planning activities not supporting the business needs, service delivery/operation objectives, and/or the service strategy.		
		Make well-reasoned decisions on when, and how, to use external providers of ICT infrastructure design and planning services, selecting the preferred organisations and negotiating/contracting with them accordingly on behalf of the organisation. Ensure that ICT infrastructure designs		
		support the business needs.		
	Maintain effective ICT infrastructure design and planning deliverables	Routinely monitor the cost and complexity of new ICT infrastructure designs, and the quality and effectiveness of all ICT infrastructure design and planning activities, reporting any issues and findings to superiors		
		Provide effective and timely advice and guidance to other individuals on the total effort, elapsed time, risk, complexity, and cost that may be required to develop, test, and implement new designs for ICT infrastructure products, services, and equipment		
		Develop accurate and viable business cases and proposals for any changes to replacements, or refreshes, of ICT infrastructure ensuring that the designs and plans fall within approved cost guidelines, under direction.		

		Critically review the designs plans and any benefits and business case, including the total effort, elapsed time, risk, complexity, and cost for any ICT infrastructure design and planning assignment managed by other individuals.		
		Act decisively, and promptly, in the event of the deliverables of ICT infrastructure design and planning activities not supporting the business needs, and ICT architecture and analysis deliverables being inadequate, inaccurate, insufficient and/or inappropriate.		
		Routinely monitor the alignment of ICT infrastructure design and planning activities, and their deliverables, with business needs, service operation objectives, and the service strategy, taking action where appropriate.		
		Regularly monitor the quality and effectiveness of external providers of ICT infrastructure design and planning services, identifying and recommending action where appropriate.		
		Clearly and precisely report the results from monitoring the alignment of ICT infrastructure design and planning activities, and their deliverables, with business needs, service operation objectives, and service strategy.		
	Assist others relevant information concerning ICT/ technology infrastructure design and planning assignments	Provide clear and timely information with concerning ICT infrastructure design and planning to sponsors, stakeholders, and other relevant internal individuals and groups, as directed by superiors		
		Assist others in applying information about the capabilities and availability of ICT products, services, and equipment in order to make well-reasoned decisions on whether they can be incorporated into designs for ICT infrastructure.		

		Be fully accountable for the quality and effectiveness of the designs and plans for any individual ICT infrastructure component.		
--	--	--	--	--

## Annex B.4: ICT Service Helpdesk and Incident Management

ICT Service management and delivery domains Provides technical assistance to facilitate the installation, implementation, maintenance, customer education, and documentation of a variety of information technologies and serves as the key link between an organization and its stakeholders.

## ICT Service

Helpdesk and Incident Management	Description: Job Description		Compliance	
	Requirement	Indicators	Yes	No
1	i. Act as first point contact supporting organisation			
	Perform designated ICT Service Helpdesk and Incident Management activities under supervision	Apply designated procedures, tools, and techniques to respond to incident management and service request activities, under the direction of others.		
		Comply with any relevant legislation, regulations, and external standards relating to service desk/help desk activities and their deliverables, in own area of accountability. Communicate with customers of the service desk/help desk effectively, empathetically, courteously, and in a timely manner, in relation to incidents and service requests relevant to them.		
		Accurately validate, categorise, prioritise, and assign incoming incidents and service requests in line with procedures.		
		Fulfil service requests and close incidents where possible within the service desk/help desk in line with procedures.		
		Refer or escalate unfulfilled service requests and unclosed incidents in line with procedures.		
		Document the metrics that will be used within the service desk/help desk.		
		Be accountable for meeting service levels for incident management service request activities and the service desk/help desk.		



		Be accountable for identifying and meeting strategic, financial, and operational targets for incident management service request activities, and the service desk/help desk.		
		Be accountable for identifying and meeting strategic, financial, and operational targets for incident management service request activities, and the service desk/help desk.		
2	Congregate data to monitor and report on the effectiveness and customer satisfaction of Service Help desk and Incident management activities that you provide	Gather and document all necessary information required for the diagnosis of, and assignment of, incoming incidents and service requests.		
		Track the progress of incidents and service requests communicating, as required, with internal and external individuals and groups involved in their resolution and closure.		
		Identify, and make decisions, on what metrics and targets should be used to measure the Performance.		
		Review and report the effectiveness of incident management and service request activities and the operational performance of the service desk/help desk against metrics.		
3	support the Identification and implement improvements and work-arounds to 'Service Help Desk and Incident Management' activities	Accurately interpret information gathered from individual customer calls/contacts to the service desk/helpdesk in order to ascertain the correct course of action/response, under supervision. Apply best practice in incident management activities.		
		Identify when and how to use external providers for all, or part, of incident management and/or service/access request services.		
		Review the implications of business needs for ICT service on the service desk/help		

		desk, and the quality and effectiveness of the service desk/help desk in meeting them.		
		Develop the metrics, service levels, and operational hours for the service desk/help desk to meet business needs, service delivery/operation objectives, and the service strategy.		

### Annex B.5: Systems Development and Implementation Domains

This section covers systems development and implementation for ICT professionals whose primary role is to develop and implement application systems. In this standard, application developers pertain to programmers, system analysts, software engineers, database administrators, web developers and system administrators.

Systems Development Implementation Domains	Description		Compliance	
	Requirement	Indicators	Yes	No
	Covers the skill set required to structure, plan, and control the process of developing a system: <ol style="list-style-type: none"> <li>i. Develop computer systems according to specifications;</li> <li>ii. Converts the system specifications into a logical series of instructions;</li> <li>iii. Codes these instructions in a conventional programming language;</li> <li>iv. Tests the program to ensure that the instructions are correct and produces the desired outcome; and.</li> <li>v. Updates, repairs, modifies, and expands existing programs.</li> </ol>			
		Apply techniques of physical representation to digital information (e.g., data, text, image, voice);		
		Apply techniques of data and procedural representation;		
		Use compilers and interpreters;		
		Use basic principles of programming for analyzing a problem;		
		Define the basic principles of structured, object-oriented, and event-driven programming;		

		Explain programming language constructs such as multitasking and exception handling;		
		Differentiate key programming languages and the environment in which they are used.;		
		Use appropriate development environment or platform.		
2	<b>Apply the principles of data structures and algorithm development for a specific problem</b>	Provide an overview of the problem to be solved;		
		State a problem and identify desired outputs for given inputs;		
		Describe the fundamental data types and their operations;		
		Design data structures to be used to solve the problem; and.		
		Design program logic using both graphical and pseudocode techniques.		
3	<b>Apply appropriate techniques in the stages of program development</b>	Differentiate the characteristics and uses of batch, interactive, event-driven and object-oriented processing;		
		Identify the use of program design tools;		
		Employ structured/modular programming;		
		Translate data structures and program design into code in a programming language;		
		Apply appropriate coding standards;		
		Apply computational and logical operations;		
		Use a version control tool; and		
		Compile and execute programs. 4		
4	<b>Create program documentation</b>	Document codes;		
		Write the technical reference manual; and		
		Write progress and status reports.		
5	<b>Test and debug programs</b>	Conduct performance testing;		
		Perform unit testing;		
		Perform integration testing;		
		Participate in code review;		

		Correct syntax errors;		
		Debug compiler-generated errors;		
		Correct run-time errors; and		
		Debug logic errors.		

## Annex B.6: ICT Systems Architecture, Analysis and Design Domains

Systems Architecture, Analysis and Design Domains includes ICT professionals whose primary role is to analyse and design application systems.

ICT Systems Architecture Analysis and Design Domains	Description and Job Description		Compliance	
	Requirement	Indicators	Yes	No
	<b>Initiate a system project</b>	Identify the phases in a system development project.		
		Select basic fact-gathering techniques to be used.		
		Define the scope of the system development project.		
		Conduct a preliminary investigation.		
2	<b>Perform a detailed system investigation analysis</b>	Identify time, technology and resource constraints. <b>and</b>		
		Determine investigation techniques to be used.		
		Record facts gathered through system investigation.		
		Perform appropriate diagnostic tests.		
		Define business problem to be solved by the application.		
		Define business information requirements.		
		Determine hardware and software needs.		
		Interpret source data, charts, and graphs.		
		Interpret existing operating documents and procedures for the system.		
		Observe and document existing procedures.		
		Research and evaluate technical alternatives.		
		Document possible alternative solutions.		

		Identify processing requirements.		
3	<b>Design computer applications</b>	Align information system (IS) design with the business processes.		
		Identify skills requirements of the project development team.		
		Determine the roles of user and management in the computer system development process.		
		Identify processing requirements.		
		Divide design specifications into logical blocks (e.g., flowchart, dataflow diagram, system flow record and layout and UML).		
		Recommend programming language and hardware requirement.		
		Differentiate between system documentation and user Documentation.		
		Apply rules for naming variables.		
		Define input and output (I/O) requirements.		
		Employ security mechanism in the application design.		
4	<b>Develop documentation</b>	Identify documentation needs.		
		Prepare System Development Specification documentation.		
		Establish documentation-update method.		
		Prepare user documentation (e.g., dataflow diagram, UML).		
5	<b>Perform quality assurance activities</b>	Identify evaluation criteria.		
		Develop test plan.		
		Conduct tests (e.g., system, functionality, integration).		
		Analyze test data.		
		Participate in formal technical reviews.		
		Present test results.		

		Adhere to Public Service ICT Standards.		
		Define, refine, or recommend Public Service ICT Standards.		
6	<b>Implement computer application systems</b>	Interpret existing operating documents and procedures for the system.		
		Assist in the preparation of system implementation plan.		
		Present implementation plan to users and management.		
		Assist implementation of new system.		
		Perform post-implementation evaluation of new system.		
		Identify deficiencies and recommend possible solutions.		
		Train personnel to use ICT systems.		
		Identify ongoing support requirements.		
7	<b>Manage requests for Changes to ICT Systems</b>	Facilitate dialogue with users and articulate issues based on user requirements.		
		Collaborate with other departments of the organisation who are involved with the ICT system development and implementation.		
		Apply analytical thinking to creatively solve complex problems.		

## Annex B.7: ICT Project Management Domains

ICT Project management includes computer professionals whose primary role is to manage ICT projects.

Area of development, knowledge, skills, competency and Certification:

Area of development	Certification	Compliance	
		Yes	No
Project selection models			
Project acquisition and risk analysis and management			
Change management			
Proposal and Technical writing			
Scope Management			
Time, Cost and Quality Management			
Communications Management			
Use of appropriate management software			
General communication skills			
Project Team Building			
Project Termination			
Project Negotiation			

ICT Project Management	Description	Compliance
	<p>Responsible for the management of government ICT projects involving the development and implementation of business processes to meet identified business needs, acquiring and utilising the necessary resources and skills, within agreed parameters of cost, timescales, quality and business impact using relevant tools and methodologies</p> <p><b>Description</b></p> <ul style="list-style-type: none"> <li>i. Manage and supervise Information System (IS) projects.</li> <li>ii. Define project plan, scope, goals/outcomes and tasks.</li> <li>iii. Organise a project team and define their roles and responsibilities.</li> <li>iv. Allocate project resources.</li> </ul>	



	v. Organise tasks into a schedule. vi. Communicate with and listen to clients and other key stakeholders.			
	<b>Requirement</b>	<b>Indicators</b>	<b>Yes</b>	<b>No</b>
	<b>Manage information system project methodologies</b>	Define the scope of the project and develop task list.		
		Evaluate project requirements i.e. resources and budget.		
		Secure resources.		
		Estimate time requirements.		
		Identify and track critical milestones		
		Evaluate project implementation risks.		
		Manage the change control process.		
		Utilise project management software.		
		Develop a method of project evaluation.		
2		<b>Define scope of work to achieve individual and group goals</b>	Identify size and specifics of the task.	
	Formulate task sequence.			
	Plan multiple tasks simultaneously.			
	Identify potential problems.			
	Develop contingency plans.			
3	<b>Develop time and activity plan to achieve objectives</b>	Coordinate plan with team, cross-functional groups, and or individuals.		
		Formulate a task strategy.		
		Prioritise tasks according to business needs.		
		Manage multiple tasks simultaneously.		
		Devise plan of action.		
4	<b>Manage work processes and procedures</b>	Analyse situation and create a work plan based on analysis of the situation.		
		Identify supplies and tools needed.		
		Develop budget guidelines.		
		Coordinate work processes and procedures.		
		Monitor and evaluate work processes and procedures.		

		Generate task status reports. 5		
	<b>Manage risks over the course of the project</b>	Consider both the impact and likelihood of risks.		
		Use contingency and management reserves appropriately.		
		Distinguish between risks (always in the future) and problems (in the present).		
		Take prudent risks and exploit unexpected opportunities.		
		View past problems as current risks and plan for them.		
6	<b>Manage communications over the course of the project</b>	Plan all types of communications.		
		Distribute pertinent information as per communication plan.		
		Report performance through an appropriate type of Communication.		

## Annex B.8: Information Management and Security

Domains for Information Management and Security includes ICT professionals whose primary role is to manage information security.

Information Management and Security	Description and Job Description		Compliance	
	Requirement	Indicators	Yes	No
	<p>Competencies required for the management of data and information within an organisation as well as when it crosses into and out of an organisation.</p> <p>Includes the acquisition, creation, categorization, storage, transfer and disposal of data and information. It also covers the competencies required to manage the integrity of and access to data and information</p>			
Carry out specified information management activities		Effectively carry out own responsibilities with regards to the management of data and information.		
		Ensure the integrity of data and information collected and used for own work.		
		Correctly classify and categorise data and information within own area of work.		
		Accurately provide specified data and information to others as authorised.		
		Comply with all relevant and applicable regulations, legislation and organisational standards relating to data and information management.		
		Correctly use specified processes, tools and techniques for assessing the compliance of data and information against regulation and standards.		
		Accurately maintain records relating to the management of data and information within own area of work.		
		Correctly identify and apply the processes, tools and techniques relating to information management activities.		
		Gather all appropriate and required information relevant to an organization and the individuals within it and using its services.		

		Verify the accuracy, currency and completeness of information created, collected, accessed, used and documented by information knowledge and data management activities.		
		Verify the appropriateness, currency and completeness of any data, information and knowledge assets that are being disposed of.		
2	<b>Document information assets</b>	Correctly document and store all relevant information on those responsible for information assets, in line with organisational policies and procedures.		
		Accurately document all required information relating to who can create, access, use, distribute and dispose of information assets.		
		Correctly document all specified information assets created, collected, accessed, used, distributed and disposed of.		
3	<b>Manage the classification and categorization of information</b>	Ensure that the location and properties of information are collated and recorded, to enable effective management, classification and categorization.		
		Classify and categorise information, in line with organisational policies and procedures.		
		Collate, accurately and concisely, information and data that define the procedures for the management of information assets supporting an organisation.		
4	<b>Communicate with others on information management activities</b>	Provide accurate, appropriate and timely information to internal and external stakeholders about the information assets held within ICT systems, services and assets, in line with policies and procedures.		
		Ensure all individuals within an organisation understand the importance and value of information assets created, collected, used, accessed, distributed, disposed of both with the organisation and as these assets are exchanged with external bodies and individuals.		

5	<b>Contribute to information management</b>	Correctly follow the processes, tools and techniques for information management activities.		
		Collate and record the location and properties of information within an organisation to enable it to be managed, classified and categorised effectively.		
		Correctly classify and categorise data and information within own area of work.		
		Provide timely access to information assets that are held within ICT systems, services and assets to authorised individuals in line with policies and Procedures.		
		Comply with all relevant and applicable legislation, regulations and external standards relating to the management of information assets.		
		Correctly document and store all relevant information on those responsible for information assets, in line with organisational policies and procedures.		
		Ensure that all relevant information assets are accurately identified.		
		Implement and accurately maintain the procedures within ICT systems, services and assets to classify, categorise and manage information, data, knowledge assets and how they are accessed.		
		Routinely monitor compliance with all relevant legislation, regulations, standards and professional and ethical standards relating to information management, taking action and reporting issues where appropriate.		
		Design effective processes, tools and techniques to monitor the creation, use, access to, distribution and disposal of information management assets.		
Provide appropriate, understandable and timely advice and guidance to others on				

		how to categorise, manage and use information assets contained with ICT/ technology systems, services and assets, applying own judgement and experience.		
		Manage the comprehensive classification, organisation and administration of information data and knowledge assets, contained within ICT systems, services and assets that is undertaken by others.		

## Annex B.9: Domains for Common Competencies

Domains for Common competencies provides common competencies for ICT profession

Area of development, knowledge, skills, Area of development	competency and Certification Certification	Compliance	
		Yes	No
Productivity Software			
Fundamentals of Information Systems			
Computer Security and Ethics			
Basic Computer Operations			
Standards and Industry Practices			

Domains for Common Competencies	Competency Descriptor:		Compliance	
	Requirement	Indicators	Yes	No
	Covers skills related to ICT basics, Internet Fundamentals, network systems, computer maintenance / upgrading / troubleshooting, computer applications, and the like.			
	<b>Explain the terms under Information Technology &amp; Communications Technology</b>	Define Information Technology, Communications Technology and other ICT related terms.		
		Identify the different types of computers.		
		Manage and store data/backup files.		

2	<b>Apply the concept of basic computer operation and other information devices including basic troubleshooting and maintenance</b>	Identify and define the functions of the main components (i.e. monitor, CPU, keyboard, mouse) of the computer.		
		Identify and define the functions of computer peripherals (i.e. printer, scanner, modem, digital camera, speaker, etc.) Properly connect main components, configure peripherals and install drivers when required.		
		Configure computer settings of various software and Hardware.		
		Explain the basic functions of the operating system.		
		Organise and manage computer files, folders And Directories.		
		Use storage devices (i.e. hard disk, diskette, CD, flash memory, etc.) for storing and sharing computer files.		
		Protect the computer from virus, spyware, adware, malware, hackers etc.		
		Use online and offline help facilities for troubleshooting, maintenance and update of applications.		
		Manage and store data/backup files.		
		Run/execute applications/programs.		
		Manage tasks. 3		
	<b>Use appropriate computer applications</b>	Find appropriate hardware and software for a variety of purposes.		
		Use common desktop operating systems.		
		Use basic word processing, spreadsheet, email, and presentation tools to automate regular tasks.		
		Identify and use latest ICT trends and technologies.		

4	<b>Describe the general concepts of Information Systems</b>	Identify the components of Information System.		
		Identify the types of Information Systems.		
		Know the Information System infrastructure.		



## Annex C: Public sector

Description	This standard covers the basic minimum competencies and skills that are required for an employee in the public sector to possess in order to deliver services and interact with government ICT systems.	Compliance	
		Yes	No
<b>Requirements</b>	<b>Indicator</b>		
<b>Introduction to e-Government</b>	MPSAs shall conduct sensitizations and training for Government employees in harnessing the potential of ICT in the delivery of Government services.		
<b>Producing Government Documents</b>	MPSAs shall conduct training programmes to end-users in various Government ministries and departments to the use of document processing in production of standard Government documents.		
<b>Government Communication</b>	MPSAs shall conduct training programmes to end-users in various Government ministries and departments to the use of ICT for effective communication and collaboration.		
<b>Preparing Government Budget</b>	MPSAs shall conduct training programmes to end-users in various Government ministries and departments to the use of word processors and spreadsheets in preparing Government estimates.		
<b>Making Presentations</b>	MPSAs shall conduct training programmes to the end users on how to make effective presentations using presentation software.		
<b>ICT Security</b>	MPSAs shall conduct training programmes and awareness to end users on the basics of ICT security covering issues and principles of security and information assurance including confidentiality, integrity, authentication, identification, authorisation, availability and access control.		
<b>User Support</b>	MPSAs shall conduct training programmes on quality customer service skills for effective customer-care strategies needed to provide excellent service.		
<b>Specific MPSA applications</b>	End users shall be trained on use of Help Desk effectiveness for their interpersonal skills, better communication, getting and giving good information, handling challenging behavior and managing telephone interactions. All applications provided by vendors to an MPSAs shall have a component for end user training and operational manuals for specific applications deployed by MPSAs.		

<b>e-Records Management</b>	MPSAs shall conduct training programmes for records officers on the importance of e-Records management.		
<b>Project Management</b>	MPSAs shall conduct training for staff implementing, managing and working on ICT projects. MPSAs shall ensure that all ICT projects have a training component in them further ensure that ICT officers are capacitated to supervise outsourced ICT projects, to undertake quality assurance and compliance and manage the project deliverable after project commissioning and enable knowledge transfer.		
<b>Business Process Reengineering</b>	MPSAs shall conduct training on business process re-engineering for senior officers.		
<b>ICT Leadership Governance</b>	MPSAs shall conduct trainings on ICT leadership and <b>and</b> governance for senior officers to champion ICT project implementations.		
<b>ICT induction course</b>	MPSAs shall conduct induction to all current and newly recruited personnel on ICT legal framework in Zambia.		
<b>ICT Literacy Assessment</b>	MPSAs shall conduct skills assessments for personnel to determine level of literacy awareness, competencies and expertise.		
<b>e-Learning office productivity applications</b>	MPSAs shall implement learning management systems to ensure personnel skills development and reduce cost of learning. Internet, Windows, spreadsheets, word processing, email, graphics etc.		
<b>Skills inventory systems</b>	MPSAs shall implement a skills inventory database system that will provide a framework for Monitoring and evaluating ICT training programmes and skills levels.		
<b>ICT resource centers</b>	MPSAs shall implement ICT resource center that has computer facilities to ensure all personnel can all can access and receive government information.		
<b>Review of schemes of service</b>	MPSAs shall regularly conduct a review of the ICT scheme of service to keep up with dynamics of technology advancement so that training and career progression is in accordance with international standards and best practice.		
<b>Digitization and automation training</b>	MPSAs shall conduct digitisation training for personnel responsible for automation in MPSAs.		

## Annex D: ICT Skills for Citizens

Description	This standard covers the basic minimum competencies and skills that are required for a citizen in order to access and interact with Government systems and the society	Compliance			
		Requirements	Indicator	Yes	No
<b>e-Literacy</b>	MPSAs shall equip citizens with ICT literacy skills, knowledge and competencies to access e-services in an ICT-driven knowledge society.				
<b>e-Citizen</b>	MPSAs shall equip the citizens with knowledge and competencies in using Internet-based tools for communication available electronic services and skills on searching for, accessing and using information from the Internet.				
<b>Government of the Republic of Zambia</b>	MPSAs shall equip the citizens with knowledge and competencies in using GRZ e-Services- access, <b>Zambia e-Service</b> communication and performing transactions with Government systems.				
<b>ICT Security</b>	MPSAs shall conduct awareness to citizens on the basics of; ICT security, confidentiality, integrity, authentication, identification, authorization, availability and access control.				
<b>E-services sensitization Awareness</b>	MPSAs shall implement strategies/programmes and <b>and</b> policies for creating awareness on the role of information and ICT for the improvement of quality of life and national development.				
<b>e-Learning on e-services</b>	MPSAs shall implement citizen electronic education platforms for e-services.				
<b>Competency surveys</b>	MPSAs shall conduct competency surveys to determine the level of ICT literacy and adoption by the citizens.				





