A Feasibility Study for the Implementation of an Education Management Information System (EMIS) and E-Library System for all Higher Education and Research Institutions in Tanzania

Deliverable No. 2:
Survey Report on the Existing IT Infrastructure, Related Environment and User and System Requirement for the EMIS and E-Library System
Conclusions and Recommendations

by
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Outline

• Introduction
• Conclusions
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Introduction (1)

• This study was meant to
  – Survey the existing infrastructure, related environment, user and system requirements
  – Compile technical specifications for the EMIS and E-Library system
  – Identify optimal solutions to best meet the long-term requirements at an individual institutional level and at national level for EMIS and e-Library systems for the HERIs in Tanzania in a cost-effective manner

• A number of conclusions and recommendations have been drawn from the analysis and the study findings presented earlier
Status of Infrastructure and Personnel in HERIs (1)

• Generally the infrastructure in most HERI in Tanzania is poorly developed
• A number of institutions use old and out of date equipment and technologies.
• Some institutions do not have libraries in the first place. A few available libraries in most HERIs are under-staffed and lack competent staff.
• In addition, most of existing libraries are poorly equipped with the required facilities such as furniture, size of labs, hardware and software etc.
• These findings show clearly that library facilities in the country’s HERIs is marginalized and therefore under-served largely because its functions and roles in supporting economic and social development in Tanzania is not known.
The use of EMIS in institutions varies according to the various components of a typical EMIS. The highest used components were:

- HR component: Payroll (28)
- Student records module: Enrolment (25)
- Asset management: Maintenance (6)
- Marks administration: Reports (20) and grades (20)
- Financial management: Accounts payable (29) and accounts receivable (29)
- Document management: Versioning (1), Metadata (1), Indexing (1), Searching and retrieval (1)
- E-learning/Learning management system: Collaborative tools (5)
- Research: Research niche areas (1), title and project registration (1), progress tracking (1), research repository (1)

The highest used component is used by only 29 out of 120 institutions (24.2%), showing a very low adoption rate of EMI systems amongst Tanzanian HERIs.
Status of Infrastructure and Personnel in HERIs (3)

- Many of the sampled HERIs do not have ICT staff, and for a few HERIs with ICT staff, a good number of them are incompetent thus relying on short time and academic staff who are not necessarily ICT literate or do not have adequate time in addition to their academic responsibilities.

- In some HERIs, especially HEIs, Lecturers and/or Instructors work as IT support service providers in areas such as Network Administrators, System Administrators, Web Master etc.
Recommendation 1:

- Besides ensuring that *appropriate choices are made about ICT infrastructure*, it is equally important to ensure that *sufficient attention is given to institutional capacity building* as well as *capacity development*.
  - Institutional building focuses on whether institutions have the appropriate systems, procedures and structures to carry out their functions and mandates, while, capacity development is concerned with the professional and continual development of those working in the field of EMIS and related activities.

Recommendation 2:

- The implementation of a standardised country-wide EMIS for the high number of Institutions without a formal EMIS should be considered as it would enable better management, reporting, decision-making and policy formulation.
Status of Infrastructure and Personnel in HERIs (5)

Recommendation 3:
• There is also an urgent need to change the mind-set of the public by scaling up the awareness and sensitization programmes, as well as formal training programmes. Such initiatives will serve two purposes, namely
  – to understand the significance and contribution of the library sector in the economy and therefore the livelihood of the people, and
  – develop a culture to make use of library services

Recommendation 4:
• It is further recommended to use free and open source software (FOSS) where possible for the EMIS and library services, rather than proprietary
  – The software should be well-established and proven open software which can easily be customized according to the needs of the various HERIs.
  – It should also be able to integrate with other software or existing systems to facilitate of information sharing

Recommendation 5:
• HERIs need to acquire adequate ICT human resources and thus separate academic from ICT staff, since the dual responsibility are not conducive to either of the two fields of responsibility.
Budgeting and Budget Allocation (1)

• The findings indicate that out of every 10 HERIs, 6 have budget lines (budget allocation) for ICT and EMIS. This is a notable progress towards adoption of ICT and EMIS in HERIs.

• However, shortage of financial resources is one of the critical factors undermining the adoption of EMIS and E-Library systems in Tanzania. In most HERIs there is a huge gap between resource requirements and available resources. In addition, the small budgets which are availed to the HERIs have not been allocated strategically and utilization is occasionally sub-optimal. This situation is mainly due lack of knowledge and awareness by the top management or decision makers in HERIs.
Budgeting and Budget Allocation (2)

- Management teams in HERIs have not fully acknowledged the importance of EMIS and especially ICT and have therefore not been paying any attention towards adopting and expanding ICT in their respective HERIs

**Recommendation 6:**
- To improve such a situation, we need to create awareness and sensitize practitioners or make it mandatory for all HERIs to properly budget for their ICT needs. There should also be tailor made training programmes to create awareness of the management teams of the respective HERIs
Budget Adequacy (1)

- The findings show that out of 71 institutions which have budget allocation for ICT and EMIS, only 3 (4.2 percent) admit that the allocations were sufficient.
- This situation is disconcerting in a world that is becoming increasingly digital. According to the literature and best practices successful higher education and research institutions adequately provide for their ICT needs.

Recommendation 7:
- It is therefore recommended that the ICT operation and related activities should have a separate budget line. In addition the ICT budget should be given high priority and should at least be equivalent to 5 to 10 percent of the total budget allocated to the institutions.
ICT Policy (1)

64% of HERIs in Tanzania operate without an ICT policy, which is very disquieting. Most of the HERIs operating without ICT policy are public and higher learning institutions. Policy is a purposive course of action which is meant to achieve certain set targets and objectives and to govern the operations and/or activities of an organization. Since most of the HERIs lack an ICT Policy, implementation of systems is not done in a systematic way.

Recommendation 8:

A fully developed ICT Policy and Strategic Information Systems Plan (SISP) is needed for each HERI to successfully achieve the full benefits from ICT in the digital era if such organizations are to achieve their targets and goals. It is therefore recommended that ICT Policy at the institutional level should be made mandatory to enable HERIs plan and evaluate the implementation of their ICT activities.
90% of HERIs have indicated that they have no plans to automate their libraries in the near future. These HERIs have indicated plans to automate their libraries and establish electronic access of their publications. However, given the limited budgets (under-funding) the chance is small that these libraries will be automated in the near future. The implementation of their plans will therefore be affected by lack of adequate funding.

**Recommendation 9:**
- It is recommended that the Government in collaboration with other key stakeholders need to come up with an effective resource mobilization strategy which will enable the government to create a funding facility for the HERIs in Tanzania.

**Recommendation 10:**
- The digitisation of libraries and the implementation of a standardised library management system is highly recommended to enable the sharing of important resources by HERIs. A unified and centralised approach to the subscription of electronic resources will bring important economies of scale.
Most respondents strongly emphasised the need for an EMIS due to the benefits to institutions. EMIS is necessary to enhance academic activities, facilitate teaching and learning, and share research and information.

EMIS will also provide the necessary information that needs to be reported to government and other relevant agencies. Unfortunately the adoption of formalised EMI systems by HERIs in Tanzania are relatively low and currently hampers the effective and timely planning and decision-making by stakeholders and government.

Many pre-conditions for the implementation of an EMIS were also mentioned by respondents, for example, the necessary ICT infrastructure (network, data servers, routers, generator, internet, e-mail, printers, and computers) and connectivity (broadband, improved bandwidth, last mile connectivity to the national backbone, connectivity to other institutions, linking of schools to main campus need improvement to meet the demand) and the need for more ICT staff.

The conditions are currently the factors limiting the wide adoption of EMIS.
Recommendation 11:
• It is strongly recommended that given their benefits in the education sector, science and technology, as well as the overall social economic development, the Government in collaboration with other key stakeholders should ensure that a standardised EMIS that can easily integrate with existing systems are rolled out throughout the HERIs.

Recommendation 12:
• The necessary ICT infrastructure, Internet connectivity and ICT support staff should be ensured to enable the implementation of an EMIS.

Recommendation 13:
• There is also an urgent need to design training programmes which will subsequently be used to train the staff on ICT, as well as capacity building.
Data Collection and Analysis to inform policy and planning (1)

- A fundamental tool of educational policy and planning is robust data collection and analysis. Progress and results cannot be measured unless there is a sound statistical base. An EMIS is thus more than just collecting and storing data. Data should be analysed and used to inform policy and planning and should be readily available.

- Problems in HERIs easily arise with inappropriate software, when data is not regularly inputted and is therefore incomplete and when data is inaccessible to those who need it. From the interviews is also emanated that the various EMI systems are not always aligned to strategic plans, thus it is not able to be effectively used for measuring progress towards outcomes and goals.

Recommendation 14:

- It is recommended that EMIS should not just be used to collect and store information; otherwise there is a risk of collecting statistics for the mere sake of collection. EMIS should be adopted in all the HERIs for data collection, analysis and afterwards inform the policy process and planning in the country. This can only succeed when the system is integrated nation-wide.
Connectivity: Operationalization of the National Backbone (1)

- The importance of broadband Internet to economic growth and sharing of knowledge has been adequately proven in the literature. Any country that takes Research and Higher Education seriously, are currently investing heavily to create a broadband infrastructure and to connect HERIs to it. However, most of the visited HERIs in Tanzania have not been able to connect to the National Backbone for various reasons.

- The most important of these reasons is the fact that the cost of connection is not affordable by most institutions. In addition, some institutions claim that they are located very far from the point of connection.

Recommendation 15:
- It is therefore recommended that all HERIs should be connected to the national optic fibre network. The cost for connectivity should be reduced substantially to enable more HERIs to connect to the National Backbone and thereby improve the speed and quality of accessing information.
Connectivity: Operationalization of the National Backbone (2)

**Recommendation 16:**

- There is a need for more bandwidth in some of the institutions such as Bugando Medical Centre, so as to facilitate the telepathology, telemedicine, teleoncology etc. Due to the nature of knowledge work, Tanzania need to follow the worldwide bandwidth norm for HERIs of at least 10Gb

**Recommendation 17:**

- Due to the variety of ISPs used, as well as the varying bandwidth and quality, it is recommended that a single ISP for all HERIs is used.
THANK YOU

END OF PART THREE