UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

MOSHI CO-OPERATIVE UNIVERSITY (MoCU)
CHUO KIKUU CHA USHIRIKA MOSHI

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) STRATEGY, 2021/2022 – 2025/2026

MARCH, 2022

FOREWORD

The Moshi Co-operative University (MoCU) became a full-fledged University in 2014 and launched its first ICT Policy in 2015 and revised it in 2019. Since then, the ICT Policy has been used as a guide for identification, promotion and usage of ICT in planning and implementation of academic, research, consultancy and administrative functions. The ICT Policy, however, lacked implementation strategies that would guide on the successful implementation of policy issues.The University, thus, found it necessary to come up with this five-year (2021/2022 – 2025/2026) strategy.

The underpinning rationale of having this ICT Strategy is based on the fact that a number of disruptive changes have taken place in recent years and the fact that MoCU has no comprehensive and top-level framework that guides the optimal utilization of ICTs to leverage its various activities. The strategy therefore aims at providing top level guidance in the deployment of ICT to improve internal and external service delivery and to improve efficiency and effectiveness of operations in the University.It is anticipated that this ICT Strategy will help the University to move toward its Vision of becoming: “An eminent academic institution committed to support co-operative and business development”.

The formulation process of this Strategy was participatory, benefiting from contributions from a several ICT stakeholders within and outside the University. The University wishes to extend its gratitude to various stakeholders who contributed to the formulation of this ICT Strategy and invites them to support its implementation.

Prof. Alfred. S. Sife

Vice Chancellor

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ABBREVIATIONS AND ACRONYMS

BCP	Business Continuity Plan
EMS	Electronic management system
GePG	Government electronic Payment Gateway
GMS	Government electronic Mailing System
GoT-HoMIS	Government of Tanzania Hospital Management Information System
GSPP	Government Salary Payment Platform
HCMIS	Human Capital Management Information System
ICT	Information and Communication Technology
IDS	Intrusion Detection System
IPS	Intrusion Prevention System
Mbps	Mega bit per second
MoCU	Moshi Co-operative University
MoCU-AS	Moshi Co-operative University Admission System
MUSARIS	Moshi Co-operative University Students' Admission and Registration System
MUSE	*Mfumo wa Ulipaji Serikalini*
ODeL	Online Distance electronic Learning System
OFCs	Optic Fibre Cables
TANePS	Tanzanian National electronic Procurement System

DEFINITION OF TERMS

Bandwidth	The amount of data that can be transferred over a network in a given time period (usually a second). Bandwidth is usually expressed in bits per second (bps), or as some larger denomination of bits, such as Kilobits/second (Kbps), Megabits/second (Mbps), or Gigabits/second(Gbps).
Firewall	A network security system that controls the incoming and outgoing network traffic based on an applied set rule.
ICTs	A short form for Information and Communication Technologies. It is a generic term used to express the convergence of information technology, broadcasting, and communication. One prominent example is the Interne.
In-house Software	A Software product which has been developed within the University.
Internet	A massive Network of Networks that connects millions of computers globally.
Network	A set of computers connected together so as to share the available resources such as printer and software.
Network Backbone	A central conduit part of Computer Network Infrastructure which interconnects different Networks and provides a path for exchange of the data between different Networks. It is designed to carry Network traffic at higher speed so as to maximize the reliability and performance of large-scale data communications.
Off-the-Shelf Software	A Software product which are ready-made and available for

	sale to the general public.
Software	Any set of machine-readable instructions that direct a computer's processor to perform specificoperations.
Staff mail	A formal method of exchanging digital messages from an author to one or morerecipients via Government Mailing System (GMS).
Wireless Access Points	Also known as Hotspot or Wi-Fi are networks rolled out using radio waves to provide mobile network access as defined under IEEE 802.11 protocol.

1. INTRODUCTION

1.1 Institutional Background Information

The history of the Moshi Co-operative University (MoCU) dates way back to 5th January 1963 when the then Co-operative College Moshi was established. The College's primary responsibility was training of human resource in the co-operative sector under the then Ministry of Co-operatives and Community Development. The College was subsequently established through the Co-operative College Act No. 32 (Repealed) of 1964 as an autonomous institution with its own Governing Board. In 2004, the Co-operative College Moshi was transformed into MUCCoBS as the Constituent University College of Sokoine University of Agriculture (SUA) through the Government Declaration Order No. 22 of 2004.

MoCU came into being as a result of transforming MUCCoBS to a full-fledged University in September, 2014. The University is governed by its own Charter, made under the Universities Act No. 7 of 2005 (Cap 346) of Tanzania laws. It was accredited by the Tanzania Commission for Universities (TCU) on 7th November, 2018.

MoCU is located in Moshi Municipality, on the foot of Mount Kilimanjaro along Sokoine Road. The University has an Institute located in Shinyanga Region along Tabora Road, namely Kizumbi Institute of Co-operative and Business Education (KICoB).

In addition, the University operates 13 regional offices catering for all regions in Tanzania. These offices are in Mtwara (serving Mtwara and Lindi regions), Mbeya (serving Mbeya, Rukwa and Songwe regions), Kilimanjaro (serving Kilimanjaro, and Arusha regions), Shinyanga (serving Shinyanga and Simiyu regions), Mwanza (serving Mwanza, Geita, Mara and Kagera regions), Iringa (serving Iringa and Njombe regions), Dodoma (serving Dodoma and Morogoro regions), Coast (serving Coast, Dar esSalaam regions; Unguja and Pemba Islands), Singida (serving for Singida and Manyara regions), Ruvuma, Tanga, Tabora and Kigoma (serving for Kigoma and Katavi regions).

1.1.1 Vision

To be an eminent academic institution committed to support co-operative and business development.

1.1.2 Mission Statement

To promote sustainable co-operative and business development through quality training, research and advisory services.

1.1.3 Motto

Ushirika ni Biashara.

1.1.4 Objects and Functions

The general objects and functions of the University shall be to advance knowledge, wisdom, understanding and enhance creativity through training, research and advisory services on all matters relating to co-operative development, rural transformation, business studies, information and communication technology, law and any other relevant area of learning and knowledge at national and international levels. The specific objects and functions of the University are spelt out in the MoCU Charter, 2015.

1.1.5 Core Values

The University core values include *cooperation, professionalism, integrity, transparency, accountability, social responsibility, equality, courtesy to all, creativity and innovation*.

1.1.6 Core Management Principles

The University management shall direct itself to achieve efficiency and effectiveness in its operations. It shall also strive to cope with global and national challenges. To this end, the University shall adopt results-oriented management practices that aim at provision of effective management services to its key stakeholders.

1.2 Overview of theICT Strategy

The adoption of Information Communication Technologies (ICTs) is increasingly becoming a prerequisite in achieving efficient and effective organizational and individual service delivery across the world. In that light, organizations across the globe, including MoCU, are keen to take advantage of ICTs to achieve efficiencies in their internal operations as well as to improve access and timeliness in delivering services.

For any organization to pursue its mission efficiently and effectively, it needs to have a comprehensive framework that provides appropriate guidance to harness ICTs to achieve internal efficiency and effectiveness as well as improving delivery of service. MoCU has realized the importance of having ICT as a supporting tool to fulfil its established mandate of teaching, research and outreach activities, and consequently developing its ICT strategy aims at aligning ICTs with its objectives and ambition as articulated in the MoCU's Five Year Corporate Strategic Plan 2021/2022 – 2025/2026.

This strategy is therefore intended to provide MoCU a high-level direction on the design, control and use of ICTs in order to support the attainment of MoCU'sgoals and objectives. The strategies presented in this documentwere developed in consultation with various key stakeholders, and are expected to steer MoCU closer to its vision of becoming: "An eminent academic institution committed to support co-operative and business development".

1.3 Rationale of the ICT Strategy

The underpinning rationale of having ICT Strategy is based on the fact that a number of disruptive changes have taken place in recent years and the fact that MoCU has no comprehensive and top-level framework that guides the optimal utilization of ICTs to leverage its various activities. The strategy therefore aims at providing top level guidance in the deployment of ICT to improve internal and external service delivery and to improve efficiency and effectiveness of operations in the University.

In particular, the rationale behind the strategy includes:

(i) Planning strategically the ICT investment;

(ii) Managing scarce ICT resources optimally;

(iii) Prioritising ICT processes and projects based on what provides the most value;

(iv) Measuring how well MoCU is managing ICT portfolio to meet its needs; and

(v) Instituting standards and minimise risks in ICT deployment

1.4Purpose

This document puts in place a framework that will provide MoCU with a secure ICT environment which is effective and has the flexibility required to support staff, students and other MoCUstakeholders to effectively and efficiently carry out their day-to-day business operations.

1.5 Expected Outputs of the ICT Strategy

When this strategy is fully embraced and implemented, the following outputs are expected to be achieved by the University:

a) Improved organisational, teams and individual staff effectiveness

b) Business-led investment whereby ICT investments will be made based on the strategic outcomes required by MoCU.

c) Improved customer service in the sense that the usage of ICT in MoCU's business operations is expected to drive better service delivery, improve MoCU operations and productivity as well as enhancing improved MoCU's engagement with people, government organizations, community and business it serves. Consequently, better, quality, timely and more accessible services and goods to MoCU's stakeholders will be realised. As a result, the process will streamline and expedite the customer engagement process.

d) Improved Human Resource Capacity and Capability to develop, maintain and sustain ICT related initiatives within and beyond MoCU.

e) Improve information security in the sense that there will be a comprehensive framework to deal with Agency's information security in the course of utilizing ICT in day-to-day institutional business endeavours.

1.6 ICT Strategic Plan Guiding Principles

To achieve and enlighten the stated rationale and the proposed ICT strategies, the following nine guiding principles are adopted. These principles require commitment not only from MoCU's ICT professionals but from all employees.

i) **Functionality:** Drive ICT initiatives according to the beyond MoCU's business needs, goals, and objectives, and develop a sound business case before making any new investment.

ii) **Interoperability:** Deploy systems that are flexible and interoperable to respond quickly and efficiently to changing business needs.

iii) **Simplicity:** ICT systems must be easy to use in order to win user acceptance. Supporting procedures for hardware and systems should be clear enough to simplify usage of ICT resources.

iv) **Affordability:** Acquire, manage, and use ICT resources economically and efficiently through standardized selection and implementation processes to provide maximum benefit to beyond MoCU as a whole.

v) **Business Continuity:** beyond MoCU's operations must be provided with the capability to continue regardless of disruptive events.

vi) **Customer Care:** All the beyond MoCU's stakeholders shall be treated with courtesy and due respect.

vii) **Maintainability:** all the technology acquired by beyond MoCU should observe the following; sustainability, reliability, upgradability and ease of repair in event of failure sustain.

viii) **Collaboration and Knowledge Exchange:** Develop knowledge management mechanism and process for sharing and reusing knowledge easily within beyond MoCU and with external stakeholders to help improve beyond MoCU's effectiveness and quality service delivery

ix) **Scalability:** Develop reliable and scalable systems infrastructure with adequate capacity and speed

2.SITUATIONAL ANALYSIS

This section examines the development of MoCU's ICT environment by providing a brief account of the Institution's performance with regards to ICT with a view of portraying important lessons. It briefly presents an analysis of the current ICT status at MoCU evaluating upon the Strengths, Weaknesses, Opportunities as well as Challenges so as to extract issues that need to be addressed.The results of the Situation Analysis will form the basis of interventions to be carried out under this Strategy.

2.1 Efforts Undertaken to Improve ICT infrastructures at MoCU

In facilitating the use of ICT at MoCU, a number of initiatives were undertaken to improve ICT infrastructures at the University. Notable achievements identified include:

i) Increase of internet bandwidth at Moshi and Kizumbi Institute of Co-operative and Business Education (KICoB)
ii) Restructuring of University Network
iii) Increasing wireless access points across the campuses in Moshi and KICoB
iv) Installation of underground Optic Fibre Cables (OFCs) between various buildings within the campus
v) Extending of Internet connectivity to areas that had no internet connectivity in Moshi and KICoB
vi) Acquisition and installation of servers
vii) Improvement of computer laboratories in Moshi and KICoB
viii) Monitoring of internet traffic to all users
ix) Establishment of a reliable backup plan

The above initiatives led to a number of benefits including:

i) Number of internet users especially students increased
ii) Increased access to electronic resources for teaching and learning amongst students and staff
iii) Improved service delivery in different offices that require internet connection
iv) Optimal utilization of ICT resources

The above benefits to a large extent have led to increase in the use of ICT in core and non-core University functions.However, there still are a number of challenges that hinder optimal provision of ICT services. Some of those challenges are:

i) Inadequate bandwidth that suffice the increased number of internet users
ii) Inadequate ICT infrastructures (e.g. computer labs) to support the teaching and learning process
iii) Inadequate ICT personnel to undertake various administrative issues
iv) Inadequate ICT tools to be used by ICT personnel in performing various tasks
v) Inadequate regular trainings amongst University ICT personnel

2.2 SWOC Analysis

The strengths, weaknesses, opportunities and challenges (SWOC) analysis assessed the internal environment (strengths and weakness) and the external environment (opportunities and challenges) under which MoCU ICT function operates. The result of SWOC analysis is presented in Table 1.

Table 1: SWOC Analysis

Strengths	**Weaknesses**
• Availability of competent and qualified ICT staff • Availability of underground cabling infrastructure • Availability of the Department of ICT • Existence of e-government standards and guidelines • Availability of in-house developed software	• Inadequate ICT Staffs • Inadequate capacity building to ICT staffs • Absence of ICT Service Level Agreements • Limited budget for ICT capacity building interventions
Opportunities	**Challenges**
• Availability of local and International ICT training Institutions • Supportive legal, political and socio-economic environment • Access to emerging technological advancements • Existence of e-Government Authority to support ICT initiative in the University • ICT is well featured in the corporate strategic plan (2021/2022-2025/2026)	• High price for internet services • Absence of stable power supply • Limited government employment

2.3 Stakeholders Analysis

The Stakeholders Analysis involved identifying various stakeholders of MoCU ICT services, their expectations in terms of type of service as well as quality of the services to be offered, and potential impacts of not meeting these expectations. Stakeholders analysis is presented in detail in Table 2.

Table 2: Stakeholders, Services offered and their expectations

S/N	Stakeholder	Expected Services	Stakeholders' Expectations	Potential Impacts of not meeting their expectations
1	Directorate of Planning and Finance (DPF)	• Finance Management Information System (MUSE and VoteBook Manager) • GePG • PlanRep • Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services provided by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department ofICT • Loss of trust • Vulnerability to security risks
2	Directorate of Undergraduate Studies (DUS) and Directorate of Research and Postgraduate Studies (DRPS)	• Students Admission System (MoCU-AS) • Students' Academic Records Information System (MUSARIS) • Timetabling system • Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks

S/N	Stakeholder	Expected Services	Stakeholders' Expectations	Potential Impacts of not meeting their expectations
3	Faculty of Co-operative and Community Development (FCC) and Faculty of Business and Information Sciences (FBIS)	• Students' Academic Records Information System (MUSARIS) • Timetabling system • Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks
4	Directorate of Co-operative Library and Archives (DCLA)	• Library Management System (ABCD) • Institutional Repository • Subscribed Information Resources Databases • Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks
5	Institute of Continued Co-	• Open Distance Leaning (ODeL) system	• Reliable, secured and timely	• Poor services delivery

S/N	Stakeholder	Expected Services	Stakeholders' Expectations	Potential Impacts of not meeting their expectations
	operative Education (ICCE)	• Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks
6	Bureau of Consultancy Services (BCS)	• Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks
7	Directorate of Human Resource Management and Administration (DHRMA)	• Human Resources Management System (Lawson) • HCMIS • GSPP • GoT-HoMIS	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the

S/N	Stakeholder	Expected Services	Stakeholders' Expectations	Potential Impacts of not meeting their expectations
		• Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	internet services • Prompt and quality services • Timely communication	Department of ICT • Loss of trust • Vulnerability to security risks
8	Dean of Students (DoS)	• Students accommodation system • Students voting system • Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks
9	Procurement Management Unit	• TaNePS • Inventory Management System • Internet services • Hardware maintenance services • Software maintenance services	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT Loss of trust

S/N	Stakeholder	Expected Services	Stakeholders' Expectations	Potential Impacts of not meeting their expectations
		• Network maintenance services • Staff mails (GMS)	quality services • Timely communication	• Vulnerability to security risks
10	Kizumbi Institute of Co-operative and Business Education (KICoB)	• Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks
11	MoCUSO	• MUSARIS • Internet services • ICT resources for teaching and learning • Online voting system	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the University

S/N	Stakeholder	Expected Services	Stakeholders' Expectations	Potential Impacts of not meeting their expectations
12	Other University Units	• Internet services • Hardware maintenance services • Software maintenance services • Network maintenance services • Staff mails (GMS)	• Reliable, secured and timely services enabled by the Department of ICT • Fast and reliable internet services • Prompt and quality services • Timely communication	• Poor services delivery • Poor performance • Increasing Complaints • Poor Image and bad reputation of the Department of ICT • Loss of trust • Vulnerability to security risks
13	Prospective Students	• Students Admission System (MoCU-AS) • University Website	• Services available 24/7 • All information regarding academic programmes, fee structure and admission processes available in the University website	• Poor Image and bad reputation of the University • Loss of trust • Applying and/or joining other Universities
14	E-GA	• Compliance with ICT related guidelines from the government	• The University complies with all ICT related guidelines issued by the	• Vulnerability to security risks • Poor services delivery • Poor performance

S/N	Stakeholder	Expected Services	Stakeholders' Expectations	Potential Impacts of not meeting their expectations
			government	
15	TCRA	• Compliance with ICT related guidelines from the government	• The University complies with all ICT related guidelines issued by the government	• Vulnerability to security risks • Poor services delivery • Poor performance
16	ICT COMMISION	• Sensitization of ICT personnel to be registered by the commission • National ICT policy implementation at Institution level	• ICT personnel registered by the Commission • National ICT policy implemented at University level	• Poor services delivery • Poor performance
17	Ministry of Information, Communication and Information Technology	• ICT research • ICT innovations	• Quality ICT research and Innovations	• Poor Image of the University in terms of ICT research and Innovations
18	Commission of Science and Technology (COSTECH)	• ICT research • ICT innovations	• Quality ICT research and Innovations	• Poor Image of the University in terms of ICT research and Innovations

3.ICT STRATEGY FOCUS AREAS

There are several areas needed to be addressed in order to improve operation deficiencies with regard to ICT situation in the University. This strategy outlines twelve (12) focus areas and key issues to be addressed in each of those areas as described in details in subsequent sections.

3.1 ICT Infrastructure Development

ICT infrastructure embraces the availability of computer labs, networks connectivity and broadcasting, equipment and supplies. This raises the issues of technology standardization of equipment, services, maintenance and disposal. The availability of appropriate network infrastructures, equipment, and network access services such as e-mail, common data service, Internet and intranet, website, e-learning, and office computing systems is of paramount importance.

Issues:

i) Absence of adequate off the site backup facilities
ii) Inadequate consideration of the provision of ICT infrastructures during the construction of new buildings
iii) Absence of wireless access points to cover the entire campus
iv) Inadequate inter-buildings fibre connection

3.2 Access and Usage of ICT Facilities

Access and usage of ICT facilities and services shall be open to all students, staff, participants attending academic events, members of partner institutions visiting for official assignments, and others under certain restrictions to be prescribed by the University.

Issues:

i) Absence of access control mechanism to identify the eligible person to access and use ICT facilities
ii) Absence of access and usage of ICT facilities eligibility and restrictions criteria
iii) Inadequate tools for monitoring of ICT equipment connected to university network for security purpose

3.3 Software Development and Acquisition

The University recognizes the need to achieve a common methodology for both development and off-the-shelf software acquisition. In regard to this, software in use could be developed by staff, local vendors, or purchased off-the-shelf.

Issues:

i) Absence of guidelines for developing and/or acquiring software
ii) Absence of intellectual property rights protection of the available in-house developed software
iii) Inadequate documentation for some in-house developed software

3.4 ICT Procurement

All ICTs and services purchased by the University shall meet the user specifications. In addition, all purchases shall be in conformity with the overall standards of University procurement of goods and services as aligned to the Public Procurement Act.

Issues:

i) Absence of University tool to guide the procurement of all ICT goods and services
ii) Absence of ICT facilities inventory control mechanism
iii) Absence of guidelines to dispose of obsolete ICT equipment

3.5 ICT Skills Capacity Building

The University recognizes that ICT is a dynamic field and the benefits to be derived from its usage are significant. As such, the University shall plan for ICT capacity building programmes and implement them as per and when the need arises.

Issues:

i) Absence of ICT skills needs assessment plan amongst different user groups
ii) Absence of a regular ICT skills capacity building

3.6 Content Development and Communication

The University develops a number of digital contents which are disseminated to various local and global stakeholders through different communication media including website, e-mail, e-learning, radio, television and social media networks.

Issues:

i) Absence of mechanisms to ensure appropriateness, relevance, accuracy, consistency and timeliness of all developed contents
ii) Absence of mechanisms to equip all designated personnel with relevant up to date skills and knowledge

3.7 Data Communication Networks

Data Communication Networks and Services have evolved into the backbone for the provision and usage of daily ICT services at the University. In that case, the University recognizes that there is a need for a fast rate of innovation and more effective technological development in data communication.

Issue:

i) Inadequate bandwidth to effectively maintain the University's application such as e-mail and other information systems (e.g. MUSE,GoT-HoMIS, etc.)
ii) Absence of a central repository to maintain databases and website hosting
iii) Absence of tools for monitoring and documenting network performance and usage

3.8 Electronic Services Provision and Management

The University recognizes the need for digitization of its functions to reduce paper usage and manual work. In that case, the University commits itself to the provision of appropriate electronic services and ensures efficient management.

Issues:

i) Absence of electronic system for storing and managing office files
ii) Absence of business model for the provision of electronic services to external clients.

iii) Low level of awareness and usage skills about electronic services among various categories of users
iv) Absence of centralized electronic reporting system for providing technical support in line with approved ICT procedures for any system, service, device downtime or breach.

3.9 Telecommunications and Unified Communications

The University envisions the use of Telecommunications and Unified Communications Services towards implementation of an ICT enabled communications service. These services include telephone, teleconference, videoconference, and VoIP services. These services will be provided to support the communication needs required for the smooth operations across the University.

Issues:

i) Absence of videoconferencing facilities.
ii) Absence of Call Centre in which calls from clients are directed.
iii) Inadequate routine maintenance, upgrade and daily monitoring of the communications service usage.

3.10 Special Needs ICT Usage

Universally, the development in ICT supports the extension of access to all users. The University recognizes that the provision of ICT services should take into account the needs of special user groups such as the visually, motor and auditory impaired.

Issue:

i) Inadequate appropriate access to ICTs by people with special needs

3.11 ICT InfrastructureMaintenance and Management

The University recognizes the importance of maintenance and repair of ICT facilities in due time. To ensure safe and proper usage, the University requires a well-planned maintenance guideline. To that end, all ICT infrastructure and facilities shall be appropriately maintained and properly managed.

Issues:

i) Absence of updated ICT facilities maintenance plan
ii) Inadequate resources for regular maintenance of ICT facilities.
iii) Inadequate periodic assessment of all ICT facilities.

3.12 ICT Security and Safety

Security and safety are about protection of ICT infrastructure, data and the user community against attacks from internal or external sources. ICT facilities like computer rooms, workstations, servers, switches, hubs, routers, firewalls, network wiring systems and other small or large ICT equipment shall be secured.

Issues:

i) Absence of strong authentication and authorization security mechanisms.
ii) Inadequate backup and recovery of University operational data.
iii) Absence of well-equipped server room for housing all critical systems.
iv) Inadequate intrusion detection systems
v) Absence of consistent procedures for removal of licensed software and confidential data

4. OBJECTIVES, STRATEGIES AND TARGETS

The ICT Strategy focuses on improving business processes and preparing a conducive, secure, and safe ICT environment in order to meet the University's core activities of teaching, research and outreach activities. The plan includes strategic objectives, strategies, and targets. These are identified in each of the following focus areas; ICT Infrastructure Development, Access and Usage of ICT Facilities, Software Development and Acquisition, ICT Procurement, ICT Skills Capacity Building, Content Development and Communication, Data Communication Networks, Electronic Services Provision and Management, Telecommunications and Unified Communications,Special Needs ICT Usage, ICT Infrastructure Maintenance and Management, and ICT Security and Safety. To reach the targets within the specified timeframe, annual implementation plan for incremental targets should be prepared while the implementation tools and documents should be effective by 2023.

4.1 ICT Infrastructure Development

ICT infrastructure development ensures easy accessibility, resiliency, reliability, affordability, stability, modern and high-quality levels of ICT facilities and services.

Strategic Objective:ICT infrastructure is up, running, and accessible to all specified users.

Strategies	Targets
a) ICT infrastructure in all buildings installed	i) Inter-buildings fibre connection installed by June, 2026. ii) The mechanism for ensuring the provision of ICT infrastructure during the construction of new buildings is defined by June, 2022
b) Accessibility of ICT infrastructure ensured	i) wireless access points to cover the entire campus installed by June, 2026 ii) Off the site backup service procured by December, 2022

4.2 Access and Usage of ICT Facilities

The objective of Access and Usage of ICT Facilities is to define and implement mechanisms for appropriate and responsible access and use of ICT resources and services.

Strategic Objective: Appropriate and responsible access and use of ICT resources and services ensured

Strategies	Targets
a) Appropriate and responsible access and use of ICT resources and services enhanced	i) Access control mechanism to identify the eligible person to access and use ICT facilities defined and implemented by December, 2022 ii) Access and usage of ICT facilities eligibility and restrictions criteria defined and implemented by June, 2026 iii) Tools for monitoring of ICT equipment connected to university network developed/procured by December, 2022 iv) Mechanisms to ensure users who access ICT resources and services use them as per their roles implemented by December, 2022

4.3 Software Development and Acquisition

Software development and acquisition sets out a structure in which procedures and guidelines for proper software development and acquisition in order to increase efficiency, information assurance, value for money and enhance rationalization of ICT.

Strategic Objective: Procedures and guidelines for the development and acquisition of software defined

Strategies	Targets
a) In-house software development managed	i) Guidelines for in-house software development prepared and operationalized by June, 2023 ii) Intellectual property rights protection of the available in-house developed software acquired by June, 2026
b) Software outsourcing improved	i) Guidelines for software outsourcing prepared and operationalized by June, 2023

4.4 ICT Procurement

ICT Procurement provides a structure in which ICTs products and services purchased by the University shall meet the user specifications and conform with the overall standards of University procurement of goods and services as aligned to the Public Procurement Act.

Strategic Objective:ICT procurement enhanced.

Strategies	Targets
a) A tool to guide the procurement of ICT tools and services developed	i) Guideline for procurement of ICT tools and services developed and operationalized by June, 2023
b) ICT facilities inventory control developed	i) All available ICT equipment verified by June, 2026 ii) ICT inventory prepared by June, 2026
c) Guidelines to dispose obsolete ICT equipment developed	i) Guidelines to dispose obsolete ICT equipment developed and operationalized by June, 2023

4.5 ICT Skills Capacity Building

ICT skills capacity building stipulates mechanisms to enhance ICT skills amongst staff to maximize the ICT potentials at the University.

Strategic Objective: Capacity on ICT skills enhanced.

Strategies	Targets
a) Skills needs assessment conducted	i) Survey to establish ICT skills gaps amongst different user groups conducted by December, 2022 ii) Skills needs assessment plan prepared by December, 2022
b) ICT skills capacity enhanced	i) At least one capacity building workshop offered internally per user group by June, 2026 ii) At least two external capacity building workshops attended by ICT staff annually by June, 2026

4.6 Content Development and Communication

Content development and communication prescribes how digital contents developed at the University are to be disseminated to stakeholders.

Strategic Objective: Development and communication of digital contents to the public improved.

Strategies	Targets
a) Mechanisms to ensure quality of digital contents developed	i) Team to ensure quality of digital contents formulated by June, 2022 ii) All digital contents approved by the team

		before being disseminated to public by June, 2026 iii) Feedback mechanisms concerning disseminated contents instituted by June, 2022
b)	Designated personnel dealing with content creation and dissemination equipped with relevant skills and tools	i) Working tools for content creation and dissemination acquired by June, 2023 ii) Personnel dealing with content creation and dissemination attend workshops and trainings regularly by June, 2026

4.7 Data Communication Networks

Data Communication Networks determine how the University provides a resilient, secured and stable fast data communications network and services to facilitate the processing and accessing of Information related to various needs of the University.

Strategic Objective: Resiliency, stability and higher uptime rates of data communication network services ensured

	Strategies	**Targets**
a)	Network performance improved	i) Internet bandwidth increased from 90Mbps to 500Mbps by June, 2026 ii) Tools to monitor and documenting the University network performance acquired by June, 2023
b)	Central Data Repository Established	i) Central repository for hosting university website and managing databases established by June, 2026

4.8 Electronic Services Provision and Management

Electronic Services and Management suggests the need for the University to reduce the paper usage and manual work by digitizing its processes/functions

Strategic Objective: Provision and implementation of electronic service management process and procedure enhanced

Strategies	Targets
a) Establishment of electronic management system (EMS)	i) EMS to replace the manual work acquired by June, 2026 ii) Technical support system with approved ICT procedures established by June, 2026 iii) Mechanism to protect all the electronic services against cyber-security risks established by December, 2022
b) Awareness and Capacity building towards EMS usage	i) Awareness about electronic services among various categories of users raised by June, 2026 ii) Resourcesto provide a full-time ICT technical assistance acquired by June, 2026

4.9 Telecommunications and Unified Communications

The University intends to establish a secure and stable unified communication system to support the University functions.

Strategic Objective: Unified Communications service, on a digital network to provide secure, convenient and highly available communication implemented.

Strategies	Targets
a) ICT enabled	i) Videoconferencing facilities acquired and

communication service implemented and improved	installed by June, 2024 ii) A Call Centre to respond to client's queries and enquiries established by June, 2024 iii) Formal plan for maintenance, upgrade and monitoring of communication service usage instituted by June, 2022

4.10 Special Needs ICT Usage

Special needs ICT usage stipulates mechanisms for provision of ICTs working environment that supports people with special needs.

Strategic Objective: Mechanisms to ensure ICTs usage by people with special needs implemented

Strategies	Targets
a) Access to ICTs by people with special needs provided	i) Appropriate technologies aligned to needs of special user groups identified by June, 2026 ii) Appropriate access to special user groups on all ICTs products and services provided by June, 2026

4.11ICT Infrastructure Maintenance and Management

ICT Infrastructure Maintenance and Management aims at ensuring that all ICT facilities are regularly maintained to ensure all systems operate smoothly with less downtime.

Strategic Objective: Regular maintenance of ICT facilities undertaken

Strategies	Targets
a) Working tools for maintenance of ICT facilities acquired	i) Working tools required to undertake maintenance of ICT facilities acquired by June, 2023

b) Maintenance plan for ICT equipment operationalized	i) Maintenance plan for ICT equipment prepared and operationalized by June, 2023 ii) Programme to renovate and/or replace obsolete and/or outdated ICT equipment instituted by June, 2023

4.12 ICT Security and Safety

The objective is to give high priority to preventing threats thereby ensuring the safety and security of ICT facilities.

Strategic Objective: Proper ICT security and safety procedures and disaster recovery plans developed

Strategies	Targets
a) ICT security and safety ensured	i) Off-site backup service established by June, 2022 ii) Server room standardized by June, 2023 iii) Intrusion detection and prevention system acquired by June, 2023 iv) Procedures for removal of the licensed software and confidential data prepared by June, 2023

5. ICT STRATEGY IMPLEMENTATION

While ICT is a strategic enabler affecting all aspects of MoCU operations, the Department of ICT shall be the focal point in the implementation of this strategy and responsible for working very closely with other Departments/Units in all Faculties and Directorates in initiating, implementing, and monitoring ICT projects.The roles of the Department of ICT shall also include, among other things, management, control and maintenance of the University network, ICT systems and security, end-user support, and training. The implementation plan will be carried out in phases based on priority and shall be reviewed when such a need arises.

5.1ICT Strategy Implementation Critical Success

The success of ICT strategy implementation requires high levels of coordination within MoCU as well as with other stakeholders. Table 3 highlights some of the key critical success factors.

Table 3: Analysis of Critical Success Factors (CSF)

S/N	Critical Success Factors	Impact	Requirements
1	User involvement	Obtaining more accurate user requirements as well as making users have the sense of ownership of the process and its output	User centred requirements
2	Team work	Boosts creativity, productivity, engagement, communication, and efficiency amongst team members	All stakeholders get involved in setting plans and in execution of those plans
3	Management Support and Commitment	Encourage Deans, Directors and HoDs to actively engage with ICTs issues at the University. Provide funds to support ICT activities	Management be fully aware of aware of ICT plans and indorse the plans
4	Sufficient expertise and competence of ICT personnel	Improved performance as it is easy to achieve set out goals	Regular trainings

5	ICT skilled users	Effectively use available ICT products and services for improved productivity of the University	Regular in-house trainings
6	Clear goals	Progress monitoring as what is to be accomplished is clearly known	Corporate strategic plan; ICT strategy

5.2Analysis of Risks

The perceived risks are categorized into two aspects; delivery risks, that is mainly associated with strategy not delivering the promised capabilities and benefits risks, which is mainly concerned with not reaching the expected benefits. The analysis based on likelihood of occurrence, impact and its mitigation plan as described in Table 4.

Table 4: Anticipated Risks

S/N	Risk Description	Likelihood	Impact	Mitigation Measures
1	Software security issues (vulnerabilities and threats) e.g. cyber-security attacks, configuration mistakes, equipment failures	High	• Loss of data • Breach of confidentiality of data • System delay/Unavailability • Theft of monetary things • Modification of data	• Securing the web-servers, computers and network • Introducing IPS and IDS • Multi factor authentication • Updating/upgrading software patches to newest versions • ICT best practises should be followed by all users (i.e. ensuring password policy is enhanced)
2	Absence of Business Continuity Plan (BCP)	High	• Failure of Business operations continuity • Financial Loss • Tarnished	• Availability of BCP • Recovery strategies plan • Performing BCP audits

S/N	Risk Description	Likelihood	Impact	Mitigation Measures
			brand reputation • Data loss • Loss of clients	• Testing
3	Natural disasters(floods, fireoutbreak, earthquakes and hurricanes)	Medium	• Loss of Data • Infrastructure distraction	• Risk transfer • Offsite backup • Provision for disaster recovery plan
4	Strategic Risks (Technological changes, Stakeholder pressure, Competitive pressure, Regulatory changes, Consumer preferences changes)	Medium	• Cost • Business discontinuity	• Contingency plans • Institute change management • Aligning with technology trends
5	Reputational risks	Medium	• Lower performance	• Maintaining proper standards in all operation used to deliver services • Legal consideration to defend the University

5.3 Implementation Enforcement and Review

a) This document shall come into operation once approved by the University Council.

b) The strategies in this document provide top level issues for a common understanding of adoption and usage of ICT and delivery of ICT services at MoCU

c) This strategy shall be used in conjunction with the University's ICT Policy and Procedures, 2019 to ensure that it is operated within a well geared MoCU ICT governance ecosystem.
d) All employees and other authorised users of MoCU ICT services shall comply with the requirements of this strategy.
e) This document shall be reviewed from time to time when needs arise.

Appendices

Appendix I:Logical Framework

Focus areas, objectives, Targets and Key Performance Indicators (KPIs)

Focus Area	Objective	Targets	KPIs
ICT Infrastructure Development	a) ICT infrastructure in all buildings installed	i) Inter-buildings fibre connection installed by June, 2026.	• Number of buildings connected with fibre
		ii) The mechanism for ensuring the provision of ICT infrastructure during the construction of new buildings defined by June, 2022	• Available ICT infrastructure in new buildings
	b) Accessibility of ICT infrastructure ensured	i) wireless access points to cover the entire campus installed by June, 2026	• Wireless access points coverage
		ii) Off the site backup service established by December, 2022	• Available off the site backup
Access and Usage of ICT Facilities	a) Appropriate and Responsible access and use of ICT resources and services enhanced	i) Access control mechanism to identify the eligible person to access and use ICT facilities defined and implemented by December, 2022	• Available access control mechanisms
		ii) Access and usage of	• Eligibility and

Focus Area	Objective	Targets	KPIs
		ICT facilities eligibility and restrictions criteria defined and implemented by June, 2026	restrictions criteria
		iii) Tools for monitoring of ICT equipment connected to university network acquired by December, 2022	• Number of Monitoring tools
		iv) Mechanisms to ensure users who access ICT resources and services use them as per their roles implemented by December, 2022	• User segregation matrices
Software Development and Acquisition	a) In-house software development managed	i) Guidelines for in-house software development prepared and operationalized by June, 2023	• Software development Guidelines
		ii) Intellectual property rights protection of the available in-house developed software acquired by June, 2026	• Acquired intellectual property rights

Focus Area	Objective	Targets	KPIs
	b) Software outsourcing improved	i) Guidelines for software outsourcing prepared and operationalized by June, 2023	• Software outsourcing Guidelines
ICT Procurement	a) A tool to guide the procurement of ICT tools and services developed	i) Guideline for procurement of ICT tools and services developed and operationalized by June, 2023	• Procurement of ICT tools and services Guidelines
	b) ICT facilities inventory control developed	i) All available ICT equipment verified by June, 2026	• Verification Report
		ii) ICT inventory prepared by June, 2026	• Inventory Report
	c) Guidelines to dispose obsolete ICT equipment developed	i) Guidelines to dispose obsolete ICT equipment developed and operationalized by June, 2023	• Guidelines to disposing obsolete ICT equipment
ICT Skills Capacity Building	a) Skills needs assessment conducted	i) Survey to establish ICT skills gaps amongst different user groups conducted by December, 2022	• Survey reports
		ii) Skills need assessment plan	• Assessment plan available

Focus Area	Objective	Targets	KPIs
		prepared by December, 2022	
	b) ICT skills capacity enhanced	i) At least one internal capacity building workshop conducted annually per user group by June, 2026	• Workshop report
		ii) At least two external capacity building workshops attended by each ICT staff annually by June, 2026	• Workshop report
Content Development and Communication	a) Mechanisms to ensure quality of digital contents developed	i) Team to ensure quality of digital contents formulated by June, 2022	• Constituted team
		ii) All digital contents approved by the team before being disseminated to public by June, 2026	• Approval reports
		iii) Feedback mechanisms concerning disseminated contents instituted by June, 2022	• Available feedback mechanisms

Focus Area	Objective	Targets	KPIs
	b) Designated personnel dealing with content creation and dissemination equipped with relevant skills and tools	i) Working tools for content creation and dissemination acquired by June, 2023	• Acquired working tools
		ii) Personnel dealing with content creation and dissemination attend workshops and trainings regularly by June, 2026	• Number of personnel trained
Data Communication Networks	a) Network performance improved	i) Internet bandwidth increased from 90Mbps to 500Mbps by June, 2026	• Available bandwidth
		ii) Tools to monitor and documenting the University network performance acquired by June, 2023	• Acquired monitoring tools
	b) Central Data Repository established	i) Central repository for hosting university website and managing databases established by June, 2026	• Established central repository
Electronic Services provision and	a) Electronic management system (EMS)	i) EMS to replace the manual work acquired by June, 2026	• Available Electronic services

Focus Area	Objective	Targets	KPIs
Management	established	ii) Technical support system with approved ICT procedures established by June 2026	• Available technical support system
		iii) Mechanism to protect all the electronic services against cyber-security risks established by December, 2022	• Available protection mechanisms
	b) Awareness and Capacity towards EMS usage created	i) Awareness about electronic services among various categories of users raised by June 2026	• Number of awareness programmes
		ii) Resourcesto provide a full-time ICT technical assistance acquired by June, 2026	• Available resources
Telecommunications and Unified Communications	a) ICT enabled communication service implemented and improved	i) Video conferencing facilities acquired and installed by June, 2024	• Available video conferencing facilities
		ii) Call Centre to respond to clients' queries and enquiries established by June, 2024	• Established Call Centre

Focus Area	Objective	Targets	KPIs
		iii) Formal plan for maintenance, upgrade and monitoring of communication service usage developed by June, 2022	• Maintenance and monitoring plan
Special Needs ICT Usage	a) Access to ICTs by people with special needs provided	i) Appropriate access for special user groups for all ICTs provided by June, 2026	• Number of ICT services accessible
ICT Infrastructure Maintenance and Management	a) Working tools for maintenance of ICT facilities acquired	i) Working tools required to undertake maintenance of ICT facilities acquired by June, 2023	• Available maintenance tools
	b) Maintenance plan for ICT equipment operationalized	i) Maintenance plan for ICT equipment prepared and operationalized by June, 2023	• Maintenance plan
		ii) Programme to renovate and/or replace obsolete and/or outdated ICT equipment instituted	• Assessment plan

Focus Area	Objective	Targets	KPIs
		by June, 2023	
ICT Security and Safety	a) ICT security and safety ensured	i) Off-site backup service established by June, 2022	• Available off-site backup service
		ii) Server room standardized by June, 2023	• Standardized server room
		iii) Intrusion detection and prevention system acquired by June, 2023	• Intrusion detection and prevention system
		iv) Procedures for removal of the licensed software and confidential data prepared by June, 2023	• Software removal procedures

References

1. Moshi Co-operative University (2019). ICT Policy and Procedures, 2019
2. Moshi Co-operative University (2021). Five-Year Corporate Strategic Plan, 2021/2022 – 2025/2026
3. United Republic of Tanzania (2016). National Information and Communications Technology Policy 2016. Ministry of Works, Transport and Communication.
4. United Republic of Tanzania (2016). National Information and Communications Technology Policy 2016: Implementation Strategy 2016/17 – 2020/21. Ministry of Works, Transport and Communication.