MAKERERE UNIVERSITY - DIRECTORATE FOR ICT SUPPORT (DICTS)

STRATEGIC PLAN 2020-2030

December 2018

Table of Contents

LIST OF TABLES:

LIST OF FIGURES:

ACRONYMS

CAD	*Computer Aided Design*
CAM	Computer Aided
CEDAT	Collect of Engineering Design Arts and Technology
CEES	College of Education and External Studies | Makerere University
COCIS	College of Commuting and Information Science
DICTS	Directorate for Information Technology and Communications Support
E-LEARNING	Electronic Learning or E-Learning
E-WASTE	Electronic Waste
EA	Enterprise Architecture
EAC	East African Community
eduroam	Education Roaming
EGIP	Edinburgh Glasgow Improvement Programme
EPICA	Strategic Partnership for the Co-Design of an Innovative and Scalable ePortfolio
HEST	Higher Education Science and Technology
HPC	High Performance Computing
ICT	Information and Communications Technology
ITS	Integrated tertiary software
LAN	Local Area Network
MAK	Makerere University
MAKIR	Makerere Institutional Repository
MOFPED	Ministry of Planning Finance and Economic Development
MOICT	Ministry of Information Communications and Technology
MOU	Memorandum of Understanding
MUELE	Makerere University E-Learning Environment
NDP	National Development Plan
NITA-U	Nation Information Technology Authority of Uganda
NOC	Network Operation Centre
NORPART	Norwegian Partnership Programme for Global Academic Cooperation
NREN	National Research and Education Network
ODEL	Open Distance And E-Learning
PDU	Procurement and Disposal Unit
PEBL	Partnership for Enhanced and Blended Learning
PPDA	Public Procurement and Disposal Authority
PPDU	Public Procurement and Disposal Unit
PWDS	Persons with Disabilities
R&D	Research and Development
RENU	Research and Education Network for Uganda
Sida	Swedish International Development Cooperation Agency
VULA	Virtual Unbundled Local Access
WAN	Wide Area Network

1 INTRODUCTION

1.1 BACKGROUND

Makerere, the oldest and most renowned University in Uganda, has over the years enjoyed the top position in the Universities' ranking in the country, and has been consistently among the top ten in Africa. This has been achieved by, among others, identifying and adopting ICTs in the mainstream Universities core activities of teaching and learning, as well as research and innovation. The role of the ICT function in determining the performance and visibility of the University cannot be underestimated. With increased demand for higher education, ICT provides an enabling environment and facilitates access to knowledge, learning and innovations to enable the University offer globally competitive programs.

Section 41(e) of the Universities and other Tertiary Institutions Act 2006 empowers the University Council to establish departments and units that can assist it to achieve its mission. On this basis, it established the Directorate of ICT Support on 2001, to function as the driver for the ICT agenda in the University. In line with these aspirations, the Makerere University Strategic plan 2008/09 -2018/19 recognizes the key role that ICT would play in ensuring quality, effectiveness and efficiency in all the University's undertakings in order to realize her strategic focus.

Cognizant of this important role of ICT and noting the dynamic technological advances, DICTS is committed to continually develop and regularly review its ICT Strategic Plan to guide in the design, development, implementation, and effective use of the ICT services and resources.

The 2020-2030 DICTS Strategic Plan is based on Makerere University's recognition of the role of knowledge as a necessary basis for sustainable human capacity development. It therefore articulates how ICT will be harnessed to support the core functions of research, teaching and learning, by ensuring optimum user experience, setting up appropriate ICT structures to spur innovation, as well as supporting the roles of all the players in the University's ecosystem. Its implementation will usher in the far-reaching changes that are needed to achieve knowledge for all in the new Knowledge Economy, while at the same time modernizing the Management Information Systems to the expected and required standard of a modern University.

The planning process for the 2020-2030 DICTS Strategic Plan was kick started by creation of a steering committee. The committee developed a Strategic Plan framework that included Strategic themes and Strategic Objectives.

In line with the university's vison of becoming a thought leader for knowledge creation and society transformation for development, the DICTS strategic Plan, will strongly support the university to deliver on Uganda's development agenda, which considers ICT as one of the key pillars for National development.

1.1.1 VISION 2040 ASPIRATIONS:

Vision 2040 recognizes that "ICT has enormous opportunities that Uganda can exploit to transform the economy and peoples' lives through job creation acceleration of economic

growth and significantly increased productivity". It recognizes further that ICT can "improve national productivity by making government and business enterprises more efficient, effective and globally competitive". It also emphasizes that there is "potential to improve availability of digital content and e-products, automation of government processes and inter-agency connectivity, innovation, bridging the gap between industry and academia, and commercialization of research and development".
Other quotes from the document are that:

- "Uganda shall develop, improve and retool its ICT talent pool by building mechanism by adopting globally benchmarked, industry-rated skills assessment and training and certification standards. The curriculum and learning content will also be progressively reviewed and developed in order to align what students are taught with what industry globally requires. It shall be mainstreamed in education to take advantage of E-Learning and to prepare future generations of ICT-savvy workers and ensure their effective utilization".
- "Uganda shall continuously build robust ultra-high speed, pervasive, intelligent and trusted infrastructure all over the country in line with the changing technologies".
- "Government will encourage innovation to harness the full potential of the digital economy and technological innovation. The aim is to stimulate growth, innovation and employment through digital content creation, software development for local and regional markets, creative industries, multimedia, Computer Aided design and Manufacturing (CAD/CAM) and other technologies that will emerge over the period".
- "Ultimately, Uganda shall catalyse a "whole-of-Government" transformation by putting online as many services as possible, automating work functions and reducing paperwork for greater internal efficiencies. The expected result of these efforts will be better service delivery, open engagement of Government and significant improvement in Government operations".

1.1.2 NDPII 2015/16 -2019/20 ASPIRATIONS:

According to the Current National Development Plan (NDPII), the ICT sector is required to facilitate sustainable, effective and efficient development through harnessing and utilizing ICT in all spheres of life. To meet the sector and NDPII targets, the key focus areas include:

- Collaborative development of an interoperable and secure ubiquitous ICT infrastructure
- Increasing access to ICT infrastructure to facilitate implementation of the development priorities
- Creation of an enabling environment that is aligned to emerging technological changes
- Enhancing integration and automation of E-Government services and positioning Uganda competitively in the global market
- Enhancing capacity for local content development and usage in the various ICT sector services
- Development of quality ICT human capital stock to meet the industry demands for ICT skills and support R&D for job creation
- Improving the information security system to be reliable, resilient and capable of responding to cyber security threats
- Improving the legal and regulatory frameworks to respond to industry needs

1.2 MANDATE

To be a central service unit, providing and (or) developing ICT services and offering expert guidance to all academic and administrative processes within the University.

1.2.1 OUR VISION

To provide university-wide access to, and utilisation of Information and Communication Technology to enhance the position of Makerere University as a Centre of academic excellence, and its contribution to the sustainable development of Society

1.2.2 OUR MISSION

To ensure high and sustainable availability of ICT resources that are responsive to the needs of the university and beyond through quality management, control and maintenance processes that are customer oriented.

1.2.3 CORE VALUES

DICTS abides by the following University wide core values:

i. Allegiance to the institution
ii. Integrity
iii. Customer responsiveness
iv. Professionalism and
v. Openness to diversity.

2 CONTEXTUAL ANALYSIS

2.1 PERFORMANCE REVIEW (PREVIOUS SP AND BASELINE)

The performance evaluation for the years 2014 to 2018 is based on the Makerere ICT Strategic Plan (2008/9-2018/19), the Makerere ICT Policy (2010-2014), the revised Makerere ICT Strategic Plan (2016– 2021) and the updated Makerere ICT Policy.

ICT funding between 2014 and 2018

Year	2014/15	2015/16	2016/17	2017/18	2018/19
Internally generated funds (Makerere budget)	2,193,000,000	2,193,000,000	2,193,000,000	3,689,645,608	
Sida funding	750,000,000	1,500,000,000	700,000,000		
Government of Uganda		100,000,000			
HEST AfDB Project	3,000,000,000				

The Directorate for ICT Support (DICTS), provisioned ICT services to the Makerere University community over the last five years with an annual average budget of approximately 2,500,000,000/= from internally generated funds of which;

i. 1,825,000,000/= per annum is paid for bandwidth.
ii. 300,000,000/= per annum is paid for Licences.
iii. 375,000,000/= for unit activities

The 375,000,000/= for unit activities, covers welfare, salaries, fuel, generator and motor vehicle repairs and maintenance thus leaving very little towards repairs and maintenance of core ICT infrastructure which is largely obsolete and needs to be revamped. Additionally, the overall ICT budget, is less than 1% of the entire university budget which is way below the recommended 4-5% of the entire University budget being dedicated towards ICT support.

The progress achieved in improving both the core and end-user ICT infrastructure has been largely funded by Sida, NORAD and the HEST AfDB projects. This has resulted into lack of a clear ICT sustainability plan on the part of the University due to donor dependency, which has in turn resulted into obsolete ICTs within the University.

ICT ACCOMPLISHMENTS FOR THE YEAR 2014/15 to 2018/19

The Makerere ICT accomplishments are based on three key categories;

1. Infrastructure (core infrastructure, logical infrastructure & end-user infrastructure).
2. Systems & Software platforms including databases.
3. Capacity building

Year	Service procured and (or) implemented	Baseline	Achievement
2014	NetApp System procured and installed	100Mb Mail quota for each Makerere user.	• Mail quota for Mak-users increased by 400%.

			•
	Procured institutional bandwidth from the Research Education Network Uganda (RENU)	68 Mbps/month	• Bandwidth has increased to the current 1300 Mbps for the same budget resulting into improved user experience, enhanced online collaboration and online visibility for Makerere University.
	Additional servers procured for MUELE (The Makerere University E-Learning Environment)	Moodle E-Learning Software	• Improved resilience of the MUELE platform in supporting E-Learning at Makerere. • Increased usage of the MUELE platform.
2015	Installation of a Telecom Grade Mast for wireless blanket on University campus.	34 wireless access points at various locations on University campus	• Enhanced wireless coverage across the main University campus. • Improved online visibility for Makerere University users. • Improved uptake and usage of Makerere University ICT services. • Enhanced research visibility.
	32 thin-client computers procured University internet kiosks	Obsolete computers in the 6 internet kiosks within the University.	• Enhanced uptake and usage of Makerere University ICT services. • Increased access to, and usage of E-educational services by the Mak-student community.
	Makpay API interace linking banks to university financial sytems developed and implemented.	Disintegrated Financial Information Systems.	• Automated transfer of tuition payments between banks and the University Financial Information Systems. • Increased transparency in University financial processes. • Timely report generation for decision makers.
2016	Procured high-end servers for vitualization.	Unvirtualized server environment.	• Better utilization of servers within the University and increased capacity to support University research projects.
	Digitized Human resource records in the central registry and automated file tracking.	Manual handling of Human Resource records.	• Improved efficiency in Human Resource Records handling. • Improved storage of Human Records for Makerere University staff.
2017	30 core switches procured	Obsolete core switches at most locations within University campus.	• Improved user-experience for Makerere users. • Improved uptake and usage of Makerere ICT services.
	Procured CCTV for DICTS Network Operation Centre	Lock and key security system.	• Improved security of the University Network Operations Centre.
	Connection of the Jinja-campus, Lira E-Learning centre and University Hospital to the RENU network.	All Makerere satellite campuses not linked to the main campus.	• Main campus and satellite campuses on same network with all users being able to access and use intranet services. • Improved uptake and usage of

			Makerere ICT services.
	Additional wireless access-points procured and installed at various locations within the University.	Wireless Access points	• Improved access to Makerere E-educational resources.
	Bulk procurement of Desktop computers for user units across University campus.	Procurement of ICT equipment in Silos.	• Improved standardization of ICT equipment across University campus.
	Implementation of the Academic Information Management System (AIMS) at Makerere	ITS, Results System	• Integrated Academic Management ERP resulting into automation of student management processes within the University. • Improved efficiency and transparency in student management processes. • Timely report generation for decision makers within the University.
	Procured IP block-space for Makerere University.	RENU IP block space.	• Access free local traffic by peering directly with the Uganda Internet Exchange Point (UIXP). • Better utilisation of bandwidth resources procured from RENU. • Improved research visibility for the Makerere users. • Improved user experience for Makerere users.

CHALLENGES AND RECOMMENDATION

The challenges affecting ICT at Makerere fall broadly in 4 categories of ;

1) Limited funding.
2) Disintegrated Information Systems.
3) Staffing.
4) Obsolete ICT infrastructure.

Challenges		**Recommendation**
Limited funding	i. The ICT budget for the financial year **2017/18** was **3,689,645,608/=** while the ICT budget for 2018/19 is **2,915,978,851/=** billion shillings which is a shortfall of **773,666,757/=** in ICT funding. This will greatly affect all ICT service improvement plans and equally increase the cost of revamping ICT infrastructure in the long term. ii. The aforementioned budget is for cross-cutting ICT services and does not cater for ICT support requirements of funded research projects. iii. Approximately 85% of all core ICT Infrastructure and Information Systems within Makerere have been donor funded over the years. Currently, donors are not funding	i. Increase the annual ICT budget to a minimum of **3,500,000,000/=** billion shillings with **1,000,000,000/=** clearly ear-marked for gradually revamping the core ICT infrastructure. ii. Implement council policy of 1% contribution towards ICT support for all funded research projects within the University to cater for their requirements without affecting the quality

		ICT infrastructure developments and expect Makerere to develop and implement a sustainable ICT Infrastructure and Information Systems Maintenance Plan. iv. All donors or bilateral development partners now expect the University to cost-share on all funded ICT interventions as part of a sustainability model which was not previously the case.		and grade of service for cross-cutting ICT services.
Disintegrated Information Systems	v.	ITS, Results Management System, Transcript System etc. are not able to "talk" to each other resulting into challenges of data inconsistency, delayed processing and limited access to wholistic information/reports for decision makers.	iii.	Implement the Academic Information Management System (AIMS) to completion. AIMS is an end-to-end integrated academic management information system which will integrate with IFMS and the Government IPPS system. This will improve transparency and also increase efficiency. All other information systems within the University should be integrated based on the approved University-wide Integrated Management Information Systems Framework (IMIS).
Staffing	vi. vii.	The University-wide ICT staffing is lean compared to the number of users and growing number of Information Systems and services requiring support. 80% of all ICT staff at colleges and 3 at the centre (DICTS) have been working on 6 months renewable contracts for close to 10 years.	iv. v. vi.	Formalise ICT staff within the University system with uniform 4 year contracts renewable based on satisfactory performance. Officially communicate council decision on all ICT personnel within the University belonging to DICTS. Implement ICT staffing recommendations that resulted from the **Mak-ICT staffing analysis exercise** and were shared with the Human Resource Director, the VC, DVCFA and University Secretary.
Obsolete ICT Infrastructure	vii.	Most ICT Infrastructure (both core and end-user) is obsolete.	viii. ix.	Increase the annual ICT budget to a minimum of **3,500,000,000/=** billion shillings with **1,000,000,000/=** clearly ear-marked for gradually revamping the core ICT infrastructure. Implement council policy of 1% contribution towards ICT

		support for all funded research projects within the University to cater for their requirements without affecting the quality and grade of service for cross-cutting ICT services.

2.2 SITUATIONAL ANALYSIS

As an input into the development of DICTS Strategic Plan 2020 – 2030, an exercise was undertaken to establish the current status of ICT deployment and usage in the University. The analysis was based on the five Strategic Objectives of the Makerere University ICT Strategic Plan 2015/16 to 2019/2020 as reviewed in February 2018. These are:

- Improving ICT management and Organizational Context
- Enhancing Research and Innovation
- Enhancing the Teaching and Learning Support Environment
- Building a Robust ICT Infrastructure
- Enhancing ICT Inclusiveness and Gender Mainstreaming.

As a means to obtain the information required, Management of the Directorate identified an ICT expert to undertake the exercise. Consequently, a questionnaire was designed along the above themes of the DICTS Strategic Plan and their respective Strategies. It was administered to the Director DICTS Mr. Mugabi Samuel Paul, the Deputy Principal of College of Education and external Studies, Dr. Muyinda Paul Birevu, the Ag. Director Gender, Dr. Euzobia Baine, and a number of System Administrators and other user in Colleges and administrative Units. The information that was gathered was synthesized and is presented below in the Situational Analysis.

2.2.1 Improving ICT management and Organisational Context

2.2.1.1 Putting in place a Vice Chancellor's level ICT Committee to guide management of ICT issues:

The Committee is not in place. The view of Council and management is that the Council Committee on ICT, QA and Gender is sufficient, while that of DICTS management is that a VC/Management level committee is still necessary because it would be nearer to the ground, rather than a Council Committee that meets once quarterly.

2.2.1.2 Percentage of the university budget that goes to DICTS and the extent to which the approved budget is allocated:

About 1% was allocated in current Financial Year. The technology fee is not ring fenced. In the current FY, Ugx.2.9 billion was allocated, but of this amount, Ugx. 1.825 goes to purchase bandwidth. The balance goes towards salaries, infrastructure maintenance, fuel etc. Management has promised an extra Ugx. 1 billion next FY. Boarder router is being acquired at Ugx. 500 million off the Presidential Initiative Fund.

2.2.1.3 Formalization of employment terms for staff who have been on renewable short term contracts:

Some staff members are still on short term contracts. Appointments Board is in the process of phasing out all stop gap contracts by the end of December 2018.

2.2.1.4 Existing Management Information Systems and the extent to which they have been integrated and made interoperable:

For about 15 years Makerere was using integrated ITS supplied by a South African Company. It was never implemented fully mainly due to unsustainable support costs and attempts to phase it out have been around since 2008. It was supporting the Academic Registrar's, Finance Departments and Human Resource Department. Presently, AIMS is being implemented after Government first attempted the implementation of CEMAS. About two years ago, Government took a decision to abandon CEMAS and substituted it with AIMS, which is a home-grown solution. The main reason behind this decision is that support will be available locally and at a much lower cost. It has the functions of Academic Registrar, Finance, and when fully implemented is expected to support the HR and Library functions as well. Payroll is managed through IFMS and IPPS, which are integrated with AIMS. VITUA Library System is in place and its annual license fees have always been covered by Sida. Sida support is phasing out in 2020. There is an attempt to migrate to Koha, an open source Integrated Library Management System. The Library fee like the Technology fee, is also not ring-fenced and therefore sustainability remains a challenge.

2.2.1.5 Allocating sufficient resources to ensure that research is supported:

The sharing formula for ICT resources is in place but does not prioritize research. Under the current Sida funded ICT project (2015-2020), Makerere is expected to demonstrate substantiality through a 50 50 sharing model with Sida.

2.2.1.6 Existence of Central Web Publishing facilities and the nature of support provided by DICTS:

An institutional research repository (MAKIR) exists in the Library and DICTS houses and maintains the servers as well as the web portals. DICTS also works with College Web Administrators to draw traffic to the repository. Mawazo Journal exists under College of Humanities and operationalization of the Makerere University Press is in the pipeline.

2.2.1.7 Having in place standards for digital content management systems:

Standards for digital content management systems exist. In terms of infrastructure standards, DICTS verifies compliance of ICT procurements. Arrangements for bulk purchase of ICT equipment such as computers are in place to benefit from economies of scale.

2.2.1.8 Enforcing ICT operational policies and standards:

Currently, DICTS is in the process of developing guidelines and procedures to help enforce the existing policies.

2.2.2 Enhancing Research and Innovation

2.2.2.1 Ring-fencing technology fee:

University Management already spends more on ICTs than the collections from technology fees. Even if it was ring-fenced, it would not be adequate, although it would be substantial.

2.2.2.2 Amount of bandwidth supplied to Makerere:

Makerere currently consumes 1310 mbps and this has been increasing annually as a result of Makerere being a member of an NREN that provides bandwidth to research and educational

entities at highly subsidized rates. However, despite that fact that there has been significant increase in bandwidth, it is still not sufficient to fully meet the research and learning needs of the institution.

2.2.2.3 Existence of high end computing facilities to support specialized research in the University:

Currently, Makerere does not have high end computing infrastructure to facilitate research that demands high computing capacity.

2.2.2.4 Number of academic staff involved in researching technologies aimed at improving teaching and learning:

All staff in ODEL are doing research on these technologies. There are 6 certified blended learning developers who have been trained through projects. 40 lecturers in CEES have been trained in E-teaching 1 (facilitating online) and E-Teaching 2 (E-Courseware development). There is a Project to leapfrog Distance Learning (1st generation correspondence education) to 4th and 5th generation (pedagogical online courses). Another project is EPICA whose goal is to enhance creative and visualization of skills amongst graduates using e-portfolio; it encourages use of competence-based learning practices. The other one is PEBL, which is a partnership for enhanced and blended learning by using technologies to share scarce lecturer resources within the EAC. Lastly, the other project is NORPART which uses EGIP to enhance mobility of staff and students between Uganda, Norway and Rwanda; enhance quality and internationalization of study programs through mobile transformative pedagogy.

2.2.3 Enhancing Teaching, Learning and Support Environment

2.2.3.1 Number of Makerere courses that are online:

As on 8th June, 2018, 777 courses were online, which is less than 10% of courses offered by Makerere. In 2016, there were less than half of these, so there has been some improvement.

2.2.3.2 DICTS defining minimum bandwidth to be used by students:

Video conferencing requires a lot of bandwidth, so does Skype and Hangout. Indeed, good bandwidth is required. DICTS has not defined minimum bandwidth. The problem is with the infrastructure to deliver it; the servers were installed in 2004 and the LAN is even older; there have not been any upgrades or replacements for the switches and routers or replacements of this old infrastructure.

2.2.3.3 Developing MUELE fully and increasing its rollout and adoption:

MUELE is based on Open Source Moodle platform and in 2018 DICTS upgraded it to Version 3.4 which is not the latest. Integration of MUELE with other systems in the University such as AIMS has not yet been done. Lessons have not been learnt from countries such as South Africa where they use VULA, which is the first call for students even before registration. DICTS is expected to provide good support so as to precipitate learning. E-Learning is handled by Institute of ODEL, supported by DICTS. DICTS provides technological backstopping, while ODEL is the professional driver in terms of helping units to pedagogically use the system. Institute of ODEL further provides training for lecturers to use the system and handles transformation of legacy systems into blended learning (online engagements plus mixing with face to face learning). The dream is to have fully developed online courses by somewhere between the 6th and 8th year of the new Makerere University Strategic Plan. The challenge is Pedagogical Affordances in terms of what MUELE can do in order to do E-Learning, e.g. synchronous communication.

2.2.3.4 Educational Roaming by staff and students:

Makerere does not subscribe to eduroam. When members of staff and students are abroad, they are disconnected. DICTS has not explored sorting out the subscription in terms a charge payable to a travelling lecturer as a standard arrangement to cater for communication, because it is a necessity.

2.2.3.5 Number of classrooms or lecture rooms that are equipped with E-learning facilities as well as number of wireless hotspots and their bandwidth capacity:

Nobody has carried out a survey to establish the number of E-Learning Compliant classrooms. Same applies to number of hotspots and their capacity.

2.2.4 Building robust ICT Infrastructure

2.2.4.1 Level of DICTS support to the Colleges and other Units:

DICTS provides cross cutting ICT services to colleges and administrative units an d while these services have gradually improved, we still have challenges of intermittent internet and mail services, limited Wi-Fi coverage. Administrators get support from DICTS when they escalate. Disposal policy is available under PDU but it is not being implemented; there is a lot of end-of life equipment around the Colleges.

2.2.4.2 Capacity development opportunities for ICT support staff at Colleges and Units:

There has not been any professional technical training provided to this cadre of staff not until 2018.

2.2.4.3 Providing access to high performance computing (HPC) ICT infrastructure to support research efficiently:

Currently there are no HPCs.

2.2.4.4 University-wide ICT Enterprise Architecture (EA) being in place:

This exists but has not been implemented.

2.2.4.5 Personal computing devices:

Taking CEDAT as an example, the estimate is that 75 and 80% of staff and students respectively have their own devices. For computer labs, the computer to user ratio is approximately 1:5 for students and 1:1 for staff.

2.2.4.6 Existence and status of a robust data centre:

A data centre is in place with local hosting. There is a mix of old and new servers. There is currently no cloud hosting.

2.2.5 Enhancing ICT inclusiveness and Gender Mainstreaming

2.2.5.1 Gender issues in DICTS

Presently, DICTS is not engendered and there is no affirmative action plan in place.

2.2.5.2 Frequency of workshops, conferences or seminars in to help sensitize women on the evolution of IT today and the role they can play in the growth of ICT:

There was an ICT project supporting training for women under Carnegie but it stopped in 2016. Currently there are no funds to support these workshops. There is a high demand for digital training schools especially the female students; there was an orientation program for first years that offered gender to be exposed to MUELE. This project could not proceed because the facilities were not enough and they were expensive.

2.2.5.3 Carrying out a situational analysis to establish the extent to which women are using existing ICT platforms:

A situational analysis to establish the extent to which women are using ICT platforms has not been carried out.

2.2.5.4 The University developing an ICT course for Gender and People with Disabilities and number of students are offering it:

There is a course that is offered at Gender, namely: Gender and ICT that is offered by 30 undergraduate students and about 20 graduate ones. One challenge is that there is scanty information about PWDS and the other one is that the facilities (chairs, computers, etc) that they use are expensive.

2.2.5.5 Ensuring that University labs cater for people with disabilities:

University labs currently do not cater for the PWDs.

2.2.5.6 Makerere having in place gender-specific indicators on ICT use and needs:

Gender-specific ICT Indicators are not in place.

2.3 SWOT ANALYSIS

	STRENGTHS	WEAKNESSES	EMERGING ISSUES
INTERNAL	▪ Improved ICT support from Management and council ▪ Well-built backbone infrastructure ▪ Diverse technical expertise ▪ Strong ICT strategic plan/policy ▪ Secured NOC ▪ Strong leadership ▪ Staff exposure to existing platforms ▪ Well documented business processes ▪ Enabling ICT structure ▪ Reasonable web publishing results ▪ Strong partnerships and collaboration with other educational Institutions ▪ Reputation of a premier university in Africa ▪ Availability of collegiate ICT labs ▪ Reasonable web publishing and staff and student web templates ▪ A wealth of information systems to support university operations. ▪ Strong student commitment for ICT utilization	▪ No consistent or lack of capacity building ▪ Slow response and or adaptation to ICT change/services/innovations ▪ High staff turnover ▪ Understaffed directorate for ICT Support ▪ Un-accounted for long working hours while supporting evening programs at MAK ▪ Obsolete infrastructure ▪ Expanding students demand for ICT Vs the limited resources / Infrastructure to respond to Students ICT demands ▪ Failure to enforce software acquisition policy ▪ Failure to ring fence the technology fee ▪ Limited institutional wireless network coverage ▪ Low awareness of available resources and technologies ▪ Lack of sustainability and knowledge transfer in university project both local and donor funded. ▪ Poor M& E in projects	▪ Enhance ICT support and awareness to both staff and students ▪ Develop and implement sustainability plans ▪ Engage M & E in all ICT projects ▪ Advocate for better employment terms with management ▪ Continued ICT infrastructure development
	OPPORTUNITIES	**THREATS**	

EXTERNAL	▪ Cloud computing ▪ Emerging technologies ▪ Management will ▪ Availability / exposure to top brains (students and staff) ▪ Existing international standards and linkages ▪ Government interests and support as well as educational development. HEST project ▪ R n D I.e. Bilateral products support ▪ Proliferation of mobile devices ▪ Improved communication services ▪ Emerging innovation hubs within the University ▪ existence of social network	▪ Poor perception of offered services and role of DICTS ▪ Inadequate financial commitments ▪ Lack of patriotism in decision making ▪ Fast changing ICT trends ▪ High cost of adoption ▪ Resistance and opposition to change ▪ Unattractive staff contracts ▪ Government directives ▪ Unplanned disruptions of university activities e.g. staff and student strikes ▪ Management commitment to ICTs ▪ Lengthy procurement processes affecting the work schedules ▪ Lack of pro-active ICT governance ▪ Internal politics ▪ Ever increasing cyber security threats ▪ Brain drain: better employment opportunities elsewhere ▪ ICT network and infrastructure not	▪ Advocate for staff training to keep up with emerging technological trends ▪ Continued engagement of Management to improving ICT funding ▪ Create a research and grants unit in DICTS to benefit from international collaborations ▪ Build mobile apps in line with the several information systems in the university ▪ Advocate for the development of a software development unit focused on home grown solutions. ▪ enhance MUELE to utilize social networks for content and information dissemination.

		sufficiently secured ▪ Increased competition from many private Universities (e.g. those that offer a laptop per student)	

Table 1: Detailed Swot with Emerging Issue

3 THE STRATEGIC FRAMEWORK

3.1 STRATEGIC POSITION

For the Planning Period 2020-2030, DICTS will strategically position itself to provide quality ICT services to university stakeholders and beyond it will require that DICTS is adequately funded and is well staffed. The emphasis is to ensure the provisioning of high quality and sustainable ICT services that are responsive to the needs of the University and beyond. The strategic plan which is based on three investment areas namely; Human capital development, development and institutional development is as follows.

3.2 HUMAN CAPITAL DEVELOPMENT

Table 2: Human Capital Development

Objectives	Strategies	Actions	Measures of success/verification
Teaching Learning and Support Environment			
To provide ICT platforms to facilitate all modes of learning and teaching activities at Makerere University	Build capacity in e-learning software and virtual classrooms	• Engage Makerere Research and software development community to develop e-learning software • Train lecturers and students in usage of virtual classrooms	• Number of e-learning software applications developers in the University • Range and quality of e-Learning software offerings • Number of lectures and students savvy with virtual classrooms
	Encourage collaboration between Makerere and other international universities through e-learning software	• Identify and engage potential collaboration partners	• Number of collaboration partners engaged
	Increase the number of classrooms or lecture rooms that are equipped with E-learning facilities and wireless hotspots	▪ Secure annual budget for equipping classrooms with e-Learning facilities ▪ Equip classrooms in each College and school with e-Learning facilities	▪ Amount of annual budget appropriated by management for this item ▪ Number of classrooms equipped with e-Learning facilities and wireless hotspots
	Ensure roaming for staff and students when they travel abroad.	• Engage University management to create roaming facility	• Establish whether functioning roaming profile is in place • Number of staff benefitting from the facility annually and cumulatively
	▪ Support the creation of a virtual library (VL)	▪ Provide the infrastructure for the	▪ Establish whether infrastructure for VL

		VL ▪ Support in Setting up virtual library website and uploading the e-library content	is in place ▪ Establish whether website with e-library content is in place ▪
	▪ Provide and support multimedia Instructional Technology & Management.	▪ Setup a multimedia studio for content generation ▪	▪ Establish whether multimedia studio is in place ▪
Mainstreaming Open Distance and E-learning Mainstreaming Open Distance and E-learning			
To provide a robust ODEL system	Develop and enhance MUELE and other e-learning software and ensure their complete rollout across the University.	▪ Enhance MUELE to use emerging technologies including but not limited to social media. ▪ Pilot and rollout the software ▪ Support and maintain the MUELE App	▪ Number of emerging technologies deployed to enhance MUELE ▪ Verify extent of roll out of the software in colleges and schools ▪ Verify level of support provided by DICTS to the MUELE App
Student Support Services			
▪ To create a conducive environment for student academic and social life.	▪ Enhance student access to ICT services	▪ Increase Wi-Fi coverage across the entire university ▪ ▪ Provide world-class internet access speeds in computer labs ▪ ▪ Establish a student support system	▪ Percentage of Wi-Fi cloud area coverage both on and off campus sites ▪ Speed of internet in Makerere computer labs compared to that in leading Universities' labs ▪ Verify level of student user experience in terms of support they get from DICTS
	▪ Establish a student support help desk to continuously engage students to improve information flow. ▪ ▪ Institute continuous ICT refresher training and create awareness for new technologies.	▪ Create help desks at strategic points in the university to support students on ICT related matters ▪ ▪ Develop and deliver student and staff refresher programs	▪ Number of functional student support help desks and their distribution across the University ▪ ▪ Number of students and staff who undergo refresher training annually and cumulatively

3.3 DEVELOPMENT IMPACT

Table 3: Development Impact

Objectives	Strategies	Activities	Means of verification
Research and Innovation			
To build sustainable ICT solutions that are responsive to the needs of research and innovations across the University	Build ICT support for research and innovations across the University	▪ Engage researchers across the University to identify gaps in the use of ICT support in research ▪ Explore mechanisms of further utilizing research educational networks that offer research collaboration related programs. E.g. Edu-roam and Federated Identity Management	▪ Number of researchers engaged to identify the said gaps ▪ Number of gaps identified by the researchers ▪ Number of gaps eliminated by DICTS ▪ Number of research networks collaborating with Makerere in the area ▪ Number and type of collaboration related programs
	Deploy emerging technologies including but not limited to social media to enhance research and innovations at the University	▪ Keep abreast of and document emerging technologies ▪ Deploy appropriate emerging technology ▪ Develop sensitisation training for researchers and innovators	▪ Number of emerging technologies identified and documented ▪ Number of emerging appropriate technologies deployed ▪ Number researchers and innovators aware of and using emerging technologies, including social media, in their work
	Build competencies for high performance computing across the university	▪ Build a robust data centre to support the local hosting environment as well as an HPC specialised research. ▪ Ensure availability of required infrastructure including not limited to storage, data management.	▪ Verify whether a robust data centre with these capabilities is in place ▪ Verify whether required infrastructure to support these requirements is in place
	Develop DICTS into a knowledge and research centre.	▪ Develop internal capacity for writing proposals for funding. ▪ Tap into research funds that may be available in the university and country.	▪ Number of DICTS staff capable of writing fundable proposals ▪ Number of fundable proposals written ▪ Amount of internal and external funding for research attracted into DICTS

Knowledge Technology Transfer and Partnership			
To enhance the capacity of DICTS to generate solutions that are responsive to societal needs	Strengthen the Makerere data Centre as a national research repository	▪ Engage MOICT, NITA-U and MOFPED to secure policy support for strengthening the Makerere data Centre ▪ Sensitize and build awareness among institutions involved in research for them to use the repository	▪ Establish level of support secured by DICTS from these targeted Government Institutions to strengthen the data centre ▪ Number of research institutions aware of and using the repository
To harness collaboration and partnerships with internal and external stakeholders in technology transfer	Establish incubation Centres and internships for student development through collaboration and partnerships	▪ Develop internship support strategy ▪ Engage potential partners to implement the strategy ▪ Set up and run the incubation centres	▪ Verify whether the internship strategy is in place ▪ Number of partners engaged to use the same ▪ Number of incubation centres set up ▪ Number of interns going through the incubation centres annually and cumulatively
To promote the generation of research and innovations and their accessibility to Ugandan society and beyond with a view of transforming the social and economic status	Position DICTS as an ICT think tank for Public and Private sectors	▪ Develop DICTS ICT think tank business plan ▪ Engage public and private sector for think tank partnerships ▪ Implement the business plan	▪ Verify whether think tank business plan is in place ▪ Number of partnerships with public and private sector for the same ▪ Establish level of implementation of the business plan
	Strengthen the use of ICT in research and innovation.	▪ Engage researchers across the University to identify gaps in the use of ICT support in research ▪ Identify appropriate interventions for eliminating the identified gaps ▪ Sustain the engagement with researchers	▪ Number of researchers engaged to identify the said gaps ▪ Number of gaps identified by the researchers ▪ Number of appropriate interventions identified ▪ Number of gaps eliminated ▪ Number of researchers engaged annually and cumulatively

3.4 INSTITUTIONAL DEVELOPMENT

Table 4: Institutional Development

Objectives	Strategies	Activities	Measures of Success
ICT Management and Organisation Context (Governance and Institutional Effectiveness)			
To build an engaged and highly motivated work force	Review the existing DICTS organizational structure to harmonize it with the current and future needs of the University	▪ Benchmark on organizational structures of similar units in peer universities ▪ Carry out a projection of likely future staffing needs ▪ Review DICTS Organizational structure	▪ Number of peer universities benchmarked on the same ▪ Verify whether projection of future staffing needs has been undertaken ▪ Verify whether the updated structure of DICTS is in place
	Provide nurturing and internship opportunities to outstanding students in ICT	▪ Design nurturing and internship strategy ▪ Market strategy to relevant stakeholders ▪ Implement the strategy	▪ Verify whether the internship strategy is in place ▪ Number of partners engaged to use the same ▪ Number of interns going though the incubation centre annually and cumulatively
	Provide opportunities for continuing professional development	▪ Identify staff training needs ▪ Design a training plan ▪ Identify/Secure funding for continuous staff training ▪ Implement training plan	▪ Verify whether a staff training needs assessment has been undertaken ▪ Establish frequency of the exercise ▪ Verify whether the staff training plan is in place ▪ Establish frequency of its review ▪ Establish amount of funding available for staff training ▪ Number of staff trained annually and cumulatively

	Introduce a Performance-based rewards System as a token of appreciation for excellence	▪ Implement performance appraisal regulations of the University ▪ Set up a reward mechanism for excellent performers	• Verify level of implementation of University staff appraisal regulations • Number of excellent performers rewarded annually and cumulatively
To Provide oversight in Monitoring and regulating the implementation of ICT activities	Establish an ICT Advisory committee at Top University Management Level	▪ Lobby the Vice Chancellor to establish the Advisory Committee ▪ Ensure heads of key University units are members of the Committee and that they attend regularly ▪ Provide Secretariat services to the Committee	▪ Verify whether VC level Committee is in place and is actively operational ▪ Verify whether Heads of Units are members and frequency of attendance of Head ▪ Confirm that DICTS is indeed the Secretariat
To support the university in establishing and implementing e-governance platforms	Ensure that all University Management Information Systems are integrated so as to improve efficiency and effectiveness in university business operations?????	• Develop and implement governance framework	▪ Verify whether a governance framework is in place ▪ Establish the level of its implementation annually
	Increase awareness and usage of integrated electronic platforms to all stakeholders	• Develop awareness strategy • Secure funds for implementation of the strategy • Implement the e-platforms awareness strategy.	• Verify whether awareness strategy is in place • Verify level of available funding for its implementation • Number of stakeholders fully aware of the strategy
	Institute mechanisms for generating income through ICT consultancies and services.	• Develop a business arm of DICTS • Set up the business arm	• Verify whether DICTS plan is business plan is in place • Establish types of businesses it is engaged in • Establish amount of funds it generates annually and cumulatively
Library Services and ICT			

To improve ICTs that support library services in the university and beyond			
	Establish a service desk for library ICT support	Create service desks at the library for ICT Support.	• Verify whether a functional Library ICT support desk is in place
	Support the automation and sustainability of library functions	Implement and maintain library information systems in a sustainable manner.	• Establish whether a functioning Library Information system is in place • Establish whether a sustainability strategy for the system is in place in terms of the requisite resources
ICT Inclusiveness and Gender Mainstreaming			
• To build capacity to support development of appropriate content, applications and services that meet needs of all stakeholders	• Ensure secure access to ICTs for women, men, and persons with special needs.	• Develop policy on equitable secure access to ICTS for all	• Verify whether policy on equitable access to ICTs is in place • Establish level of its implementation in all buildings and spaces of the University
	• Develop capacity for equitable utilization of ICT infrastructure and services	• Set up capacity building guidelines for equitable utilization of ICTs, infrastructure and services	• Verify whether capacity building guidelines for these areas are in place • Establish numbers of personnel to champion and oversee implementation of the guidelines • Establish level of their implementation
Infrastructure Development and Management			
To develop and generate maximum benefit from the university ICT infrastructure	Undertake continuous ICT infrastructure audit and systematically upgrade it to match the ever-changing technologies.	Develop a systematic ICT infrastructure audit and upgrade plan.	• Verify whether the infrastructure audit and upgrade plan is in place • Verify frequency of the ICT audit and upgrade exercise

	Acquire contemporary ICT technologies	Continuously track ICT infrastructure development trends watching to identify suitable latest technologies for Makerere	• Verify regularity of tracking of the ICT infrastructure trends • Verify whether the tracking is recorded • Verify which of the latest trends have been adopted and implemented by DICTS
	Adopt bulk purchases for ICT infrastructure to benefit from economies of scale	Engage Management and PDU to adopt a strategy for bulk infrastructure purchase	• Verify whether the bulk purchase strategy adopted by PDU and management is in place • Establish percentage of ICT equipment are purchase under bulk purchase arrangements annually and cumulatively
Allocation and Management of Financial Resources			
To develop and maintain an efficient financial management system	Develop, implement and maintain a functional and integrated financial management system	Develop a platform for allocating and managing financial resources	• Verify whether the platform for the same is in place • Establish level of its implementation regularly • Establish benefits gained through its implementation
Resource Mobilisation and Investment			
To widen DICTS financial resources	Strengthen collaboration and partnerships within and outside the University	▪ Identify potential collaboration partners both within and outside the University	▪ Establish number of partners both within and outside Makerere identified by DICTS
	Institute mechanism for generating income through ICT consultancies and services (cloud services).	▪ Develop a hardware and software servicing centre ▪ Create packages to support projects in DICTS as a consultancy ▪ Develop skill-based programs for graduates as a	▪ Verify whether hardware and software servicing centre is in place ▪ Verify whether project support packages are in place ▪ Establish number of skill-based programs

		consultancy	developed for graduates ▪ Verify number of graduates engaged in these consultancies
Internationalisation			
To Improve ICT infrastructure and services to support access by and for international stakeholders	Upgrade the University web portal and existing systems to accommodate international context	• Identify University web portal upgrade requirements • Engage stakeholders within the University to obtain smart content to upload on the web portal • Secure funding and Implement the upgrade	• Establish whether list of web portal upgrade requirements is in place • Establish number of stakeholders engaged • Verify amount of content uploaded • Establish level of funding and level of implementation
	Support automation and virtualization of administrative and academic services.	• Develop strategy for virtualization of administrative and academic services	• Establish whether the support requirements list is in place • Establish whether virtualization strategy is in place • Establish whether budget is in place and level of implementation
	Develop ICTs to support internationalization of teaching, learning and research	▪ Upgrade university web portal and existing systems to accommodate international context	▪ Verify whether the University web portal has the capacity to handle international context ▪ Establish frequency of the upgrades
Green Economy or Sustainability			
To develop sustainable ICTs which are adaptable to the environment	Promote virtualization of servers	▪ Develop and implement a server virtualization strategy	▪ Establish whether server virtualization strategy is in place ▪ Establish level of its implementation annually
	Adopt and Implement National Guidelines for proper E-waste management.	▪ Engage MOICT and NEMA to domesticate the E-waste guidelines in the University	▪ Verify whether these institutions were engaged on the E-waste guidelines ▪ Establish whether the guidelines were

		▪ Streamline with PDU to implement the guidelines in sync with PPDA disposal of Public assets provisions	domesticated by the University ▪ Verify impact of that engagement on the way Makerere deals with its E-waste annually
	Implement paperless strategies across the university	▪ Develop a University wide paperless strategy ▪ Secure funding and implement the strategy ▪ Strengthen the Makerere Data Centre as a national research repository ▪ Engage MOICT, NITA-U and MOFPED to secure policy support for strengthening the Makerere Data Centre	▪ Verify whether the University wide paperless strategy is in place ▪ Verify level of funding in University budget for implementation of strategy ▪ Verify level of savings gained through implementation of the strategy annually and cumulatively • Verify whether the Makerere Data Centre has the capacity to be converted into a National Research Repository • Verify amount of funding available • Verify the sustainability plan • Establish whether this engagement took place • Verify the benefits tapped by Makerere (DICTS) as a result of that engagement

4 OPERATIONAL FRAMEWORK AND BUDGET

Objectives	Strategy	Activity	KPI	Time frame 2020-2030										Budget UGX
				2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28	2028 /29	2029 /30	
To develop and generate maximum benefit from the university ICT infrastructure	Undertake continuous ICT infrastructure audit and systematically upgrade it to match the ever-changing technologies.	- Design, develop and implement a Centralized Data repository facility	- Centralized Storage system - Capability of querying huge amounts of data for reports from a single source - A low response time - Emergency of an official information centre for accurate university data references - The data warehouse acts as a hub, to facilitate the exchange of information between systems and therefore serves as the Institutions information infrastructure. - Reduces hard copies for information storage.											**7,000,000,000**
		-Design, develop and implement a Centralized Data backup and disaster recovery centre. - Upgrade the Data Backup and Disaster Recovery Centre.	- Quick Business Continuity providing access to critical applications. -Reduced business interruption; thereby allowing staff to focus on core-competencies - Quick failed server recovery - Quick and accurate recovery of services - Increased ICT service availability and up-time											**5,000,000,000**
		-Creating a virtualized computing environment of the Network operation centre (NOC) and	Optimised server resources -Availability of more rack space - Overall Ease of Management of											**3,000,000,000**

		Disaster Recovery Centre (DRC) -Virtualization of the NOC	server applications - Faster Service Deployment and Migration - Improved Staff Efficiency - Improved Mean Time to Repair (MTTR) - Reduced Frequency of Service Failures. - Improved server Performance - Easy server Manageability - Guaranteed Scalability for ICT applications - Reduced Total cost of hardware ownership - Actual resource utilization on of hardware.											
		Implement VoIP and Video Conferencing facilities across the University	- Reliable communication in the university. - Reduce overall university telephone bills. - Academic Video archives - Improved research content dissemination											**1,500,000,000**
		-Upgrade and extension of Campus wide Wi-Fi - Upgrade and extension of the optical fibre links to new construction areas	- reduced access complaints - Increased average network throughput for both upload and download of data. Increased on-line access. - Improved Average Wi-Fi Association/Connection Duration -Improved Wi-Fi Signal Strength and connectivity grade of service.											**5,000,000,000**
To provide ICT platforms to facilitate all	- Build capacity in E-learning	Design and Implement eLearning platform frame-work	-Improved teaching environment -Improved teaching approached -Improved reference to online											**3,000,000,000**

modes of learning and teaching activities at Makerere University	software and virtual classrooms. -Increase the number of classrooms or lecture rooms that are equipped with E-learning facilities and wireless hotspots		materials. -Easy sharing of resources and instructional materials. -more time spent on eLearning per platforms by students and lectures - more number of e-courses - Students are more engaged in activities, they show increased interest and demonstrate a longer attention span										
To build an engaged and highly motivated work force	-Provide nurturing and internship opportunities to outstanding students in ICT - Provide opportunities for continuing professional development	Development and establishment of the Internship, Incubation and innovation facility and ICT testing Centre for professional Certification.	- Increased ICT research - Emergency of appropriate ICT solutions in the sense of the developing world. -Student satisfaction. - Graduate satisfaction - Graduate training employment. - Employee satisfaction. - Skilful ICT human resource - Competent graduates -increased numbers of skilled and specialised professionals.										**1,500,000,000**
To support the university in establishing and implementing E-governance platforms.		Design, develop and implement a Procurement management information system.	Improved value for money - Quality improvement for services and supplies - Procurement Cycle Time - improved return on investment - Contract compliance improvements -improved level of institutional and personal integrity										**3,000,000,000**
		Develop and deploy Business intelligence systems and	- Improved governance -Accurate statistical figures										**1,500,000,000**

		infrastructure	-High business flow process integrity and transparency -Improved accountability for roles and responsibilities											
		Implementation of smart campus solution and IMIS framework	- Smart access of university facilities. - ICT-secured university access to -- - ICT resources and facilities											**3,000,000,000**
To build an engaged and highly motivated work force	Provide opportunities for continuing professional development	Capacity building of DICTS ICT staff.	- Innovation output. - Low ICT staff turn over - Profound work ethics for ICT staff.											**1,500,000,000**