THE UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE, PUBLIC SERVICE MANAGEMENT AND GOOD GOVERNANCE
e-GOVERNMENT AUTHORITY

Document Title

Government Hardware and Software Specifications

Document Number

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APPROVAL	Name	Job Title/ Role	Signature	Date
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PREFACE

The rapid growth of ICT has changed to a large extent operation of the Government and society at large. This growth has enhanced diverse usage of hardware platforms and software applications as necessary tools for improved service delivery to citizens. In the quest of reaping benefits brought by the growth of ICT, the Government needs more sophisticated approach to enhance coordinated adoptions of ICT within its institutions.

In that regard, it was apparent for enactment of the e-Government Act No. 10 of 2019 and its Regulations, 2020, which provide guidance on proper approach for implementing e-Government and establishment of e-Government Authority with mandate of coordinating, promoting and overseeing e-Government implementations as well as enforcing compliance with laws, regulations, standards and guidelines related to e-Government implementations in Public Institutions.

In this context, Section 5(2) (d) and 26 (1) (a) of the Act empowers e-Government Authority to approve software and hardware to be used by public institutions in a manner that facilitates proper utilization and management of the Government owned ICT resources. Pursuant to these provisions, the Authority has prepared this document to prescribe minimum specifications for hardware and software to be used in the Government.

Dr. Musa M. Kissaka

BOARD CHAIRPERSON

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1. INTRODUCTION

1.1 Overview

e-Government Authority also known as "e-GA" is a public institution by the e-Government Act No. 10 of 2019. The Authority is mandated to Coordinate, Oversee and Promote e-Government initiatives and Enforce e-Government related Policies, Laws, Regulations, Standards and Guidelines in Public Institutions. The Act empowers e-GA to effectively formulate, manage and enforce Public Institutions compliance with e-Government standards and guidelines.

The e-Government Act calls upon the Authority to prepare Government acquisition of ICT resources specification guide. Therefore, the Authority has prepared hardware and software specifications guide to be adhered to by public institutions. These specifications will be valid for six months after being signed by the Director General. The specifications should be complied at the time of procurement.

1.2 Purpose

This document provides minimum specifications for hardware and software for the purpose of proper utilization and management of Government owned ICT resources.

1.3 Rationale

Section 5(2) (d) and 26 (1) (a) of the Act empowers e-Government Authority to approve software and hardware to be used by public institutions in a manner that facilitates proper utilization and management of the Government owned ICT resources. Pursuant to these provisions, the Authority has prepared this document to prescribe minimum specifications for hardware and software to be used in the Government.

Hardware and software specifications describe minimum requirements to be fulfilled by given hardware or software. The specifications will guide public institutions to observe value for money, flexibility, scalability, integration and interoperability in

sourcing or using hardware and software following the guidance provided on the recommended specifications.

1.4 Scope

This document will be used by all Public Institutions during the sourcing or using hardware and software.

2. SPECIFICATIONS

2.1 Hardware Specifications

2.1.1 Workstation Specifications

a. Public institutions shall ensure that the acquired desktop or laptop is not supplied readily installed with OS or Office application from the hardware manufacturer, instead the application installation is to be done by the internal ICT team to minimize potential security risks associated with readily installed applications.

b. In case the acquired desktop or laptop can only be supplied with readily installed associated applications and the business environment necessitate the use of such desktop or laptop then the public institution shall seek for approval from the Authority.

2.1.1.1 Technical Staffs

a. Laptops for Technical Directors and Managers

Features	Minimum Specifications
Processor	Intel(R) Core (TM) i7 or above
Memory	RAM - Minimum 8 GB or above
Display	Screen Size: 13" or above. Preferred Laptop/ Tablet Model. Touchscreen: Yes
Operating Systems	-Windows 10 (64bit) or later -Linux

	-Mac
Internal Storage	SSD HDD - 500GB or above
Communications/Wireless support	LAN: 10/100/1000 Ethernet NIC WLAN: 802.11ac Wireless LAN Bluetooth: Yes USB 3.0 Connectivity Mobile Broadband Module (*recommended*)
Input Device:	Keyboard: Illuminated Backlit, spill-resistant keyboard with drain. Webcam: Yes
Supplemental Items	Thickness: 11-15mm Docking connector Stereo headphone/microphone combo CD/DVD, R/RW Drive: Internal or External CDs for Drivers Leather Case Mouse
Power	Primary Battery: 6-cell or above long-life battery. Secondary Battery: 6-cell or above long-life Battery

NB: (Minimum Warranty of 12months).

b. Laptops for Technical Staffs

Features	Specification
Processor	Intel(R) Core (TM) i7 or above
Memory	RAM - Minimum 16GB or above
Display	Screen Size: 14" or above.
Operating Systems	-Windows 10 (64bit) or later -Linux
Internal Storage	HDD - 750 GB or above
Communications/Wireless Support	LAN: 10/100/1000 Ethernet NIC or latest WLAN: 802.11ac Wireless LAN or latest Bluetooth: Yes USB 3.0 Connectivity Mobile Broadband Module (*recommended*)

Input Device:	Keyboard: Illuminated Backlit, spill-resistant keyboard with drain. Webcam: Yes
Supplemental Items	Graphics Card Brand NVIDIA Stereo headphone/microphone combo CD/DVD, R/RW Drive: Internal or External CDs for Drivers Leather Case Mouse
Power	Primary Battery: 6-cell long life battery or above.
NB: (Minimum Warranty of 12months).	

c. Desktops Computers for Technical Staffs

Features	Specification
Processor	Intel(R) Core (TM) i7 or above
Processor Speed	At least 3.0GHZ
Memory	RAM at Least 16GB or Above
Display	HDMI or DVI support
Operating Systems	-Supports Windows 10 or above (64bit). -Supports Linux
Hard Drive	750GB or Above
Video Card	Intel® Integrated Graphic
Monitor/LCD	27" Monitor flat panel LCD
Ports	At least 6 USB 2.0 or 3.0 standard serial port, 1 parallel port, 1, 1 VGA Port, Audio in/out,
Keyboard	USB standard Keyboard
Pointing Device	USB Optical scroll mouse
Connectivity	Integrated Gigabit Ethernet, 802.11b/g/n Wireless Interface
Others	Built in Speakers
CD/DVD, R/RW Combo Drive	Internal
NB: (Minimum Warranty of 12months).	

2.1.1.2   Non-Technical Staffs

a. Laptops for Non-Technical Directors and Managers

Features	Specification
Processor	Intel(R) Core(TM) i7 or above
Memory	RAM - Minimum 8 GB or above
Display	Screen Size: 13" or above. Preferred Laptop/ Tablet Model. Touchscreen: Yes
Operating Systems	Windows 10 (64bit)
Internal Storage	SSD HDD - 500GB or above.
Communications/Wireless Support	LAN: 10/100/1000 Ethernet NIC WLAN: 802.11ac Wireless LAN Bluetooth: Yes USB 3.0 Connectivity Mobile Broadband Module (recommended)
Input Device:	Keyboard: Illuminated Backlit, spill-resistant keyboard with drain. Webcam: Yes
Supplemental Items	Thickness: 11-15mm Docking connector Stereo headphone/microphone combo CD/DVD, R/RW Drive: Internal or External CDs for Drivers Leather Case Mouse
Power	Primary Battery: 6-cell or above long life battery. Secondary Battery: 6-cell or above long life Battery
NB: (Minimum Warranty of 12months).	

b. Laptops for Non-Technical Staffs

Features	Specification
Processor	Intel(R) Core(TM) i7 or above
Memory	RAM - Minimum 8 GB or above

Display	Screen Size: 14" or above.
Operating Systems	Windows 10 (64bit)
Internal Storage	HDD - 400 GB or above
Communications/Wireless Support	LAN: 10/100/1000 Ethernet NIC or latest WLAN: 802.11ac Wireless LAN or latest Bluetooth: Yes USB 3.0 Connectivity; 2 Slots or more. Mobile Broadband Module (*recommended*)
Input Device:	Keyboard: Illuminated Backlit, spill-resistant keyboard with drain. Webcam: Yes
Supplemental Items	Graphics Card - Brand NVIDIA (128 MB or better business class) Stereo headphone/microphone combo CD/DVD, R/RW Drive: Internal or External CDs for Drivers Leather Case Mouse
Power	Primary Battery: 6-cell long life battery or above.
NB: (Minimum Warranty of 12months).	

c. Desktops Computers for Non-Technical Staffs

Features	Specification
Processor	Intel(R) Core (TM) i5 or above
Memory	RAM at Least 8GB or Above
Display	HDMI or DVI support
Operating Systems	-Supports Windows 10 above (64bit). -Supports Linux
Hard Drive	500GB or Above
Video Card	Intel® Integrated Graphic
Monitor	24" Monitor or above
Ports	At least 6 USB 2.0 or 3.0 standard serial port, 1 parallel port, 1, 1 VGA Port, Audio in/out,
Keyboard	USB standard Keyboard

Pointing Device	USB Optical scroll mouse
Connectivity	Integrated Gigabit Ethernet, 802.11b/g/n Wireless Interface
Others	Built in Speakers
CD/DVD, R/RW Combo Drive	Internal
NB: (Minimum Warranty of 12months).	

2.1.2 UPS Specification

Features	Specification
Output Power	1KVA or above
Nominal Output Voltage	230v
Efficiency at Full Load	at least 97%
Output Frequency	50/60Hz auto-sensing
Synchronization Range	± 3Hz
Other output Voltages	220, 240
Output Voltage Note	Configurable for 220, 230 or 240 nominal output voltage
NB: (Minimum Warranty of 12months).	

2.1.3 Panache My Air PC

Features	Specification
Processor	Intel Z3735F processor (Quad core 1.33GHz)
Memory	2GB DDR3L or above
Storage	eMMC 32GB
Expandable storage	Micro SD card slot support upto 128GB
Display	HBMI male connector
Wifi	802.11 b/g/n
Bluetooth	Bluetooth 4.0
Ports	USB 2.0 * 1, microUSB * 1
Power button	Yes
Adopter	10W (5V/2A)
Power input	Microsoft USB connector for power input
Operating system	Microsoft windows 10
Accessories	OTG Cable
Dimension	110.9mm * 38mm * 9.8mm
weight	46 grams
NB: (Minimum Warranty of 12months).	

2.1.4 Digital signature display

Features	Specification
Panel	- Screen size : atleast 75" - Panel technology: IPS - Lifetime (Typ.): 50,000Hrs - Operation hours (hours/days): 24/7 specialized display - Portrait/landscape: Yes/Yes - Built In speakers: No
Connectivity	- RS232C IN: yes (3.5 mm stereo Jack) - RJ45 (LAN): Yes - IR IN: yes - USD: yes (2.0 Type A) - Display port: yes (input DP/HDMI) - External speaker out: Yes (L/R 10W + 10W) - RS232C out: yes
Mechanical	- Handle/stand: Yes/Yes
Hardware features	- Internal memory: 16 GB - Built in WIFI: Yes
Power	- Power type: built in power
Software features	- Software content management: Yes - Embedded CMS Local content scheduling: Yes - Embedded CMS group manager: Yes - USB plug & play: Yes - Play via URL: Yes - Smart energy saving: Yes
Other	- Basic accessories: remote controller, power cord, HDMI cable, manual, (EIG, IG), IR receiver, RS232C adopter and IR sheet - Other accessories: support for other mini computers that use HDMI ports. - Installation accessories: Wallmount (landscape and portrait)
NB: (Minimum Warranty of 12months	

2.1.5 Server Specifications

Features	Minimum Specification
Processor Speed	latest generation intel processor, 6 cores @2.3Ghz, Must support Hyper Threading
Memory (RAM)	16GB
Expansion Slots	PCIe 3.0
Internal Storage Capacity	Supported drivers: 8 SFF hot-plug drive model with Universal Media Bay Configuration: Hot plug SFF SAS/SATA hot plug SFF Hard Disk Drive: 2 x 600GB Hot Plug SFF HDD
Network Controller	Embedded 4x1GbE Network Adapter
Storage controller	Embedded SATA Controller, (1) Smart Array with cache memory; RAID Controllers with RAID 0/1/1+0/5/50/6/60/1
Display/Graphics	17" TFT Flat Panel LCD, same brand as CPU
Interfaces	1 Serial
	1 Pointing Device (Mouse)
	1 VGA Graphics Adapter
	1 Keyboard
	1 External SCSI
	Dual Port PCI-X 1000T Gigabit Server Adapter (embedded)
	Four USB 3.0 (one internal)
Form Factor	Rack Mountable(2U),
Support software, and configuration utilities	Include Server managements manufacturers packs
Power Supply Unit	2 Redundant 500 W Power supply
	Input: 220 - 240 VAC
Operation System	No need for pre-installed operating system but the servers should support major OS including UNIX/LINUX/MS Windows.
Security Management	Remote Access Management Engine, Insight Control, UEFI System Utilities Support with Enterprise license Chassis intrusion detection option, configurable for PCI DSS compliance, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, Bezel Locking kit, Tamper-free updates - components digitally signed and verified Secure Recovery - recover critical firmware to known

	good state on detection of compromised firmware, Ability to rollback firmware.
Optical drive type	SATA DVD-RW
Fans	Redundant hot-plug system fans
Warranty	3/3/3 years of parts, labor, onsite support with next business day response
Other Features	Multi-port connectivity, Standard Rail Kit, Cable manager

2.1.6 Network Devices Specifications

2.1.6.1 Wireless Access Points

No.	Feature Description	Minimum Specification
1	Modules	Provides full-spectrum scanning for, wIPS for comprehensive detection and mitigation of over the network attacks, Clean Air technology detecting devices causing network interference, rogue device detection, context (location) awareness, and radio resource management (RRM) solutions Provides full scanning of all 2.4- and 5-GHz channels while the Access Point is serving data clients on the integrated radios.
2	802.11n version 2.0 (and related) capabilities	4x4 MIMO with three spatial streams Maximal ratio combining (MRC) 802.11n and 802.11a/g beamforming 20- and 40-MHz channels PHY data rates up to 450 Mbps (40 MHz with 5 GHz) Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) Cyclic shift diversity (CSD) support
3	802.11ac Wave 1 capabilities	4x4 MIMO with three spatial streams MRC 802.11ac beamforming 20-, 40-, and 80-MHz channels PHY data rates up to 1.3 Gbps (80 MHz with 5 GHz) Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx)

		802.11 DFS CSD support
4	Data rates supported	802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps 802.11n on 2.4 GHz: 6.5 to 216.7 Mbps depending on GI and MCS
5	Integrated antenna	2.4 GHz, gain 4 dBi, internal Omni, horizontal beamwidth 360° 5 GHz, gain 4 dBi, internal Omni, horizontal beamwidth 360°
6	External antenna (Must be included)	Omni, Gains up to 6 dBi (2.4 GHz and 5 GHz)
7	Built-in/Included Interfaces	10/100/1000BASE-T autosensing (RJ-45) Management console port (RJ-45)
8	Dimensions (W x L x H)	Access point (without mounting bracket): 8.7 x 8.7 x 2.11 in. (22.1 x 22.1 x 5.4 cm)
9	Operating Environment	Non-operating (storage) temperature: -22° to 158°F (-30° to 70°C) Non-operating (storage) altitude test: 25°C, 15,000 ft. Operating temperature: -4° to 122°F (-20° to 50°C) Operating humidity: 10% to 90% (noncondensing) Operating altitude test: 40°C, 9843 ft
10	Indicators	Status LED indicates boot loader status, association status, operating status, boot loader warnings, boot loader errors
	System Memory	512 MB DRAM or above 64 MB flash or above
11	Warranty	Limited lifetime hardware warranty
12	Compatibility	Must be compatible with Supplied WLAN Controllers
13	Compliance /Standards	UL 60950-1 CAN/CSA-C22.2 No. 60950-1 UL 2043 IEC 60950-1 EN 60950-1 EN 50155 Class III equipment
14	Security	802.11i, Wi-Fi Protected Access 2 (WPA2), WPA

		◦ 802.1X ◦ Advanced Encryption Standard (AES) ◦ Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP)
15	Extensible Authentication Protocol (EAP) types:	EAP-Transport Layer Security (TLS) ◦ EAP-Tunneled TLS (TTLS) or Microsoft Challenge Handshake Authentication Protocol Version 2 (MSCHAPv2) ◦ Protected EAP (PEAP) v0 or EAP-MSCHAPv2 ◦ EAP-Flexible Authentication via Secure Tunneling (EAP-FAST) ◦ PEAP v1 or EAP-Generic Token Card (GTC) ◦ EAP-Subscriber Identity Module (SIM)

2.1.6.2 Aggregation Services Router Specification

i.   1GB DRAM, but supports maximum 4GB DRAM

ii. 8 slots, (Each embedded module has 8 optical ports with 1GE interface)

iii. Rack height: 6RU

iv. Up to 100Gbps throughput

v.   Redundant AC and DC Power Supply

vi. Redundant route processors and ESPs

vii. Supports Multiprotocol Label Switching (MPLS) network infrastructure

2.1.6.3 Edge Routers

Features	Specification
Performance	Switching Capacity – at least 1.92Tbps Per-slot switching capacity: 480 Gbps
Physical Specifications	Dimensions (W X H X D) – (17.45 x 8.71 x 24.5) in (44.3 x 22.1 x 62.2)cm Weight fully loaded 130lb /59 kg Weight unloaded 52lbs/23.6 kg
Routing Engine	2 x 16 MB NOR flash storage 64GB of DDR4 RAM 2 X 50GB SSD

	Number Of Cores – Six (6)
Redundancy Components	Power Supplies Fans Routing Engines (RE)
Resiliency	Redundant REs Unified ISSU Nonstop active routing (NSR) Fast restoration Operation, Administration, and Maintenance (OAM)
Routing Protocols	BGP GRE MPLS OSPF & OSPFv3
Features/Functionalities	Firewall protection DHCP support NAT support VPN support IPv6 support High Availability Quality of Service (QoS) MPLS VPN Virtual Chassis technology IPv4 support Virtual Routing and Forwarding (VRF)
Inline Services	GRE reassembly 1:1 NAT Flow monitoring Video monitoring Lawful intercept Mirroring
Security	Firewall filters/ACLs DDoS—control plane DDoS—Flow Spec Stateless filters L2-L4 Stateful services

Service Card Supported Services	Deep packet inspection
CGNAT
Flow monitoring
Traffic load balancing
IPsec
Stateful firewall
HTTP header manipulation
System Virtualization	Enhanced SLA and queuing
Logical systems
Virtual router/ switch
Path Computation Element Protocol (PCEP)
OpenConfig
YANG data modeling

2.1.6.4 Firewall Devices

Features	Specification
Physical interfaces	Ethernet ports – at least two (2) 1Ge ports of RJ 45
I/O Ports - 2 x USB 2.0, 1x Micro-USB, 1x COM (RJ 45), 1 HDMI
Power Supply	Connectivity modules (optional) – SFP Transceivers
Layer 2 Supports	Supports for VLAN configurations.
Zone segmentation
Layer 3 features	Static Routing and Dynamic Routing (OSPF, BGP, RIP etc)
Network Address translation (NAT), DHCP, IP Address and Gateways configurations.
Traffic Load balancing.
Security	Access Rules and NAT rules,
Threat protection capability
IPS capability (Optional)
Performance	High Firewall throughput
Concurrent Connections – At least 1,000,000
New Connections Per second – At least 20,000
IPsec VPN throughput – At least 1,000Mbps
SSL Concurrent Connections – At least 5,000
Warrant and Support	3 years warrant and support for hardware and supporting license software

2.1.6.5 Switches

Features	Specification
Connectors	24 GbE and 4 SFP
Power over Ethernet Ports	24 PoE, up to 370W
Forwarding Bandwidth	52 Gbps
Switching Bandwidth	104 Gbps
Forwarding Rate	52 Gbps
DRAM	2GB
Flash	2GB
Power	40.32W
Weight	2.98kg, 6.57lb
Rackmount Options	1U Rack mountable
Fans	Fixed redundant
Warranty and support	Minimum 12 months

2.1.7 Biometric Devices Specifications

i. Support the latest version of Android.

ii. Support multiple connectivity options for communicating with the BAS server i.e. Ethernet, PoE capability, USB, GPRS, Wi-Fi (802.11 b/g/n) and Mobile Broadband 3G/4G;

iii. Supports Fingerprint, RF card, PIN and Facial;

iv. Wall Mountable;

v. Backup battery that can stay for more than 6 hours;

vi. Provide APIs with lifetime license and Software Development Kit (SDK) to enable communication with the web server;

vii. Support SSL VPN;

viii. Higher capacity for managing multiple users and events;

ix. Customized sign-in and sign-out buttons on the biometric device interface;

x. RAM capacity: at least 4GB;

xi. Storage: HDD at least 8GB;

xii. Support storage and computation of image (fingerprint) in various format including WSQ format;

xiii. Display: 7-inch color screen;

xiv. At least Quad core 1.5 GHz;

xv. Fingerprint sensor: 500ppi optical sensor;

xvi. Grayscale: 256 levels

xvii. Sensing area: 15.2 x 20.3 mm

xviii. Platen size=20 x 33 mm (0.8" x 1.3") or Optical scanning area 24.4 mm x 16.3 mm

xix. At least template matching speed (fingerprints per second): 3000

xx. Identification Speed: Less 0.5 sec

xxi. Operating Temperature: 0 - 45 Degree Celsius

xxii. Image Capture Surface 15—18(mm)

xxiii. False Acceptance Rate (FAR) :0.0001%

xxiv. False Rejection Rate (FRR): 0.1%

2.1.8 Laser jet Printer Specifications

Features	Specification
Print Quality	1200 x 1200 dpi
Print Speed and throughput	Up to 45ppm black
Print technology	Laser black
Memory	80MB or higher, expandable
Memory slots	2 x100 –pin DDR DIMM
Processor Speed	At least 540Mhz
First page out	Less than 8 sec
Languages	PCL 5e,PCL 6, Postscript 3 emulation
Media Capacity	100 multipurpose tray 500-sheet input trays
1 manual feeding tray including envelopes, labels, transparencies and special media Output tray up to 300 sheets	
Media Sizes	Letter,legal,executive,A4and A3
Media types	Plain paper, envelopes, transparencies, copier, bond (60 to 200 g/m2)
Duplex printing	Automatic (standard)

Connectivity	IEEE-1284 compliant bi-directional parallel port and/or Universal Serial Bus (USB), Gigabit Ethernet
RJ 45 Ethernet port	
Hard disk	20Gb
Duty cycle	200,000 per month
Network	Yes (Standard)
Compatibility	Smart switch printer language sensing
Software	Drivers for windows server 2012/2016, Windows 10, Macintosh, Linux

2.1.9 Color Laser jet Printer Specifications

Features	Specification
Print speed, black (best quality mode)	31ppm
Print speed, black (normal quality mode)	31ppm
First page out (black)	As fast as 10 sec
First page out (color)	As fast as 10 sec
Monthly duty cycle	Up to 100,000 pages
Print resolution, black	Up to 600 x 600 dpi
Print resolution, color	Up to 600 x 600 dpi
Ink cartridges	4 (1 each black, cyan, magenta, yellow); all preinstalled
Paper tray(s), minimum	3
Memory	256MB
Duplex Printing	Automatic
Processor speed	At least 533MHz
Print languages, standard	PCL 6, PCL 5c, postscript level 3 emulation
Maximum Input capacity	Up to 1100 sheets
Connectivity	High Speed USB 2.0 , Gigabit Ethernet
Two enhanced input/output (EIO slots)	
Gigabit Ethernet Print Server	
Compatible operating systems	Macintosh, Windows 10; Windows Server 2012/2016 (32/64 bit); Linux.
Software included	Print drivers and installation software on CD-ROM, PCL6, PostScript Level 3 emulation

2.1.10   Production Scanner Specifications

Features	Specification
Recommended Daily Volume	Unlimited
Throughput Speeds	Up to 200 pages per minute/800 images per minute (Throughput speeds may vary depending on your choice of driver, application software, operating system and PC.) (200 dpi landscape, letter-size document)
Scanning Technology	Dual Tricolor Plus CCD; Grayscale output bit depth is 256 levels (8-bit); Color capture bit depth is 40-bit (10 bits per red, green, blue and black channels); Color output bit depth is 24-bit
Optical resolution	300 dpi
Illumination	Dual Xenon lamps per side, mercury-free
Output resolution	Black and white: 200/240/300/400 dpi; Color/grayscale: 100/150/200/240/300 dpi
Maximum Document Size	305 mm x 863 mm (12 in. x 34 in.)
Minimum Document Size	64 mm x 64 mm (2.5 in. x 2.5 in.)
Paper Thickness and Weight	With standard feeder: 45 g/m² (12 lb) bond to 200 g/m² (110lb) index; With ultra-lightweight feeder: 25 g/m² (7 lb) rice paper to 75 g/m² (20 lb) bond
Feeder	500-sheet
Multi-feed Detection	Multi-feed detection with ultrasonic technology; three ultrasonic sensors that can work together or independently
Connectivity	IEEE-1394 (FireWire) interface, 6-pin connector; IEEE-1394 card and cable included
Interface Support	TWAIN and ISIS Drivers (included); KODAK Capture Software
Color Touch Screen Control	Operator control via color LCD touch screen
Ergonomic Height Adjustment	Integrated height adjustment span of 25 cm (10 in.) for seated or standing operation
Imaging Features	Perfect Page Scanning, i Thresholding, auto crop, aggressive crop, deskew, image rotation, electronic color dropout,

Features	Specification
	dual stream scanning, halftone removal, noise removal, zone processing, toggle patch, automatic color detection, automatic orientation
On-board Compression	CCITT Group IV, JPEG or uncompressed output
File Format Outputs	JPEG (for color and grayscale images); TIFF (for black and white images)
Image Address	Multi-level indexing/batching capabilities
Patch Readers	Four permanently mounted patch readers that can work together or independently
Imprinting	Front pre-scan or rear post-scan imprinting; optional hi-res imprinter available
Electrical Requirements	100-130 VAC, 50/60 Hz, 7 A; 200-240 VAC, 50/60 Hz, 3.5 A
Minimum PC Configuration	Pentium 4 2.4 GHz processor with 512 MB RAM
Supported Operating Systems	Windows 10 (32 and 64 bit), Macintosh, Linux

2.1.11　Departmental Scanner Specifications

Features	Specification
Recommended Daily Volume	Up to 9,000 pages per day
Throughput Speeds	Up to 45 pages per minute/90 images per minute *(200 dpi, landscape, letter size, black and white/grayscale/color)
Scanning Technology	dual CCD Grayscale output bit depth is 256 levels (8-bit) Color capture bit depth is 48 bits (16 x 3) Color output bit depth is 24 bits (8 x 3)
Output resolution	75, 100, 150, 200, 240, 300, 400, 600 and 1200 dpi
Maximum Document Size	297 mm x 863 mm (11.7 in. x 34 in.)
Minimum Document Size	64 mm x 89 mm (2.5 in. x 3.5 in.)
Paper Thickness and Weight	34–413 g/m² (9–110 lb.) paper
Feeder	Up to 150 sheets of 60 g/m² (16 lb.) paper
Multi-feed Detection	With ultrasonic technology
Connectivity	USB 2.0, Gigabit Ethernet

Features	Specification
Bundled Software	TWAIN, ISIS, SANE and Windows Imaging Architecture Drivers, KODAK Capture Desktop Software and Smart Touch
Imaging Features	Perfect Page Scanning; Thresholding; adaptive threshold processing; deskew; auto crop; relative cropping; aggressive cropping; electronic color dropout; dual stream scanning; interactive color, brightness and contrast adjustment; automatic orientation, automatic color detection, background color smoothing
File Format Outputs	Single and multi-page TIFF, JPEG, RTF, PDF, searchable PDF
Accessories	KODAK Imaging Guide Wiper Accessory Optional A4 black imaging background accessory
Electrical Requirements	100-240 V (International); 50/60 Hz; universal power supply included
Recommended PC Configuration	For documents up to 356 mm (14 in.) long at 400 dpi: Dual core, 3.2 GHz processor, 2GB RAM; For documents up to 660 mm (26 in.) long at 400 dpi: Dual Core, 3.2 GHz processor, 2 GB RAM; For longer documents/higher resolutions: Dual core, 3.2 GHz processor, 4 GB RAM
Supported Operating Systems	Windows 10 (32 and 64 bit), Macintosh, Linux

2.1.12   Workgroup Scanner Specifications

Features	Specification
Recommended Daily Volume	Up to 3,000 pages per day
Scanning Technology	Single CCD; i1220 Plus: Dual CCD; Grayscale output bit depth is 256 levels (8 bits); Color capture bit depth is 48 bits (16 x 3); Color output bit depth is 24 bits (8 x 3)
Throughput Speeds (portrait, letter size)	Bitonal/grayscale: Up to 45 pages per minute at 200 dpi Color: Up to 30 pages per minute at 200 dpi and 300 dpi (Throughput speeds may vary depending on your choice of driver,

	application software, operating system and PC.)
Optical resolution	600 dpi (1200 dpi A4 flatbed accessory)
Illumination	Dual fluorescent (cold cathode)
Output resolution	75, 100, 150, 200, 240, 300, 400, 600 and 1200 dpi
Max./Min. Document Size	215 mm x 863 mm (8.5 in. x 34 in.)/50 mm x 63.5 mm (2 in. x 2.5 in.)
Paper Thickness and Weight	34-413 g/m² (9-110 lb.) paper; ID card thickness: up to 1.25 mm (0.05 in.)
Feeder	Up to 75 sheets of 75 g/m² (20 lb.) paper Handles small documents, such as ID cards, embossed cards and insurance cards
Multi-feed Detection	With ultrasonic technology
Connectivity	USB 2.0 (cable included)
Bundled Software	TWAIN, ISIS, WIA Drivers; KODAK Capture Desktop Software, Smart Touch; Nuance ScanSoft PaperPort and OmniPage.
Imaging Features	Perfect Page Scanning; iThresholding; adaptive threshold processing; deskew; autocrop; relative cropping; aggressive cropping; electronic color dropout; dual stream scanning; interactive color, brightness and contrast adjustment; automatic orientation; automatic color detection; background color smoothing; image edge fill; image merge; content based blank page detection; streak filtering; image hole fill; sharpness filter
File Format Outputs	Single and multi-page TIFF, JPEG, RTF, BMP, PDF, searchable PDF
Recommended PC Configuration	For documents up to 660 mm (26 in.) long at 400 dpi: Duo Core Processor with 2 GHz or equivalent and 2 GB RAM
	For longer documents/higher resolutions: Duo Core Processor or equivalent with 2 GHz and 4 GB RAM.

	Note: for optimal performance when using a PC running the Windows 7 operating system, at least 3 GB RAM is recommended.
Supported Operating Systems	Windows 10 (32 and 64 bit), Macintosh, Linux

2.1.13   Fax Specifications

Features	Specification
Modem Speed	Up to 33.6Kbps
Fax Resolution	Up to 200 x 400dpi
Compression Modes	MH, MR, MMR
Memory Capacity	Up to 512 pages
One-Touch Dial	30 dials
Speed Dial (One Touch + Coded dials)	Up to 130 dials
Group Dials / Destinations	Max. 129 dials / Max. 129 destinations
Sequential Broadcast	Max. 140 destinations
Receive Mode	Fax only, Manual, Answering, Fax / Tel Auto switch
Memory Backup	Yes, 5 minutes
FAX Features	Fax Forwarding, Dual Access, Remote Reception, PC Fax (TX only), DRPD, ECM, Auto Redial, Fax Activity Reports, Fax Activity Result Reports, Fax Activity Management Reports

2.1.14   Photocopier

Features	Specification
Printing technology	A4 Laser
Processing feature	Powerful file processing and job management
Standard memory	2GB RAM
Interface	Network interface and USB
Supporting OS	Print from windows, MAC OS X and Linus
Copy speed (normal)	Up to 21 cpm
Warranty	12 months

2.1.15   Heavy duty printer

Features	Specification
Functions	Print/Scan/Copy/Fax
General type	B/W Multifunctional for A4/A3 format
Engine speed Memory:	25 ppm B&W Minimum: 1 GB RAM
Hard Disk Drive (Optional)	HD-6 (32 GB SSD)
Electrical Requirements	220-240V
First page out Time (print/copy)	As fast as 5.8 Seconds B&W
Resolution	600 x 600 dpi ; Fine 1200
Print Technology	Laser MFP
Display	4.3″ touchscreen Color Graphic Display (CGD)
Maximum Monthly Duty Cycle	80,000 Pages Per Month
Input Capacity (std)	600 Sheets
Output Capacity (std)	250 Sheets
Paper Sources (std)	Minimum: 1 Tray + 1 MPT
Input Materials	Plain Paper, Recycled, Thick, Thin
Standard Interface	10/100/1000BaseTX, Hi-Speed USB 2.0, USB Host Interfaces, Expansion Slots
Security	password-protection, secure browsing via SSL/TLS; IPsec; LDAP authentication and authorization; SNMPv3
Operating System Support	All current Windows operating systems MAC OS X Version 10.5 or higher Unix, Linux as well as other operating systems on request.

Paper handling input	250-sheet input tray, 50-sheet Automatic Document Feeder (ADF)
Paper handling output	Standard 150-sheet output bin
Duplex printing	Automatic (standard)
Duplex ADF scanning	Yes, single-pass duplexing ADF
Copy speed (normal)	Up to 21 cpm
Fax	Yes
Power	220-volt input voltage
Maximum Weight	8Kg
Office Machine Features	Save to USB flash drive, scan to e-mail Max Document Enlargement 400 % Max Document Reduction 25 % Automatic Duplexing ENERGY STAR Certified
Other Accessories	Document Feeder Printer stand
Warranty	12 months

2.1.16   IP Phone Specifications

Features	Specification
Protocols and Standards	• SIP RFC3261 • TCP/IP/UDP • RTP/RTCP • HTTP/HTTPS • ARP/RARP • ICMP • DNS (A record, SRV, NAPTR) • DHCP • PPPoE • TELNET • TFTP • NTP

	• STUN • SIMPLE • TR-069 • 802.1x
Network Interfaces	• Dual switched 10/100Mbps ports • Integrated PoE (Power-over-Ethernet)
Graphic Display	• 128 x 40 graphical LCD display
Feature Keys	• 2 line keys with dual-color LED and 1 SIP account • 3 XML programmable context sensitive soft keys • 5 navigation/menu/volume keys • 8 dedicated function keys for Hold, Transfer, Conference, Volume, Headset, Mute, Speakerphone, Send/Redial
Voice Codec	• Support for G.723.1, G.729A/B, G.711µ/a, G.726-32, G.722 (wide-band), iLBC, in-band and out-of-band DTMF (in audio, RFC2833, SIP INFO)
Telephony Features	• Hold • Transfer • Forward • 3-way conference • Call park • Pickup • Shared-call-appearance (SCA)/Bridged-line-appearance (BLA) • Downloadable phone book (XML, LDAP, up to 500 items) • Call waiting • Call log (up to 200 records) • Off-hook auto dial • Auto answer • Click-to-dial • Flexible dial plan • Hot desking

	• Personalized music ringtones • Server redundancy • Fail-over
HD Audio	• Yes, HD handset with support for wideband audio
Headset Jack	• RJ9 headset jack
Base Stand	• Yes, 2 angle positions available
Wall Mountable	• Yes
QoS	• Layer 2 (802.1Q, 802.1p) • Layer 3 (ToS, DiffServ, MPLS) QoS
Security	• User and administrator level passwords • MD5 and MD5-sess based authentication • AES encrypted configuration file • SRTP • TLS • 802.1x media access control
Multi-language	• English, German, Italian, French, Spanish, Portuguese, Russian, Croatian, simplified and traditional Chinese, Korean, Japanese etc.
Upgrades and Provisioning	• Firmware upgrade via TFTP/HTTP/HTTPS • Mass provisioning using TR-069 or AES encrypted XML configuration file
Power & Green Energy Efficiency	• Universal power adapter: Input: 100-240VAC 50-60Hz; Output: +5VDC • 800mA Integrated Power-over-Ethernet (802.3af) • Max power consumption: 2.5W (power adapter) or 3W (PoE)
Physical	• Dimensions: 186mm (W) x 210mm (L) x 81mm (D) Unit • Weight: 0.7kg • Package weight: 1.0kg
Temperature and Humidity	• 32-1047°F / 0-40°C

	• 10-90% (non-condensing)
Compliance	• FCC Part 15 (CFR 47) Class B
	• EN55022 Class B
	• EN55024
	• EN61000-3-2
	• EN61000-3-3
	• EN 60950-1 AS/NZS CISPR 22 Class B
	• AS/NZS CISPR 24
	• RoHS UL 60950 (power adapter)

2.1.17   PBX Specifications

Features	Specification
PBX Capacity	1 or 3 Outside CO Line, 8 Extensions
	Non-expandable
Power Supply	220VAC or 110VAC/50Hz 10%
Max. Consumption	...< 20W
Cross-tone Lose	> 70dB
Temperature	0 45 C
Humidity	10%— 95 %
Intercom Ringing	7SVAC/ 50Hz
External MOH	input 600 Q, output 0.25-1Vpp
Inside Feed Voltage	48VDC,20 30mA
CO Port Voltage	Lc 60VDC
Regular Phone	Lc 1000m cable length
Toll Restrict Level	6
DISA	12Sec.,1-Level, channel
000 Phone opener	4-Jan
Conference Party	3 party
Extension Number	3-Digit only, 100-999
Power Fail Port	2
Operator	2
Flash Time	300-2000ms
PSTN Access	Dial 0 out

2.2 Software Specifications

2.2.1 Applications

2.2.1.1 Business Specific Applications

These applications provide ICT enabled service capabilities of individual lines of business providing Government to Government (G2G), Government to Business (G2B) and Government to Citizen (G2C) services to the government, community and businesses and supporting the operational services of Public Institutions through electronic means. The following are things to consider:

   i.   The applications fulfill institutional business requirements
  ii.   Requirements are prepared from re-engineered business processes
 iii.   The consultant undertaking user requirements gathering should not be the vendor that is engaged to develop the same system.
  iv.   The acquired or developed applications are hosted on Government approved hosting facilities or in Government data centers.
   v.   The application should be endorsed by the Ministry responsible for that business process.

2.2.1.2 Generic Applications

a. Office Software

S/No	Software Type	Software Item	Details
1.	Word Processors, Spreadsheets, Presentation	- Microsoft Office - LibreOffice (Linux)	- MS Word, - MS Excel, - MS PowerPoint, - MS Access, - MS Publisher
2.	Internet Browser	- Microsoft Edge - Firefox Mozilla - Chrome - Opera - Safari	Including all security Patches
3.	Electronic Mail	- Government Mailing System (GMS)	Mailing system hosted in approved government infrastructure

4.	PDF Document	- Adobe Reader	Latest stable version.
5.	Virus Protection	- Anti-virus software available in the market	Latest stable version.
6.	Media and design tools	- Adobe Creative cloud	Latest stable version
7.	Video Conferencing	- E- Mikutano	- Hosted in-house or within other Government Infrastructure - The system shall not be able to record meetings proceedings - Adhere to technical guidelines for video conference systems in the Government developed by e-GA

b. Human Resource Management

Human resource management software enables the capabilities for the recruitment and management of government personnel including demographic, personal data, services relating to employee management from recruitment to retirement, appraisal, payroll, benefits, education and training among others.

S/No	Software Type	Software Item	Details
1.	Human Resource Management	- Human Capital Management Information System (HCMIS)	The software should be endorsed by the ministry responsible for Human resource i.e PO- PSMGG

c. Financial Management

Financial Management software provides capabilities for the accounting practices and procedures that allow for the handling of revenue, funding and expenditures. The financial management system should be able to provide services such as billing and accounting, payments and receipts, payroll, debt management, expense management, revenue management and bank reconciliation.

S/No	Software Type	Software Item	Details
1.	Financial Management	- GePG - MUSE - Enterprise Resource Management System (ERMS)	The financial software shall be approved by the Ministry of Finance and Planning.

d. Supply Chain Management

The Supply Chain software manages the flow of goods, suppliers' relationships, and controlling associated business processes such as procurement, sourcing, inventory, ordering, purchasing, invoicing, requisition tracking and approval, warehouse, logistics and transportation management of goods and services for Public Institutions.

S/No	Software Type	Software Item	Details
1.	Supply Chain Monitoring and Planning		- Supply chain monitoring tool should effectively oversee the movement of material and items through the company's supply chain.

			- The system should provide information such as shipment date and time, ID and order numbers, freight data and more to provide increased supply chain visibility. - The system should provide a centralized dashboard to oversee the operations, view procurements, manufacturing and logistics all in one place to gain a more contextual understanding of each process.
2.	Order Processing and Inventory Management		- The system should support some methods of inputting inventory data into the system such as using RFID tags or barcodes.
3.	Warehouse Management		- The system should help users deal with day to day warehouse work such as labor, materials, floor space and operational protocols.
4.	Transportation Management	- Fleet Management	- The system should be able to monitor shipments, allows to see issues in their early stages.
5.	Sourcing and Supply Management		- The system should help issues such as costs, contract management, supplier quality and other issues.

			- The system should help in establishing key tracking methodologies for supplies and materials.

e. Assets Management

Asset Management Software manages or tracks inventories, hardware equipment and software at all stages right from acquisition to disposal in order to make better provisions for the more effective management of public assets hence increase value for money.

S/No	Software Type	Software Item	Details
1.	Asset Management	-Government Asset Management Information System (GAMIS) -ERMS for managing assets within Institution and links with central system GAMIS	- The system should be able to scan asset labels. - The system should be able to do depreciation management. Depreciation is an accounting process through which an organization calculates the value of an asset that declines over time. - The system should perform license management - The system should allow software and hardware inventory - The system should be able to perform due date tracking.

f. ICT Management

ICT Management software enables the capabilities to support the administration and upkeep of a public institution's technology assets, including the hardware, software, infrastructure network, licenses and service components that comprise those assets.

S/No	Software Type	Software Item	Details
1.	Incident Management		The system should allow to send or provide notifications
2.	Problem Management		The system should allow to log all problems
3.	Configuration Management	- Rancid	- The system should allow configuration identification - The system should allow configuration change control - The system should allow configuration status accounting - The system should allow configuration audits
4.	Change Management		The system should be able to track all changes done.
5.	Release Management		The system should allow scheduling and control the movement of release
6.	Service Level Management		The system should be able to track the commitment between service provider and client.
7.	Monitoring	- SolarWinds - Nagios - Zabbix - eSight - Cacti	The system should be able to monitor all ICT assets of the institution.

8.	Security Management	- Radius - TACACS+ - QRadar - Security Onion - Nessus - Acunetix	- The system should be able to ensure availability, integrity and confidentiality of institutional information.

2.2.2 Operating Systems

Software Type	Software Item	Details
Operating System	- Unix/Linux - Microsoft Windows 10 - MacOS	(Ubuntu, CentOS, Suse, Linux Mint) (64bit)

2.2.3 Database Management Systems

Software Type	Software Item	Details
Database Management Systems (DBMS)	- Mysql - Postgres - Microsoft SQL - Mongo DB	Use currently supported versions

3. IMPLEMENTATION, REVIEW AND ENFORCEMENT

This document shall be:

3.1   Effective upon being signed by the Board Chairperson.

3.2   Subjected to review at least once every six months or whenever necessary changes are needed.

3.3   Consistently complied with, any exceptions to its application must duly be authorized by the Board Chairperson.

4. GLOSSARY AND ACRONYMS

4.1   Glossary

Technical Staffs	These are personnel that perform activities related to computer programming, Designing, Simulations, Computer Modelling and all other related activities that requires high end computer processing resource requirements.
Non-technical Staffs	These are personnel that perform basic computer operations that do not require high end computer processing resources.

4.2   Acronyms

Abbreviation	Explanation
BGP	Border Gateway Protocol
DBMS	Database Management System
DDOS	Distributed Denial Of Service
EAP	Extensible Authentication Protocol
e-GA	e-Government Authority
LAN	Local Area Network

MIMO	Multiple Input and Multiple Output
MPLS	Multiprotocol Label Switching
MRC	Maximal Ratio Combining
NAT	Network Address Translation
NSR	Nonstop Active Routing
OSPF	Open Shortest Path First
PKI	Public Key Infrastructure
RE	Routing Engines
RRM	Radio Resource Management
VPN	Virtual Private Network
VRF	Virtual Routing and Forwarding

5. RELATED DOCUMENTS

5.1. e-Government Infrastructure Architecture Standards and Technical guidelines (eGA/EXT/IRA/001).

5.2. e-Government Guideline (PO-PSM, 2017).

5.3. e-Government Act No 10, of 2019.

5.4. e-Government General Regulations of 2020.

5.5. Guidelines for Development, Acquisition, Operation and Maintenance of e-Government Applications (eGA/EXT/APA/006)

5.6. e-Government Security Architecture Standards and Technical Guidelines (e-GA/EXT/ISA/001).

6. DOCUMENT CONTROL

Version	Name	Comment	Date
Ver. 1.0	e-GA	Creation of Document	December 2020
Ver. 1.1	e-GA	1. Alignment to the e-Government Act 2. Add specifications for switches, photocopier, digital signage display, Panache My Air PC and heavy-duty printers on the network sections	July 2022

| | | 3. Update on the list of browsers to be used to remove the use of internet explorer
4. Update the list database to be used | |