



**TANZANIA COMMISSION FOR SCIENCE
AND TECHNOLOGY (COSTECH)**

**INFORMATION AND
COMMUNICATION
TECHNOLOGY (ICT)
POLICY**

February 2019



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THE UNITED REPUBLIC OF TANZANIA

Applicable Public Institution
**TANZANA COMMISSION
 FOR SCIENCE AND
 TECHNOLOGY (COSTECH)**

Document Title
 ICT Policy

Document Number

APPROVAL	Name	Job Title/ Role	Signature	Date
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Abbreviations

- ICT – Information and Communication Technology
- RTO – Recovery Time Objective
- RPO – Recovery Point Objective
- COSTECH – Tanzania Commission for Science and Technology
- COBIT – Control Objective for Information and related Technology
- STI – Science, Technology and Innovation
- HLI – Higher Learning Institution
- R&D – Research and Development

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1. INTRODUCTION

1.1. Background

The Tanzania Commission for Science and Technology (COSTECH) is a parastatal organization with the responsibility of co-ordinating and promoting research and technology development activities in the country. It is the chief advisor to the Government on all matters pertaining to science, technology and innovation and their application to the socio-economic development of the country.

Established by Act of Parliament No. 7 of 1986 as a successor to the Tanzania National Scientific Research Council, COSTECH became operational in 1988. The Act provides for a structural framework of the Commission, which brings together, the top leadership of the scientific and technological institutions in the country under one forum. Thus the Commission maintains a system of collaborations, consultations and cooperation with local and international parties whose functions relate to the development and application of science, technology and innovation. In that view, all local institutions that are involved in research and development are affiliated to COSTECH.

One of the key technologies, which the commission successfully promoted, is Information Communications Technologies (ICTs) in various sectors such as higher education, mapping, and health. The commission has been at the forefront in embracing ICTs, promoting them and extending support to other institutions in ways that comply with the National ICT framework (National ICT Policy 2016 and associated strategy).

1.2. Mission and Vision

Mission

To foster knowledge-based economy through promotion, coordination of research, technology development and innovation for sustainable development in Tanzania

Vision

A prime driver of science, technology and innovation for sustainable development

1.3. Mandates, Roles & Functions

Section 5 (1) of the Act of Parliament No. 7 of 1986 that established COSTECH stipulates the mandate of the Commission as being the principal advisory organ of the Government on all matters relating to scientific research and technology development in the country.

Arising thereto the roles of the Commission are as summarized below:

- i. To prepare and review national science, technology and innovation programmes, including dissemination and transfer of technology
- ii. To monitor and co-ordinate the activities relating to scientific research, technology development and innovation of all persons or body concerned with such activities
- iii. To acquire, store and disseminate scientific and technology information, and may, for that purpose hold or sponsor conferences, symposia, meetings seminars or workshops, or publish any news-papers, journal or periodical reposts or do any other act or thing designed to promote interest in science, technology and innovation
- iv. To register scientific research institutions operating in the United Republic of Tanzania and
- v. To advise the Government on matters such as: priority areas for scientific research; the allocation and utilization of research and innovation funds according to priorities scientific research and regional and international co-operation in scientific research, innovation and technology development and transfer; matters relating to the training and recruitment of research personnel

1.4. ICT Services at COSTECH

Through the Directorate, which is responsible for ICT, COSTECH, offers a number of ICT services to internal and external stakeholders. Internal services are those geared to support business processes of the COSTECH. They include mailing; Website, Research funding management; Research clearance management; resources management (e.g. finance and Human resources); centralized storage; Internet; Ethernet; digital library; integrated document repository; e-library; conference support; video conference; Voice over IP; Printing and scanning; access control; Local Area Network; and a number of other emerging services.

Although some of the above ICT services are used to serve external stakeholders as beneficiaries of COSTECH business services, there are services that aim to support research at affiliated institutions. Currently, there are Higher Education and Research Institution Network (HERIN) and Mobile Math. HERIN is a Government programme, which provides connectivity to private and public Academic and Research Institutions in the country. Mobile Math is a research programme, which introduced the easiest way of learning mathematics through mobile phones.

The ICT services for external use are mostly connectivity and access to content and are limited in a number of ways as follows:

- (i) Connectivity service through HERIN does not cover last mile. However, there are a number of private institutions, such as TERNET, which can provide support of some kind.
- (ii) ICT services that COSTECH offer are through partnership programmes and not entirely run by COSTECH due to financial constraints
- (iii) Services such as hosting have been provided under case by case basis after considering the severity of the need and availability of resources.

1.5. SWOC Analysis

1.5.1. Strength

- i. Top management's commitment to using ICT to support the business operations of the Commission.
- ii. The presence of a large proportion of average to advanced ICT users.
- iii. The existence of the long term Business Strategic Plan of the Commission that acknowledges the contribution of ICT.
- iv. COSTECH is an established brand as an ICT hub in the country.
- v. Proven record to attract investment from local and international partners.
- vi. Presence of national backbone infrastructures and Higher Education and Research Institutions Network.
- vii. Good work relationship with academic and research institutions.
- viii. Easy access to training opportunities.

1.5.2. Weakness

- i. Shortage of well qualified ICT staff.
- ii. Lack of ICT strategic and operational plans.
- iii. Lack of a well-established ICT department.
- iv. Lack of a clearly established ICT Governance structure.
- v. Ageing ICT equipment.
- vi. Low level of ICT and cyber security awareness.
- vii. Lack of a functioning disaster recovery plan.
- viii. Lack of a succession plan.

1.5.3. Opportunities

- i. The increased demand for ICT services among stakeholders.
- ii. Advancement or evolution of state-of-art technological solutions that can support the mission critical business of the Commission
- iii. The growth of the ICT sector and access to local and global expertise.
- iv. The existence of unexploited areas for application of ICT among stakeholders.
- v. A national ICT Framework (policy and guidelines) that aligns ICT with national development agenda.

1.5.4. Challenges

- i. High cost of bandwidth. Local Higher Learning Institutions (HLIs) and R&D institutions are not affording their demand for bandwidth.
- ii. Lack of national standards and well established regulatory framework for ICT implementation activities.
- iii. Existence of competition from ISPs in providing internet services to HLIs and R&D institutions.
- iv. Low number of highly qualified ICT researchers in the country.
- v. Presence of malicious ICT users and other cyber threats.
- vi. Low technological absorption capacity at HLIs and R&D institutions.
- vii. Limited ICT skills in the labour market.
- viii. Limited digital literacy among the public.

1.6. Rationale

The trend towards a knowledge-based economy has emphasized the importance of ICT in development efforts in coordinating and promoting Science, Technology and Innovation development activities in the country. This shift requires a well-developed technology investment plan, intelligent deployment of resources and maintenance management. At national level, a National ICT Policy of 2016 and related implementation strategy, provide a comprehensive framework for guiding the development and growth of ICT to ensure optimal benefits to the nation and its citizen.

For COSTECH to realize the value out of ICT investment while contributing to the implementation of the National ICT policy and associate strategy, ICT must be deployed to improve efficiency and effectiveness in internal and external services delivery. This means that, a comprehensive framework established by ICT Policy to provide appropriate directives to harness ICT, is necessary for achievement of COSTECH's objectives. Establishment of ICT Policy is an important step towards ensuring that ICT will assist COSTECH to attain its objectives. The ICT Policy will ensure that the ICT infrastructure and capacity are utilized effectively and are in alignment with the COSTECH's strategic objectives, National ICT Policy, National e-Government Strategy and the e-Government Standards and Guidelines.

The COSTECH need to meet its objective of improving its services and increasing productivity by leveraging on new technologies. COSTECH has continued to invest in ICT to facilitate its internal business operations so as to attain its strategic goals. COSTECH operations are increasingly depending on ICT, making the Institution vulnerable to ICT related risks. In this regard, it is evident that, COSTECH needs to develop and operationalize comprehensive ICT Policy to direct ICT adoption and usage within the Institution.

As a public institution, COSTECH is required by the Government directives to develop and implement various policies including ICT policy. This is key for the protection and guidance of the institutions and its members by providing them with rules for acceptable use of ICT facilities. Apart from this law-bound need for ICT policy, it is very much in the Commission's interest to have the policy due to many reasons including:

- i. Manifestation of the impacts of ICT that requires guided use of the resources.
- ii. The convergence and changing role of ICT.
- iii. With time, the ICT investment will increase and without the policy to guide the decision, the risk on the core businesses of the Commission may increase.

1.7. Purpose

This document provides the highest-level ICT directives for COSTECH. The main purpose of this document is to ensure that COSTECH's ICT related investment, operations and maintenance processes and usage are well directed. The specific objectives of this policy are;

- i. To ensure ICT governance is an integral part of the institutional governance.
- ii. ICT services provisions are in line with COSTECH's business requirements based on existing Government standards and best practices.
- iii. All the Institution information resources and services are well secured using appropriate controls.
- iv. To ensure the members of the Institution use ICT facilities and services in an appropriate and responsible manner and to ensure that other persons do not misuse those ICT facilities and services.

1.8. Scope

This policy is applicable to all COSTECH staff and associates, all users of ICT equipment owned or leased by the Institution as well as all equipment connected to COSTECH's ICT infrastructure. The focus is to address key domains of the COBIT IT Governance Framework: planning and organization; Acquire and implement; Delivery and Support; Monitoring and Evaluation. This good practice framework was created by the international professional association for Information technology management and Governance.

2. ICT POLICY STATEMENTS

2.1. General Statement

COSTECH management shall ensure an optimal delivery of business value by aligning ICT strategies with those of business in order to achieve the organizational-wide objectives while considering the risk exposures.

2.2. ICT Governance

ICT Governance is an integral part of corporate governance and consists of the leadership, organisational structure and processes that ensure that the organisation's ICT sustains and extends the organisation's strategies and objectives.

COSTECH shall put the strategic and operational management of ICT within the principles of ICT Governance and within the context of COSTECH's strategic directions (that is ICT Governance). In fulfilling this policy statement which also entails the objective of the policy, COSTECH shall also do the following:

- (i) Establish a framework for ICT investment decisions, accountability, monitoring and evaluation.
- (ii) Ensure that there is a formal ICT governance process that is consistent across the enterprise and has strong accountability.

Under this policy statement, high-level guidelines are provided for ICT processes and organization; Responsibilities of ICT users; ICT resources management; ICT performance management; Conformance; ICT projects management; and Procurement of ICT equipment and Services; as follows.

2.2.1. ICT Processes and Organisation

- i. The COSTECH will set up an ICT governance model so as to have the right structure to manage ICT operations and a secure ICT environment that complies with Government standards.
- ii. There shall be an ICT Steering Committee (or equivalent) to determine prioritisation of ICT-enabled investment programmes in line with the Institution's business strategy and priorities, track status of ICT initiatives, resolve resource conflicts and monitor ICT services.
- iii. COSTECH shall ensure that ICT strategic plan is established and operationalized.
- iv. COSTECH shall ensure that ICT Risk Management Framework is established. And ICT risk assessment shall be conducted regularly.

- v. COSTECH shall ensure all critical ICT related business processes are properly documented.
- vi. COSTECH shall ensure that all STI related information flowing in and out are properly mapped and reflected in the implemented systems.

2.2.2. Responsibilities for ICT Users

- i. The COSTECH shall ensure that individuals and groups within the Institution understand and accept their responsibilities with respect to using ICTs.
- ii. COSTECH shall ensure that acceptable use guidelines are known and adhered to by staff and all other authorised users.

2.2.3. ICT Resources Management

- i. COSTECH shall define a set of guidelines for ICT security, which shall be approved by management, published and communicated to employees and all other authorised ICT users.

2.2.4. ICT Performance Management

- i. COSTECH shall ensure that ICT Services are clearly defined, understood by users, and their availability is ensured to the maximum standards.

2.2.5. Conformance

- i. COSTECH shall conform to Government ICT related standards and guidelines.
- ii. In a situation where COSTECH collaborates with international stakeholders, then COSTECH must adhere to relevant international ICT related standard and guidelines.
- iii. All employees and third parties have a personal obligation to comply with internal ICT policies, guidelines and procedures and must keep abreast of, and comply with, any changes. Failure to comply will result in legal or disciplinary actions.

2.2.6. ICT Projects Management

- i. COSTECH shall conform to the Government ICT projects management procedures or any other approved project management framework.
- ii. All employees and third parties must comply with all internal developed procedures for managing projects.
- iii. COSTECH shall monitor the key ICT projects undertaken and provide regular progress reports on risks identified and preventive/detective actions taken.
- iv. COSTECH shall ensure all software projects developed conform to a proper systems development life cycle.

2.2.7. Procurement of ICT Equipment and Services

- i. The COSTECH must implement necessary controls to ensure that all ICT procurements are done in line with requirements of Public Procurement Act (PPA) of 2011 and amendment regulations of 2016.
- ii. User Departments shall establish and submit, in writing, all ICT related requirements for equipment and services weather ad-hoc or planned, to ICT unit. ICT unit in collaboration with procurement unit shall ensure that all requirements for ICT procurements comply with Government ICT related Standards and Guidelines.
- iii. Procurement unit shall not procure any ICT System, Service, Equipment, Consumable or Accessory if the head of the ICT unit has not endorsed the request. The endorsement shall include the preparation of specification based on user department requirements and submit to Procurement unit.

2.3. ICT Infrastructure

ICT infrastructure is the backbone for supporting COSTECH business operations by enabling information exchange and providing secure access to different applications. This consists of all hardware devices such as network devices, servers, workstations, laptop, storage, back-up, operating facilities and supporting platforms like operating systems and databases.

The objective of managing ICT Infrastructure is to ensure that COSTECH's ICT infrastructure operations are optimized in order to deliver higher-level service quality and support business-relevant operations based on ICT planning and management best practices.

Here, four main areas are addressed which are infrastructure planning and design; data management and storage; ICT equipment, hosting and collocation; and maintenance and support.

2.3.1. Infrastructure Planning and Design

- i. The COSTECH shall ensure that ICT infrastructure architecture is in place and in line with the Institution's current and future requirements.

2.3.2. Data Management and Storage

- i. COSTECH shall ensure that all critical data is stored in a manner that facilitates back up and access.
- ii. COSTECH shall establish a clear backup procedure for the critical business data.
- iii. COSTECH shall conduct regular data backup for critical data including science technology and innovation.

- iv. COSTECH shall enforce at least three layers of security for each critical data storage.
- v. COSTECH shall develop procedures for effective and efficient data storage, retention and archiving to meet business objectives.

2.3.3. ICT Equipment, Hosting and Collocation

- i. COSTECH shall ensure that appropriate environment for hosting computing and storage equipment based on standards and best practices is established.
- ii. COSTECH shall ensure that all collocation agreements include cost sharing components whether in-kind or in cash unless directed otherwise by the director general.

2.3.4. Infrastructure Maintenance and Support

- i. COSTECH shall ensure that all ICT infrastructure components are maintained at a reasonable working condition and secure level.
- ii. COSTECH shall ensure that standard software list including the operating system to be installed into the Institution's ICT equipment is established.
- iii. Users shall not install unauthorised/pirated software/program into COSTECH's ICT infrastructure.

2.4. Applications

Applications are software designed for end-users to use in their daily operations to support the enterprise business processes.

The general objective of managing applications is to ensure that ICT applications that are in use or are to be acquired to address the business requirements of the organization provide reasonable return on investment. Specific objectives are:

- i. To ensure system acquisition follows proper procedures;
- ii. To establish controls for efficient acquisition and administration of applications;
- iii. To enhance accountability on the management and usage of ICT Applications.

Here, two areas are covered: Application acquisition and deployment; and maintenance and support.

2.4.1. Applications Acquisition and Deployment

- i. There shall be clear and understandable business and system requirements before any application is acquired.
- ii. All applications supplied shall be checked by the ICT Unit to verify if the technical requirements are met and approved.

- iii. ICT Unit shall establish appropriate software standards to facilitate acquisition/development.

2.4.2. Applications Maintenance and Support

- i. Administration and maintenance of applications shall be an on-going process that will last throughout the life cycle of the application.
- ii. Every application acquired by the Commission shall have relevant and up-to date documentation in place.
- iii. Installation of additional applications or overriding or replacing existing ones shall follow change management procedures.

2.5. ICT Service Management

ICT Service management deals with how ICT resources and core business practices altogether are delivered in such a way that the end user experiences the most desired results.

The objectives of ICT Service Management are:

- i. To improve internal and external stakeholders satisfaction.
- ii. To assist in defining meaningful metrics to measure service results and using the metrics to drive continuous service improvement.
- iii. To enable the monitoring and improvement of service quality through the effective application of processes.
- iv. To ensure compliance with all Government Standards and Guidelines relating to the ICT Service Management.

ICT service management involves service desk; service level agreements; third party services; requests, incidents and problems management; change management; service availability; service continuity; and capacity management.

2.5.1. ICT Service Desk

COSTECH shall operate an ICT service and support function, which will ensure that business disruptions are minimised, users' queries are responded to timely and ICT problems are resolved.

2.5.2. Management of Service Level Agreements

- i. COSTECH shall ensure that for every ICT services provided, Service Level Agreements between the providers and the recipients are established.
- ii. COSTECH shall ensure that reports on service quality are reviewed periodically in order to improve service delivery and support.

2.5.3. Management of Third Party Services

- i. COSTECH shall ensure proper processes and procedures for managing vendors are in place.
- ii. COSTECH shall ensure that services procured from third parties (suppliers, vendors and partners) meet business requirements.
- iii. COSTECH shall ensure that it builds good relationships with the business and third party providers to ensure that ICT services delivered continue to meet evolving Commission's business needs.

2.5.4. ICT Service Requests, Incidents and Problems Management

- i. COSTECH shall set up a single point of contact i.e. service desk for end users where requests will be recorded, escalated to the correct group, resolved and closed to ensure restoration of normal service operations as quickly as possible.
- ii. COSTECH shall ensure that Service Requests and Incidents Management processes and procedures are established to ensure minimal adverse impacts on customers.
- iii. COSTECH shall review all reports about problems that resulted to systems downtime in order to identify root causes of problems.

2.5.5. Change Management

- i. The COSTECH shall ensure that a process for recording, assessing and authorizing all changes prior to implementation, including change procedures and processes, is established.

2.5.6. ICT Service Availability and Utilization

- i. COSTECH shall periodically record and maintain service availability reports and ensure that services are available, when needed.
- ii. COSTECH shall develop a mechanism to encourage effective and efficient use of services by external beneficiaries. ICT Students shall particularly be encouraged to use HERIN for research purposes including ICT security.

2.5.7. ICT Service Continuity

- i. COSTECH shall conduct a Business Impact Analysis to identify critical Business functions affected by downtime of ICT services/solutions in order to ascertain the recovery point objective (RPO) and recovery time objectives (RTO)
- ii. COSTECH shall ensure that a robust ICT services continuity and recovery plans are in place and that these plans are regularly reviewed and tested and key staff are appropriately trained.

- iii. COSTECH shall ensure that there is a reliable supply of power and power backup to critical systems.

2.5.8. Capacity Management

- i. Training and retraining shall be implemented to keep the ICT personnel abreast with the current trend of technologies.
- ii. The Commission shall facilitate training and re-skilling to all ICT personnel particularly for professional development. Various costs including registration fees to various professional ICT bodies shall be borne by the Commission as per prevailing policies.

2.6. ICT Security

ICT Security covers all the processes by which computer-based equipment, information and services are protected from unintended or unauthorized access, change or destruction throughout an organization.

The general objective of managing ICT Security is to provide The COSTECH with information security mechanism to support the Institution to achieve its strategic goals based on best practices. The specific objectives are:

- i. Protection of the COSTECH's ICT resources from accidental or malicious act while preserving the open information sharing requirements of the Government; and
- ii. Making the COSTECH's stakeholders aware of their responsibilities with respect to ICT security.

2.6.1. ICT Security Management

- i. COSTECH shall ensure information systems are designed, acquired and implemented with effective ICT security controls to safeguard the integrity, confidentiality and continual availability throughout the entire life cycle.
- ii. All employees and authorized users of COSTECH systems and infrastructure shall be responsible for protecting the Commission's information and ICT resources.
- iii. COSTECH shall retain overall responsibility and ownership for all Commission's information and ICT assets.

2.6.2. Monitoring

- i. COSTECH shall establish ways to monitor use of its ICT facilities and premises.
- ii. COSTECH shall conduct regular user access reviews and audits of information systems and other ICT infrastructure
- iii. COSTECH shall establish, monitor and review ICT key performance indicators as derived from ICT objectives

3. IMPLEMENTATION, REVIEWS AND ENFORCEMENT

3.1. Implementation and Reviews

- 3.1.1. This document shall come into operation after it has been approved by the approval machinery, and then shall be considered mandatory for all COSTECH business operations.
- 3.1.2. The policies described below provide top-level issues for common understanding of adoption and usage at the organization based on Government standards and guidelines and where necessary detail procedures could be developed.
- 3.1.3. All employees and other authorised users of COSTECH shall comply with the requirements of this policy.
- 3.1.4. The head responsible for ICT shall enforce compliance by using audit trails and triggering access denial to COSTECH systems and networks.
- 3.1.5. COSTECH staff found to have violated this policy may be subject to withdrawal and or suspension of systems and network privileges or disciplinary action in accordance with rules defined by COSTECH administrative regulations.
- 3.1.6. This document shall be reviewed within three years, or whenever the business environment of COSTECH changes in a way that affects the current policy.

3.2. Exceptions

- 3.2.1. In case of any exceptions to this policy, it shall be thoroughly documented and follow through a proper channel of authorization using the same authority which approved this document.

3.3. Roles and Responsibilities

3.3.1. COSTECH Management Team

- i. Review the ICT policy and recommend to the committees of the board for endorsement and subsequent approval.
- ii. Provide strategic directives on utilisation of ICT in order to enhance productivity by ensuring effective and efficient systems;
- iii. Appoint an ICT Steering Committee and determine its terms of reference;
- iv. Ensure implementation of the ICT Policy.

3.3.2. COSTECH Board of Commissioners

- i. Shall direct, set or approve the ICT policy and its implementation programme including ICT steering committee.
- ii. Shall approve ICT investment of substantial amounts.

3.3.3. ICT Steering Committee

- i. Shall propose changes to the policy for the consideration by the Management;
- ii. Shall ensure that the ICT Strategy is aligned with COSTECH's Corporate Plan;
- iii. Shall advise the Management team in making considered decisions about the focus of ICT resources;
- iv. Shall review all ICT services and applications including infrastructure with the view to advise COSTECH on required improvements; and
- v. Shall ensure that risks associated with ICT are managed appropriately.

3.3.4. COSTECH Directors/ Managers/Head of Sections/Units

- i. Shall ensure that all users under their supervision are aware and comply with this policy;
- ii. Shall provide adequate and appropriate protection of ICT assets and resources under their control;
- iii. Shall ensure availability, integrity and confidentiality of information produced by systems under their areas of functional responsibilities and thereby ensure continuity of operations; and
- iv. Shall review and approve procedures, standards, policies and guidelines developed from this policy for the purpose of maintaining business continuity and security of COSTECH's ICT resources.
- v. Shall be the custodian of "Data and Information" for their respective Departments/sections/Units.

3.3.5. Head of ICT Unit

Subject to general oversight of Management team and advice of the ICT Steering Committee, the Head responsible for ICT shall oversee the overall implementation of this policy and reports directly to the director general; and in particular he/she shall;

- i. Coordinate the review and amendment of this policy, as and when required in order to accommodate new technologies or services, applications, procedures and perceived dangers;
- ii. Plan and develop ICT Strategy and The COSTECH's Enterprise Architecture and ensure its implementation.
- iii. Monitor adherence to the ICT Policy and the presence of

- potential threats and risks by ensuring periodic ICT security reviews are conducted
- iv. Keep abreast of ICT developments in respect of ICT industry in General and COSTECH's systems in particular.
 - v. Initiate and recommend proposals to change, modify or improve this policy; and
 - vi. Recommend procedures, standards and policies for effective implementation of this policy in line with Government Standards and Guidelines.
 - vii. Be the custodian of all ICT resources of COSTECH.

3.3.6. Users of ICT Systems

- i. Shall be responsible to safeguard ICT assets of COSTECH in their custody.
- ii. Shall comply with this policy.

3.3.7. Monitoring and Evaluation

- i. ICT Steering Committee shall meet at least quarterly to monitor and evaluate the achievements in ICT initiatives against ICT Policy, Strategic Plan and Enterprise Architecture.

3.4. The composition of the ICT Steering Committee (or equivalent)

- i. The director general of COSTECH shall be the chairperson of the committee unless advised otherwise by the board of commissioners.
- ii. Head of the ICT Unit shall become the secretary to the steering committee.
- iii. COSTECH management shall appoint six other members to the committee two of which from outside COSTECH.
- ii. There shall be a healthy mixture of professional among the six members including at least one outside ICT expertise.

COSTECH - ICT Policy