UNIVERSITY OF DAR ES SALAAM

Guideline for ICT Service Management and Operations

Directorate of Information and Communication Technologies

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Plan Approval

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ACRONYMS AND ABBREVIATIONS

BC & DRP	Business Continuity and Disaster Recovery Plan
CCNA	Cisco Certified Network Associate
CBAP	Certified Business Analysis Professional
CMS	Content Management Systems
CSS	Cascading Style Sheets
DICT	Directorate of Information and Communication Technologies
DoICT	Director of Information and Communication Technology
eGA	e-Government Authority
HTML	HyperText Markup Language
ICT	Information and Communication Technology
ICTSMO	Information and Communication Technology Service Management and Operations
ICTSC	Information Security Classification
IT	Information Technology
LAN	Local Area Network
PHP	Hypertext Preprocessor
PMI-PBA	Project Management Institute - Professional in Business Analysis
ROI	Return on Investment
SOPs	Standard Operating Procedures
SQL	Structured Query Language
UDSM	University of Dar es Salaam

1. INTRODUCTION

The University of Dar es Salaam Information and Communication Technologies Policy of 2022 requires the University to strengthen the governance and management of Information and Communication Technology (ICT). Such efforts include the strategic management of the ICT officers to ensure they have relevant expertise and skills to support the development, use, support and maintenance of ICT resources and services across the University of Dar es Salaam (UDSM). In response to Sections 3.6 and 3.7 of the UDSM ICT Policy (2022), this document provides guidelines for the governance and management of ICT at UDSM.

2. SCOPE

This document provides guidelines for the strategic management and operations of ICT services across the UDSM campuses. It provides the composition of the ICT Governance team of the University, guides the formation and structure of ICT Management Team and proposes the composition of ICT personnel and expertise necessary to innovatively and sustainably develop, support and maintain ICT resources in the University. The guideline does not provide guidance on the institutional human resources management practices nor the recruitment process of ICT officers. Notwithstanding its limitations on ICT services management and support, it highlights, through its contents, the human resource needs of the University and how it should be optimally utilized to add value to role ICT plays in enabling and support core business and administrative operations of the University.

3. RATIONALE

The University of Dar es Salaam is a large and complex academic institution. Structurally and geographically, it has over 21 major academic units located in the Mwalimu Nyerere Mlimani Main campus and in several other locations in and outside the city of Dar es Salaam. Similarly, by March 2024 it had 1,392 academic staff and 1,239 non-academic staff and about 40,000 students across its campuses. At the same time most of the University core business and administrative functions are either enabled, facilitated, or supported by ICT solutions and services. This situation makes the governance and management of University ICT services and operations complex and become difficult to provide the scale and type of services needed by staff members, students and other stakeholders. As a result, the conventional setup and operational practices of ICT functions cannot meet the anticipated services that meets users' needs. Therefore, the University requires a strategic and innovative management and operations of ICT services to ensures equitable and quality availability, access and interoperable solutions and services. This guideline is meant to serve such purpose.

4. ICT GOVERNANCE AND LEADERSHIP

4.1. Overview

As per all other public institutions, the governance and management of ICT at the University are guided by the e-Government Act No. 10 of 2019. Section 18 of the Act which provides for Institutional ICT Steering Committee and Section 21 provides for Establishment of Institutional ICT Management Unit. In response to this directive, UDSM established the Directorate of ICT (DICT) in June 2022 as suggested in Version 1.1 of the *"University of Dar es Salaam Proposed ICT Governance and Management Framework"* of January 2020.

4.2. ICT Governance

The governance of the ICT at UDSM should be under the UDSM ICT Steering Committee (ICTSC) in accordance to the requirement of Section 18(1) of the e-Government Act of 2019. The role of the UDSM ICTSC is to:

i. review and approve the UDSM ICT policies, ICT strategy, ICT Plans and other ICT management instruments.

ii. review and provide guidance and advice on ICT investment portfolios and priorities.

iii. ensure alignment of ICT investment and use with the University's mission, core business, plans and operational needs.

iv. ensure ICT guidelines and standards are implemented by all units and members of the University community.

v. provide oversight on strategic ICT investments and ensure they add value in terms of the Return on Investment (ROI), operational performance and quality of services.

vi. ensure continuous monitoring and evaluation of all ICT projects implemented across the university.

vii. ensure ICT business continuity and disaster recovery plan is effectively executed.

viii. approve ICTSC sub-committees as may be, from time to time, constituted to address specific ICT-related matters.

ix. prepare and submit progress and ICT performance reports to the University Council.

x. review and approve ICT-related service level agreements with service providers.

xi. perform such other functions as may be directed by the accounting officer, university management or the University Council.

4.3. Composition of ICTSC

The e-Government Act of 2019 requires ICT Steering Committees (ICTSC) of all public institutions to be constituted by a minimum of six (6) members and a maximum of seven (7) members. This composition does not meet the UDSM's context-specific needs because of its status as an academic institution, the size of its campuses, the large number of its management team members and the complexity of its organisational structure. The proposed number cannot provide adequate representation of the UDSM institutional structure and functions in the ICTSC for better execution of its functions. Moreover, the Version 1.1 of the *"University of Dar es Salaam Proposed ICT Governance and Management Framework"* of January 2020 proposed a different composition of the UDSM ICTSC contrary to the provisions of the law. However, the UDSM ICT Policy of June 2022, proposed the revision of this framework in line with the ICT needs and functions of the University

The concerns above were raised in the UDSM ICT Policy of 2022 [*Appendix 1 (A), Page 49*]. The Policy proposed the revision of ICTSC composition in line with the ICT needs, structure, and functions of the University. The UDSM ICT Policy of 2022 proposes context-specific consideration of the ICTSC composition in line with the provisions of the e-Governance Act of 2019. Since the University has to adhere to the directives of the current law, it maintains 7 permanent members to the committee with voting power. Additionally, this guideline proposes six (6) other members to the committee to hold co-option or invitation status, until when the law provides otherwise. The six members are co-opted members designated to attended ICTSC meeting but without voting power. Other members will be invited when the ICTSC establishes need based on the specific meeting agenda(s).

Members:

i. The Vice Chancellor (Chairman)
ii. Director of ICT (Secretary and Technical Advisor)
iii. Deputy Vice Chancellor Academic
iv. Deputy Vice Chancellor Finance, Planning and Administration
v. Deputy Vice Chancellor Research
vi. Chief Cooperate Counsel and Secretary to the Council
vii. Manager of Procurement Unit

Invitees:

viii. Director of Finance
ix. Director of Planning, Development and Investment.
x. Director of Human Resource Management
xi. Principal of the UDSM College of ICT (ICT domain & technical expertise)
xii. Principal of the UDSM College of Engineering and Technology (ICT-related domains & technical expertise)
xiii. Dean of the UDSM Business School (management, resources and business)
xiv. Invited member(s) who might be needed based on needs (e.g., Chief Internal Auditor, ICT experts and heads of units implementing ICT projects).

5. MANAGEMENT OF ICT

5.1. Overview

Section 21 of the e-Government Act of 2019 provides for the establishment of an Institutional ICT Management Unit. In response to this directive, UDSM established the Directorate of ICT (DICT) in June 2022 as suggested in Version 1.1 of the *"University of Dar es Salaam Proposed ICT Governance and Management Framework"* of January 2020. However, the UDSM ICT Policy of June 2022, proposed the revision of the ICT management structure provided in the framework in line with the ICT needs and functions of the University *(Appendix 1 (B), Page 50)* and as provided in Section 21 of the e-Government Act of 2019.

5.2. Directorate of ICT

The management of ICT at UDSM is to be discharged by the Directorate of ICT (DICT). The mission of DICT is to enable the effective investment, acquisition, use, support and maintenance of ICT in support of the University mission and its strategic goals. In pursuit of this mission, the functions of DICT are to:

i. Deliver ICT products and services that meet the needs of the University community and achieve the highest level of customer satisfaction.

ii. Support the investment, acquisition and use of ICT to enable quality and innovative teaching, learning, research and scholarship activities.

iii. Provide high-quality ICT solutions to enable the execution of core business and administrative functions of the University.

iv. Provide leadership in planning for strategic and effective investment and use of ICT.

v. Provide and support a robust, reliable and secure ICT infrastructure that meets the needs of the University community.

vi. Attract, develop and retain quality ICT professionals to develop, support and maintain ICT resources and services at UDSM.

vii. Foster innovation within the UDSM ICT human resource, encouraging the exploration of emerging technologies.

viii. Oversee the deployment and support of ICT services used in the University but provided and supported by external providers such as e-Government Agency.

5.3. The Director of ICT

The ICT Directorate is to be led by the Director of ICT (DoICT). The DoICT reports directly to the Vice Chancellor and leads the University's strategic mission and efforts to promote and harness the potential of ICT in enabling core business and administrative functions.

The DoICT serves as the principal ICT leader for the University providing the vision and leadership for developing and implementing ICT strategies and initiatives across its campuses. DoICT is responsible for maintaining the vision for the future ICT needs of the University and for recommending strategies, priorities and projects that will best achieve the University's mission and strategic goals.

5.4. Responsibilities of the Director of ICT

The responsibilities of the DoICT are to:

i. assume the position of the main technical advisor of all ICT-related matters to the University and the secretary to the University ICTSC.

ii. provide leadership in developing strategic direction for ICT services across the University as per the needs of its constituents.

iii. oversee the execution of the UDSM ICT Strategy/Masterplan and routine ICT operations of the University.

iv. provide leadership and assign duties to all ICT officers and other staff under DICT.

v. monitor trends, technologies and innovations in the ICT industry and update the University's ICT ecosystem as necessary.

vi. lead the preparation of ICT management instruments and operational guidelines and standard operating procedures (SOPs) and their operationalisation process.

vii. implement ICT-related decisions made and directives given by the ICTSC and other University management bodies.

viii. endorse allocations of ICT resources and purse of ICT equipment, software and services.

ix. define and provide approval of access to ICT equipment, systems, services and physical infrastructure.

x. ensure that ICT fully serves the teaching, research, service missions and administrative functions of the University.

xi. ensure ICT-related policies, strategies, plans and SOPs are regularly reviewed to meet the ICT needs of the University.

xii. ensure the UDSM ICT resources are safe, secured and protected from threats.

xiii. ensure the effective implementation of the UDSM ICT business continuity and disaster recovery plan.

xiv. prepare budgets for ICT management activities and lead their execution.

xv. mobilise resources for the investment, support and maintenance of UDSM ICT resources.

xvi. lead the research and development of innovative ICT solutions that add value to the performance of the University's core businesses and administrative operations.

xvii. lead all contract negotiations with contractors (vendors and service providers) of

ICT services to the University.

xviii. establish and prioritise ICT needs of the UDSM community and present them to the University management for decisions.

xix. provide support to all users of ICT resources and services across the university through effective helpdesk support.

xx. endorse employment of ICT officers based on needs and skills relevant to the University and job allocation of ICT officers as per this guideline.

xxi. represent the University on all matters related to ICT functions of the University as directed by the Vice Chancellor.

xxii. discharge any other ICT-related management activities of the University as assigned by the University Management.

5.5. Sections in the Directorate of ICT

The *"University of Dar es Salaam Proposed ICT Governance and Management Framework"* of January 2020 which established the Directorate of ICT (DICT) in June 2022 proposed the structure of the Directorate with two sections only *(Section 4.2, page 10)*. However, the UDSM ICT Policy of 2022, suggested the revision of this structure because it did not meet the needs of ICT services of the University and failed to consider key support ICT functions for large and complex organisations such as the UDSM *[Appendix 1 (B) Page 50]*. This observation is consistent with Section 21 of the e-Government Act of 2019. The law provides that the structure and staffing of Institutional ICT Management Unit should be guided by institutional specific ICT needs required for its efficient performance of functions. Therefore, this guideline proposes DICT to be composed of the following functional units:

i. Academic Technology Services Section

ii. ICT Infrastructure and Maintenance Section

iii. Digital Innovation and Applications Section

iv. ICT Security and Compliance Section

v. Service Management Section

The sections above are further clarified in the next pages as follows:

- Figure 1 presents the structure of the functional sections of the DICT.

- Table 1 presents the functions and personnel requirements of individual sections in the DICT.

- Table 2 lists the expertise and key qualifications of ICT officers needed to support the functional units of DICT.
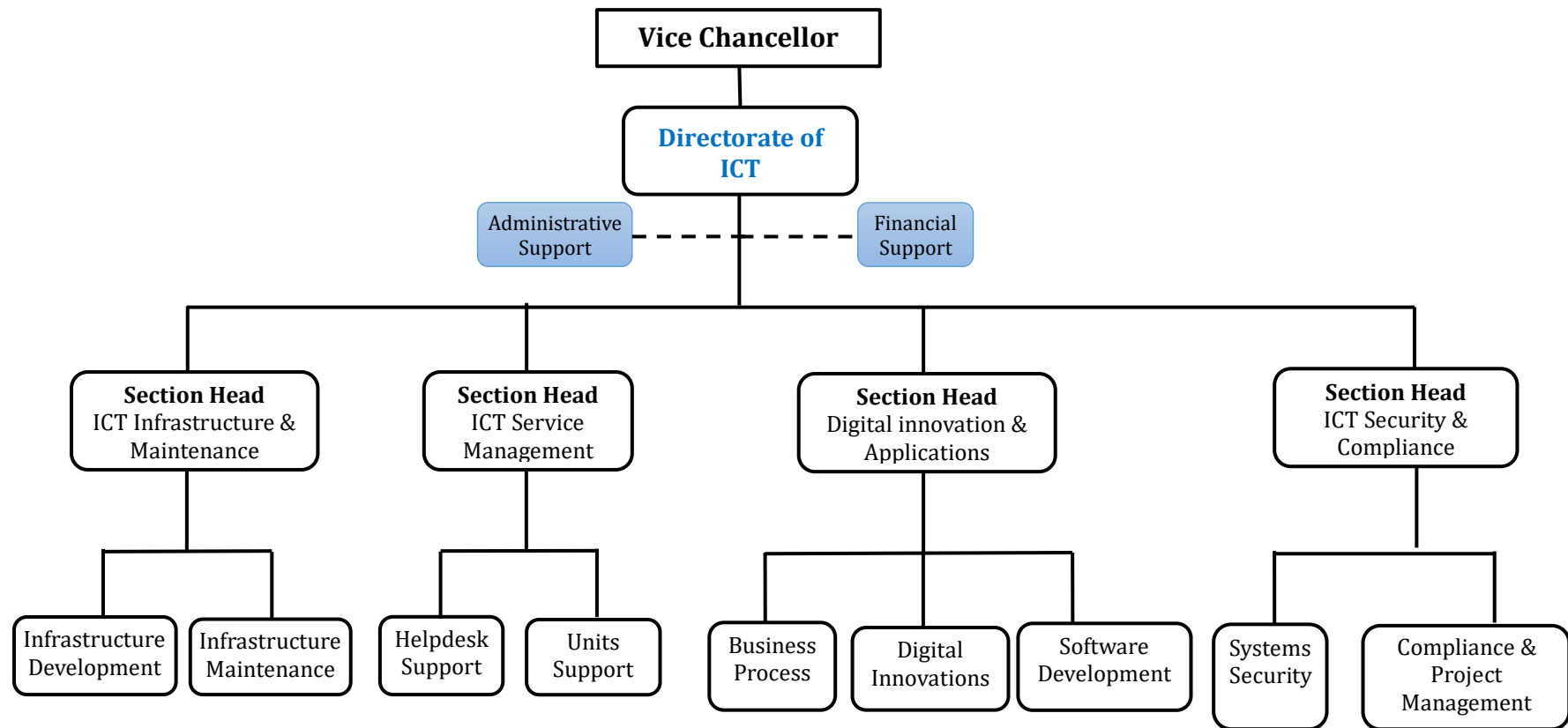
Figure 1: The ICT Management Structure of the UDSM Directorate of ICT

Table 1: Sections, functions, Personnel Requirements in the UDSM Directorate of ICT

S/n	Section Name	Functions	Personnel Requirements	Number of Staff
1	**Infrastructure and Maintenance** • Infrastructure development • Infrastructure maintenance	i. Infrastructure development ii. Network design, development, administration and maintenance iii. Server room management and maintenance iv. Backup and storage v. Systems administration	• Head of Section (1) • Systems Administrators (2) • Network Administrators (2)	5
2	**Innovation and Applications** • Business process • Digital innovation • Application acquisition	i. Business process re-engineering ii. Business analysis iii. Requirements engineering iv. Applications innovation, design and acquisition v. Staying on top of technological trends vi. Solutions development vii. Data management and analytics viii. Website development and management ix. ICT projects management	• Head of Section (1) • Systems Designers (2) • Systems/Business Analysts (2) • Software developers (4) • Webmaster (1)	10
3	**ICT Security and Compliance** • Security • Compliance	i. ICT Security management ii. ICT Compliance management iii. ICT risk management iv. ICT Governance management instruments v. ICT Standards and guidelines management vi. Quality assurance vii. ICT Business continuity and disaster recovery functions viii. Enterprise architecture management	• Section Head (1) • Systems Administrators (2) • Systems Security Experts (2)	5
4	**Service Management** • Unit support • Helpdesk support	i. ICT Helpdesk Support ii. UDSM Units Support iii. ICT Contracts management iv. Performance management v. ICT Training vi. Hardware maintenance	• Section Head (1) • Systems Administrators (4) • ICT Support (5) • ICT Technicians (10)	20
			TOTAL NUMBER OF ICT OFFICERS	**40**

Table 2: Expertise and Key Qualifications needed to support the functional units of the UDSM Directorate of ICT

S/n	Staff Sections	Staff Expertise	Key Qualifications / Skillsets
1	Director of ICT	ICT Governance and Management	• Must have an MSc in Computer Science, Computer Engineering, Information Technology, or related field • Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field • Hands-on technical experience in ICT field such as software development, network administration, systems analysis and design, information system management or database administration • Strong background and at least 5 years of experience in ICT management and leadership. • Proven ability to innovate and leading organisational change. • No Academic Responsibilities
2	ICT Infrastructure and Maintenance	Head of Section (1)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field. • Must have a Cisco Certified Network Associate (CCNA) certificate • MSc in the computer science or related field may be an added advantage. • Relevant experience in ICT infrastructure management
		Systems Administrators (2)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field. • Relevant experience in Systems Administration • Certification in System administration e.g. Proficiency in Windows, Linux may be an added advantage
		Network Administrators (2)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field. • Cisco Certified Network Associate (CCNA) certificate may be an added advantage

S/n	Staff Sections	Staff Expertise	Key Qualifications / Skillsets
			• Practical experience with network management tools, protocols and operating systems • Strong problem-solving skills
3	Digital Innovation and Applications	Head of Section (1)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field. • MSc in a related field may be an added advantage. • Relevant experience in digital innovation and applications or software development
		Systems Designers (2)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field. • Relevant experience in ICT system design • Understanding of various system development frameworks for frontend and backend • Knowledge of structured databases
		Systems or Business Analysts (2)	• A bachelor's degree in business administration, finance, economics, or a related field • Strong analytical, communication, problem-solving and technical skills. • Relevant experience in business analysis, project management, or related fields • Certifications such as CBAP (Certified Business Analysis Professional) or PMI-PBA (Professional in Business Analysis) is an added advantage
		Software developers (2)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field. • Proficiency in programming languages such as Java, Python, C++, or JavaScript. • Understanding of software development methodologies like Agile or Scrum. • Experience with version control systems like Git. • Strong problem-solving skills and attention to detail. • Knowledge of databases and SQL.

S/n	Staff Sections	Staff Expertise	Key Qualifications / Skillsets
			• Familiarity with web development frameworks and tools.
			• Excellent communication and teamwork abilities.
			• Eager to continue learning and staying updated with new technologies and industry trends
		Webmaster (1)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field.
			• Proficiency in programming languages such as HTML, CSS, JavaScript and backend languages like PHP or Python.
			• Experience with content management systems (CMS) like WordPress, Joomla, or Drupal.
			• Understanding of web analytics tools such as Google Analytics to track website traffic and performance.
			• Knowledge of Search Engine Optimization principles to optimise website content for better visibility in search engines.
			• Strong problem-solving skills and attention to detail.
			• Excellent communication skills to collaborate with designers, developers and content creators.
			• Familiarity with web hosting platforms and server management.
			• Ability to troubleshoot and resolve technical issues efficiently.
			• Eager to learn and stay updated with emerging web technologies and trends.
4	ICT Security and Compliance	Section Head (1)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field.
			• Must have a recognised certification in ICT Security
			• MSc in a related field may be an added advantage
			• Relevant experience in ICT security and compliance
			• Relevant certification in ICT security

S/n	Staff Sections	Staff Expertise	Key Qualifications / Skillsets
		Systems Administrators (2)	• A bachelor's degree holder in computer science, Computer Engineering, or a related field
			• A strong understanding of operating systems: Windows and Linux, for server management and user support
			• A strong understanding of network protocols, configuration and system troubleshooting
			• A strong understanding of system security principles and data protection
			• A strong understanding of system security tools and techniques used to secure systems against vulnerabilities
			• Understanding on how to setup backups for quick disaster recovery
			• Proven ability to document of system administration issues (e.g. configurations, procedures applied)
			• Be dynamic in understanding modern techniques and procedures applied in system administration
			• Be able to work in a team
		Systems Security Experts (2)	• Must have a bachelor's degree in computer science, Computer Engineering, or a related field. Security certification such as CISSP AND CISM will be an added advantage.
			• Proven ability to develop and enforce security policies, procedures and guidelines.
			• Strong knowledge of identifying security vulnerabilities and implementing corrective measures.
			• Skilled in conducting security audits and assessments to ensure compliance with security standards.
			• Ability to monitor and analyze network traffic to detect and respond to security incidents.
			• Proficient in creating and maintaining security documentation, including reports and logs.

S/n	Staff Sections	Staff Expertise	Key Qualifications / Skillsets
			• Experience in providing security training and awareness programs to staff and users.
			• Experience in safe use of Vulnerability Analysis and Penetration Testing Tools
		System Analyst (2)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field
			• Strong analytical and problem-solving skills
			• Knowledge of programming languages, database management and experience with system analysis tools
			• Practical experience in the field
			• Certification is an added advantage
5	Service Management	Section Head (1)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field
			• MSc in a related field may be an added advantage.
			• Relevant experience in ICT Service Management and Support
		ICT Support (5)	• Must have a BSc in Computer Science, IT, Computer Engineering, Information Systems management or any related field
			• Familiarity with multiple operating systems such as Windows, macOS and Linux.
			• Knowledge of network configurations, including LAN/WAN technologies.
			• Ability to manage time effectively, especially when handling multiple issues simultaneously.
			• Understanding of basic data security practices and compliance with data protection regulations.
			• Ability to document processes and instructions clearly
		ICT Technicians (10)	• Diploma in ICT-related field such as Computer Science, IT and Computer Engineering.
			• Familiarity with multiple operating systems such as Windows, macOS and Linux.
			• Ability to diagnose and repair hardware issues in computers and peripherals.

S/n	Staff Sections	Staff Expertise	Key Qualifications / Skillsets
			• Ability to manage time effectively, especially when handling multiple issues simultaneously.

6. RELATED ICT MANAGEMENT INSTRUMENTS

6.1. ICT Steering Committee

Besides this guideline, in the execution of its roles, the ICTSC is to be guided by other Governance and Management Instruments which include:

i. UDSM ICT Policy

ii. UDSM ICT Master Plan

iii. UDSM ICT Business Continuity and Disaster Recovery Plan

iv. UDSM ICT Security Policy

v. UDSM ICT Enterprise Architecture

vi. Acceptable Use of ICT Resources Guidelines

vii. ICT Service Management

viii. ICT Project Management Procedures

ix. ICT Development, Acquisition and Maintenance Procedures

6.2. Directorate of ICT

In the execution of its day-to-day activities, the DoICT and all the staff under the Directorate are to be guided by the following instruments:

i. All ICT management instruments mentioned in section 6.1 of this document

ii. All ICT standard operational instruments which include:

   a. *ICT Security Awareness and Acceptable Use of ICT Resources.*

   b. *Computer Passwords and System Access Controls.*

   c. *Security Risk Assessment and Requirements for Information Assets.*

   d. *Information Assets Classification and Control.*

   e. *ICT Human Resources Management.*

   f. *Physical and Environmental Controls of ICT Resources.*

   g. *Wireless Network, Mobile Computing & Tele-working.*

   h. *Systems Development and Maintenance Plans*

   i. *Procurement and Contracts Management of ICT equipment and services*

iii. Any other ICT policy, guideline, plan, or SOP that might be developed from time to time as will be decided by the ICTSC or DICT.

7. IMPLEMENTATION, REVIEW AND ENFROCEMENT

7.1. Implementation and Reviews

i. This document shall come into operation once approved by the UDSM ICTSC. Thereafter it shall be considered mandatory for reference in all matters related to the Management and operations of ICT at UDSM.

ii. Once approved by the UDSM ICTSC this guideline should be used by the DoICT to structure the functions of DICT as proposed in this document.

iii. This document shall be reviewed after every three years or anytime whenever the UDSM business environment changes in a way that affects the current guideline or the need for improving any aspect of ICT service management and operations.

7.2. Roles and Responsibilities

i. It is the responsibility of ICTSC and the DoICT to read, understand and implement the guidelines provided on this document.

ii. The DoICT should ensure all ICT officers understand the structure and functions of DICT and the roles of individual staff as provided in this guideline in order to guarantee quality ICT services to the University community.

iii. Users of this guideline are expected to exercise reasonable judgement in interpreting its provisions and in making decisions about ICT services management and operations.

iv. Any person with questions regarding the application or meaning of statements in this guideline shall seek clarification from DICT office.

7.3. Monitoring and Evaluation

i. The UDSM ICTSC shall, as part of its meetings' agenda, monitor and evaluate the compliance to this guideline as presented by the DoICT.

ii. The ICTSC shall conduct regular assessments to establish the need for improving this guideline or accommodating new requirements in response to the new development of ICT services and operations.

7.4. Exceptions

In case of any exceptions to this guideline, thorough documentation should be made, and a proper channel of authorisation should be followed using the same authority which approved this document.