

DEVELOPMENT STRATEGY OF A TECHNOLOGICAL UNIVERSITY LIBRARY
MANAGEMENT INFORMATION SYSTEM (MIS):
A CASE OF MOI UNIVERSITY, KENYA.

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This paper contemplates the Library Management System (MIS) as utility for processing, accessing and retrieving information to support scholarship and decision-making process. It contents that without an organised approach to the Management of Information, in the context of information exploitation scenario, organisations would suffer from information accessibility and retrieval while the clientele may actually find it equally hard to access and make decisions based on the right packaged information. The library MIS is thus considered a utility in the management of knowledge for access and exploitation. It is therefore argued that the library MIS would provide the means and method to manage multimedia-computer based Information Systems to help gain useful, complete and timely information through its objective of satisfying scholarly, academic and administrative information needs of the University. Given that Moi University is multi-campus based, boosting of scholarly, academic and administrative clientele that is objective, analytical and information oriented, with the need for the library operational efficiency and organisational effectiveness, it thus calls for the library MIS integrated Multimedia approach to revolutionise its information provision sector. Since the perception of the library MIS objective is measured through its utility for the creation, process, storage, and retrieval of information and given that such MIS supports the library information management process by efficiently processing knowledge and effectively supplying useful information, it directs this paper to postulate the library MIS strategy as well placed and advantageous for accessing, retrieving and sharing information in technologically oriented University environment.

INTRODUCTION

Moi university library has a computerized Management Information System. Being an essential service support department, it provides students, faculty members and staff with information resources for teaching, extension and research. This is possible through its internal and external network setting, OPACs, CD-ROM distribution capability and internet connectivity. The Management Information System is essentially a federation of information that are designed to support the functional units of the organization. The focus of this paper is on the exploitation of Information and Communication Technology in accessing and sharing information resources. It takes into account organization information needs and systems requirements pertinent in implementation of a computer-based management information system whose sole purpose is capturing information from both internal and external sources basically to enrich the teaching and research activities of the University. Given Moi University computerized information system infrastructure and ICT global trends, there is a tremendous scope for greater and more effective use of information and communication technologies.

PROBLEM ANALYSIS

The University library exist to support the function of the University in terms of teaching and research. Particularly through its provision of adequate and relevant information resources that are supportive of faculty program needs. It is clear that the provision of up-to-date hard cover material and publications is limiting to which access to and downloading of information from computerized systems remain crucial factor. This makes the University library role crucial in ensuring that the information materials are readily accessible with ease of sharing. The library computerized MIS is challenged to meet a criteria of enabling access and sharing of information resources, enhancing communication processes within and without and achieve a distributed CD-ROM databases for central link-up across campuses, colleges and Universities.

The library has a clientele that is scattered across 5 campuses far away and nearer by. But the computer infrastructure within the university has grown in isolation meeting the needs of individual faculty and departmental users. The need for the library MIS integration might be felt frustrated unless there is a link possibility. The pertinent issue being addressed is the frustrations users go through in order to find and retrieve the information material they so much desire from within and without the system and the University at large. The library is as such faced with various challenges of streamlining its in house operations to easily adopt to computerized MIS and ensure it has a kind of MIS that is technically sound and end-user friendly. Some of the library process are not automated. Linking the library MIS to the other existing systems that have different software tend to pose integration technicalities. The library will need to redefine its vision, mission and objective in order to fit into the University corporate MIS policy for it to remain a visual center of all around information activities. Its network strategy is to aim to provide many or all its users with personal work stations and connect them to a network structure enabling users access to each other and every information system on the network.

The concept of strategic planning and self-renewing in terms of the university library MIS is quite inherent in the British Atkinson committee (1976). What the committee acknowledged as the role of the library in British Universities, is equally true to British Universities as it is today to Moi University. The library need to take its direction within this context, perfect its mission by putting in place a modern information technology system for purposes of accessing and sharing information resources. Subsequently, strive to build a firm vision of a library service that is not only appreciated but also highly valued, respected and depended upon by faculties and end-users within Moi University and beyond.

MODELS AND FRAMEWORK

The guiding hypothesis of this paper underscores the library computer MIS, through network connectivity, as being necessary for ease of access and information sharing, thus increasing service responsiveness to remote users and therefore does contribute to the attainment of the University strategy. To achieve this purpose, there has to be a network

in place as a strategy to provide many or all users with personal work stations and connecting them to a network infrastructure so that each one has easy access to each other and every system. Thus the making of greater use of information resources via access requires new ICT approach in a well articulated management information system (MIS) environment. The simple purpose for such a library MIS would facilitate access and sharing of information resources in the university. They actually combine to enhance the university teaching and research activities.

An ideal university library MIS documented models and framework are not readily available. But there is need for guidance on efficient and effective flow and accessing information resources in a multi-campus setting like Moi University. On the other hand, a search for an ICT model that will provide for integration and accessibility of information remotely besides availing a relevant and suitable platform for the required format by image, graphics, sound, voice and videotext. This kind of platform is reflected in multi-media computer setting. Yet it is imperative to reflect also on the very current information communication and technology application for those that are multi-media based for adoption. Multi-media need to be described Shibanda (2002) in the light of images, graphics, sound voice, video text and tabular information within a human information interfacing that uses capabilities to access and present information. Within such technology an enabling interface through GroupWare, speech generation, graphical user, interfaces and convergence of telephone and cable television provide for the conferencing and other interactive mechanism which can improve inter and intra organization communications because it allows the end-user to share, communicate and process a variety of forms of information in an integrated manner.

A framework on computers, management of data and information can be visualized through Hutchinson and Sawyer (1994) description of electronic communication technologies namely; transmission media, communication hardware, communication software, communication networks and communication services and utilities such as E-mail, electronic bulletin board, voice mail, public database and information services. Speed is a factor in this architecture since it involves data transmission and therefore choosing the type of channels used. This suggests for efficient data transmission including coaxial cable, fiber-optic cable, microwave circuits and satellite systems for transmission of large volumes of data at high speed.

For that matter, according to Shibanda (2002), in sharing resources, communication networks are most useful. A network entails collection of data communications hardware, computers, communication software usually connected in a pattern to allow sharing of information and equipment. Private category of networks are suitable for universities. They are actually models for individual institutions with geographically separated facilities and requiring large volumes of data and voice communication. In this case network configuration are ideal for local area networking (LAN), wireless local area networks (WLAN) wide area networks (WAN) and metropolitan area network (MAN). Types of network configuration exist in the name of Star network, Bus network and Ring network. The essentials of communication services, systems and utilities constitute a connection of a PC, modem, telephone and data communication software which is a

recipe for hooking into a network that provides for researching and accessing information via a database, conferencing with several experts and mails communication. Essentially they are good for accessing and exchanging of information between computers in remote areas given within buildings, offices in different sites, geographically or within one building, one site or location. Academic / Public network provides resources of database, teleconferencing and information services like electronic Bulletin Board services.

Electronic mail which facilitate exchange of memos and making announcement and meetings. Miller, Baber and Gilliland (1993) view World Wide Web (WWW) as revolutionizing communication globally in the category of multi-media format, and therefore suitable model for developing a wide range of multi-media application and services. Web sites prototype include:

- network based multi-media information services system concepts.
- Multi-media local area distribution system
- User interface for browsing, search, notification and retrieval
- Creation of electronic document
- Communication and issues involved in publishing

Subsequently, a framework for information system model may take the following approach consisting of five components in the their sequence:

- (i) Information System Strategic Planning (ii) Information Systems Development Planning
- (iii) Application Selection (iv) Database Development (v) Implementation

Accordingly, a framework for developing information systems can be borrowed from the multiview methodology, Bhatnagar (1990) that emphasize:

1. Analyze Human activity system
2. Analyze information
3. Analyze and design social-technical aspects
4. Design human computer interface
5. Design technical solution

Multiview methodology emphasize social aspects (how it affects me), role set (will my job change), people tasks (what will I have to do), human-computer interface (what input and output are there?), application (what will it do?), information retrieval (what information will I get?), Database (what data are involved?), Data maintenance (how do I maintain the system), control (what errors are detected?), recovery (what happens when it goes wrong?), monitoring (is the system performing as specified?), will it affect anything else in the computer solution?)

Generally what is evident at stage:

1. Is the social-cultural context in which any information system must survive is studied and brought into perspective

2. Is the process of information analysis occurring. Is this process the main functions for the information system are abstracted and linked to the things or entities which we need to hold information about
3. Encourages users and system designers to interact. The participation in the design process encourage an optimal or acceptable fit between the social objective and the technical objective.
4. Deals with the ergonomics of the computer solution. The problem which technical options impose on the human participants can be considered.
5. The imposition of a technical solution occurs within the bounds set out by all previous stages.

LIBRARY COMPUTER MIS JUSTIFICATION STRATEGY

There has to be a justification for the need to establish library computerized MIS in the university setting. Particularly, given the fact that there is a common information infrastructure for networking. Such justification borders on seven levels of library computerized MIS needs criteria on:

- Easier access and sharing of information resources
- Improved efficiency and increased productivity
- Enhancement of communication processes
- The principal of distributed CD-ROM databases.
- Creation and management of in house database
- The need to strengthen the organizational structure in the development, use, operations and maintenance of information systems and information resources.
- Better public relations

ENVIRONMENTAL ANALYSIS

It might be of interest to note that Moi University is its only kind to have been conceived, initiated, planned, built and developed by Kenyans as a Science and Technology oriented. This was as a result of 1981 Presidential working party, chaired by Professor Mackay, recommendation to establish a second University in Kenya. Thus Moi University through its Act commenced in 1984.

The University current student population is 5500 with about 4000 faculty and administrative staff. The students are spread across the following faculty programs; faculty of education, faculty of science, faculty of technology, faculty of health sciences, faculty of Information sciences, Institute of Public Health, School of Environmental Studies, Faculty of Forestry Resources and Wildlife Management, School of Graduate studies, Faculty of Law, School of Business Studies and School of Social Cultural and Development Studies.

Moi University is spread out in four locations comprising of Chepkoilel campus, two Town campuses with annexes, Western Constituent College and the main Kesese

campus. Through its community based outreach activities, Moi University has research sites at Sabaki Malindi, Homa Hills in Rachuonyo, Gwasi East Suba, Lomolok Marigat, Kampi Ya Samaki Lake Baringo and Ziwa Station. The University is therefore multi campus based having strong association with other universities nationally and globally. Moi University international linkages include:

- Amsterdam University, Holland on environmental studies and central administration.
- Technical University of Delft joint program with the faculty of Technology
- University of Hamburg, Reading University, University of Wales UK, University of Maarstricht,
- Wegeningen University-Holland, French School of Paper and Industry, Indiana University
- South East University of China, Linkoping University Sweden.

This set up reveals a number of issues relating to information needs and more so it avails an organization configuration befitting a management information system and endowed for computer based library MIS.

Moi University operates within focused corporate statements that envisage its vision, mission, dedication and objective.

VISION

To be recognized nationally and internationally as one of the finest universities of science, technology and development.

MISSION

To pursue excellence in teaching, research and scholarship and produce well informed, practical and holistic graduates who are capable of:

- Functioning and contributing effectively to development efforts in rural based situations.
- Offering expertise in areas of national development
- Applying the principles of science, technology and culture in the national development agenda
- Being responsive to the needs and well being of others.

DEDICATION

Community-oriented teaching, research and public service, provision of quality training of students and generation and sustenance of a conducive environment for staff.

OBJECTIVE

Shibanda (1994) work on collection development as performance measurement summarized the objective of Moi university as to preserve, produce, transmit and disseminate knowledge and stimulate the intellectual life and cultural development of Kenya, to develop and transmit knowledge and skills through the medium of connected colleges, schools, institutes; to provide university education aimed at producing mature and conscientious graduates with skills, ability and desire to contribute to the wellbeing and development of the people of Kenya and to provide University education for national service and development which reflects the national cultural heritage.

INFORMATION POLICY

This simply means an organizational common vision of the future role of the information and information system. The purpose for the University Information Policy is to issue clear guidelines and strategies for managing information. More so, provide an understanding of what constitute information and how it should be utilized and managed is imperative for the University in the present era of ICT. This is pretty necessary if the University has to attain its vision, mission and objective. It is argued therefore that an information policy is necessary for any management information system MIS plan and implementation. The major MIS resource management functions include library management, academic affairs management, financial management, human resource management and assets/facility management. Moi University information policy potent a philosophical approach of studying information and its impact on the institutional and end-user needs, including individuals and the society at large. Its utilities can be evaluated against the background of information and knowledge creation, processing storage for access, retrieval and utilization. The University corporate management information system include Academic Register (ARIS), Information Resource Center (IRM), Library Management Information System among others. The corporate University MIS aims to support the institution management process generally but particularly the activities of employees, management of the university, end-users by efficiently processing data and effectively supplying information at all levels of utilization.

What is evident is the fact that Moi University has a management that support management information system for its own strategic competitive advantage. The University has strategically placed IRM to ensure it plays a central role in the MIS development. Its main functions include technology management, data management, distribution, operational management, strategic management and end-user management. By putting this policy in place signals that Moi University recognizes the fact that Information Technology would help sway performance for the institution including ensuring access and transfer of knowledge and information.

UNIVERSITY TRENDS

There are three periods of developments characterizing Kenya's public Universities.

(a) 1956-1984: This period is associated with planned and controlled expansion of a single university

institution.

(b) 1985-1990: This is described in the light of the changes for the University system, increase in the

number of public universities and students enrolment.

(c) 1991-Todate: This period shows the improvement of the quality of teaching and research among

other a few issues.

This situation has called for a proper restructuring, management and staffing of public Universities in addition to funding and sustaining of the overall rate of university expansion and ensuring a balance of different courses. Singled out as critical issues is the management of public universities within the education sector are:

- Increased access to education
- Equity in education
- Education quality

In this case, establishment of MIS is one crucial action for the universities to be able to meet their objectives. Particularly strengthening information systems at the Kenyan public Universities. Consequently, this calls for reengineering the university library management information systems and empowering them technologically as tools for global information access and delivery.

THE UNIVERSITY LIBRARY

The University library is one of the essential service support department of Moi university. It currently has a computerized library MIS. Its electronic information resources include the library OPACs operating on Tinlib integrated library system. This has provided for the catalogue and circulation modules. In addition, there are CD-ROM and Procite abstracts database. There is internet connectivity allowing web sites browsing and E-mail facilitated communication. There is the inhouse Star bus network topology providing for intranet connectivity for users outside the main library. The main library has 35 PCs being served by two file servers running on SFT version of Novel in a network environment. Six of the PCs have CD-ROM drives. The branch libraries have several PCs with CD-ROMS drives. They enjoy internet connectivity and connect through the main library system via intranet.

Accordingly, the University library need to readdress its significance within the University as summed in the Atkinson Report of the British University Grants Committee of 1976, that remains valid as of the role of a university library today, stating:

- "The library is the core of the University. As a resource it occupies the central and primary place, because it serves all the functions of a university teaching and research, the creation of knowledge and the transmission to posterity of the learning and culture of the present and the past"

The place of the university library services should be seen within the concept of Moi University corporate statements of vision, mission and objectives. Thus the primary vision of Moi University library is to provide a kind of service that will signify excellence in scholarship. Under this vision, the mission of the university library is therefore to meet the teaching and research needs of the university by developing a comprehensive but appropriate update collection of information and knowledge resources with ease of access. Such information resources comprising of both print and electronic media would be managed through expeditious application of a well endowed library MIS and by extension multi-media resource center.

Given the vision and mission of Moi University library, it thus indicate a proviso to the objective of the university library as:

- To improve and enhance the provision of adequate, relevant and update information resources in all
Format in order to facilitate quality education, teaching and research.
- To create a conducive learning environment in which the actual sharing of knowledge and information
is a prerequisite.
- To ensure the protection and security of the available resources.
- To enhance the recognition of the critical role that the library plays in the broader concept of academic empowerment bearing in mind the real growing needs of the university and the challenges of ICT and globalization.

In essence, the performance target for the outlined objectives should be acquiring and installing appropriate technology to enhance accessibility and sharing of information resources from within the library and beyond the university available in information database globally. Hence put in place a library MIS that eliminate all impediments to the access of information resources needed for teaching and research and thus:

- Improve information resource storage and retrieval through multi-media capabilities and
- Enhance document delivery
- Boost electronic based library information searching and delivery
- Enhance institutional links for resource sharing by accessing national, regional and international on-line databases

The significance of the university library is expressed elsewhere quoting Atkinson report. The library role will therefore remain core to the existence of the university as reinforced by Shibanda (1994):

- ***It should be noted that while a faculty in the university can be closed down for lack of students, funds, lecturers or otherwise, a library on the other hand cannot be closed, thanks to the central positions it enjoys within the university, partly because it is a measure of the university itself...without it the university will lack***

credibility... boiling down to one thing, that the existence of a library is highly essential and therefore calling to treat the library as one of the priority academic areas for support...

The university support to the library is therefore very necessary to ensure that the library continue to play its crucial role of supporting the university functions.

MIS SCOPE AND STRATEGY

So far there is an operational computerized information systems owned by different faculties and departments. They include the following:

- Office Computing; with various applications for office automation in the university.
- Internet Connectivity with E-mail
- Network infrastructure existing in certain departments/faculties (LAN in Library, Faculty of Technology Computer and Department of Civil and structural Engineering laboratories, Faculty of Information Sciences and WAN)
- Library Management Information System
- Information Resource Management (IRM)
- Academic Register Information System (ARIS)

Moi University information policy provides guidance to the requirements of a corporate MIS including the library. It is therefore considered that the library MIS is primarily intended to support institutional objectives. There is need to examine the component of the system specifically those outlined under a framework for information system model as befitting the library MIS.

- a. Information systems strategic planning
- b. Information systems development planning; which provides for translating the high-level information requirements identified in information systems strategic planning into requirements for the applications and databases needed to support the University core functions. Appropriate application packages and design, develop, databases are clearly defined. They are itemized in terms of priorities based on the needs of the university and the technology available to support those needs. The core functions established in information systems strategic planning is maintained while the emphasis is shifted to the data processing requirements necessary to implement the information system. What is critical to its success is to enhance the MIS infrastructure that will perfect the utilization of the library resources.
- c. Application Development which simply uses the application requirements and items defined in information systems, development planning in order to establish the specification for developing or acquiring the software necessary to put the application into place. Use of the application development results in tested programs / applications that are ready to be installed on the MIS delivery system comprising of hardware, system software, communication, etc. Since functions were used to establish the specifications needs or for the applications, the applications are fully supportive of the library MIS. This will ensure incompatibility problems are reduced.

- d. Database Development; that uses the information system development planning to produce the data base needed to support the library end-user needs. Basing information system on the data created and used by the library information services, is recognized as the key ingredients to improve the library MIS.
- e. Implementation; apparently involves the process of installing the computerized information systems. The steps involved are converting the existing systems, conducting user and operator training. Observation of the systems is continued and fine tuning the systems is done whenever necessary.

COMMUNICATIONS NETWORK

Communication network entails three aspect of network topology, network architecture and network management strategy.

NETWORK TOPOLOGY

There are a number of network topologies comprising the Linear Bus, the Star Bus and the Ring Bus. The choice of one over the other should be based on the strength and less weaknesses. For the purpose of Moi University library MIS there is a through search for the type that has is efficient. The library system experience has shown that the Linear Bus architecture cannot be effective. The linear bus consist of a central cable running around the entire length of the network premises. It is the cables that is referred to as the bus. All workstations are directly connected to the bus. The bus is terminated at eitherend with electrical resistors. What is found worthwhile in this topology is that it is cheaper and easier to install in comparison to all others. The biggest worry being a disadvantage is that should there be a break anywhere in network cabling, the wholenetwork crashes thus bringing everything to a hold. It is even difficult to locate such breaks in some large installation due to line breakage. Certainly, this topology is not suited to very large private (University) installations. In most cases, repeaters are to boost signals if the length of the bus exceed 185 meters. The university library has suffered setbacks inherent in this architecture.

The library option was then to avoid such a bus and adopt a Star Bus architecture that basically consist of the workstations and the file server being connected to a hub. A hub is actually an electric device which channels electric signals from both the file server and workstations to each other. The advantage of the Star Bus is that should a cable connecting a workstation to the hub break, then only that workstation would lose its connection to the network. All other workstation would remain functional. However, should the cable connecting the file server break or should the hub develop a fault, then the whole network would crash. All the same such faults are very easy to detect and verify. This topology is very reliable compared to the others. It involves a lot of cabling to its disadvantage. The library looks forward to a newer similar technology that is more intelligent, for should there be a break, the system would detect the break and ensure that the signals are re-routed. The Ring bus would have been another third network topology for consideration. It is very much like the Linear bus except that instead of using

electrical resistors to terminate the loose ends, the cable ends are connected to each other to form a ring, hence its name. It involves a co-axial cable being laid round the premises of the network site. All workstations and the file server are connected off the ring. The network would crash should any cable in the network break. Locating such breaks is really tedious and taking a lot of time.

MIS PLATFORM STRATEGY

HARDWARE SYSTEM

The trends in the library MIS is currently towards using distributed computer architecture. There is network configuration of local area networking within buildings and within campus for on-campus users and wide area networking off-campus distanced users. End-user computing consist of microcomputers, office automation packages and data communication capabilities . The LAN and WAN data communication network consist of cabling within buildings and a wireless radio link between main campus (Kesese) and Chepkoilel campus 50km away, Town campus 35km away. The library connectivityto this topology is through its intranet besides internet and E-mail connected services. This network links all mechanized database controlled through library MIS, academic Register Information System (ARIS), Financial information System, Human Resources Management System. The following forms the configuration based on:

- workstations and server based on windows NT4.0 and internet via world wide web based on DIAL UP to ISP.
- Wireless radio links for the interconnecting the university all campuses, The Margaret Thatcher
- Library to the main administrative building, Chepkoilel and Town campuses. The cabling is based on UTP, fiber optic and wireless radio links.

The end-user connectivity takes the form of:

- Users directly accessing the library databases and electronic materials on CD-ROMS through the Intranet and via the OPACs,
- Users directly accessing the library web sites
- Users directly communicating with the library through E-mail
- Users directly accessing world Wide Webs via internet connectivity.

SOFTWARE SYSTEM

The key decision for the library is to make a choice on the library MIS operating system and software selection. Since the University MIS has a sub-sector information systems, it would be beneficial to use one network operating system throughoutthe University. Such benefits would include:

- Lower cost of support in terms of internal and external technical staff.
- Improved performance of the system in terms of speed of response and reliability.

- Lower cost of training for users and technical support staff.
- Simpler and quicker implementation of the system as users, only need to learn one type of access interface.

The library operating software system include:

- Tinlib Tseries 300 for bibliographic database
- Procite for widows abstracting and indexing
- Ms Exchange for E-mails
- Novel for network / server
- Windows NT4.0 server

All operating on Star Bus network topology and UTP cables constituting internal wiring with a hub terminal connectivity to the PCs.

There is a different level of software application in other University MIS sub-sector. For instance, IRM operates on:

- Delphi 3 Pegasus mail.
- windows NT server
- windows NT workstation
- Microsoft office.

ARIS application technologies are:

- Microsoft Windows NT workstation (support client applications campus-wide)
- Microsoft Windows NT server (file application and resource server software)
- Microsoft SQL server (ARIS database server software)
- Borland Delphi (ARIS application user interface)

This therefore calls for a certain level of integration and standardization within the University MIS sub-sectors. This transaction is necessary since there will be need for single end-user to make an inquiry involving accessing a range of information and where entry of transaction needs to update more than one system. But high risk posing system in terms of their respective databases may opt out of the MIS integration for data security purposes.

TECHNOLOGY CHANGE

PACE OF CHANGE

History holds that when organizations did select and install computer systems, the useful thing life expected for the system was 7 to 10 years. Now that the pace of technology development is very rapid, organization will expect to replace the systems within less than 3 years. The implication are that:

- Avoid taking several years developing and implementing a system because by the time it is fully operational, it will certainly be obsolete.
- There is no perfect system that will cover the library computer MIS. It important to note that systems implementation is a continues process.
- Library management and staff have to change their working habits in order to exploit the continues change in the application of information system and technology.

PREDICTING THE FUTURE

Given the history of computer technology, there is every possibility for the predicting developments in the ICT industry. There is therefore need to consider ICT rapid development in the light of the following:

- The likely future trends of using wireless connectivity and networks between terminals.
- The use of World Wide Web via internet for sharing and communicating information for teaching and research.
- The use of voice recognition systems and hand writing recognition systems are apparent for the present era.
- Reduction in size and weight of computers is certainly influencing the working pattern of people who are the library end-users, for instance working from home and away from the organizations.

CONTINGENCY PLANNING

Contingency planning strategy is the process which aims to encounter the effects of potential disaster affecting IT capability ensuring that it can commence operations as quickly as possible. In this case there has to be a clear view of what constitute the minimum combination of required hardware configuration to ensure the system continue to operate whatever the crises.

CONCLUSION

There is need of greater use of information resources and information technology to support the vision, mission and objectives of the technologically oriented university. There is a tremendous demand in perfecting the library system which has totake into account information accessibility and flow. Thus application of state of the art ICT will enhance the quality of services offered. Therefore having a library computer information system will offer enhance services in the area of sharing information and communication besides easing access to information resources, courses and faculty members.

REFERENCES

Bhatnagar, S.C. and Bjorn-Andersen. 1990. In Information technologies in developing countries, N. (ed.).

Amsterdam: Elsevier Science Publishers.

Shibanda, Gundu. 1994. Collection development as performance management. Library review, volume 43,

No. 8.

Shibanda, Gundu G. 2002. Multimedia computer utility framework intervention for Moi University

Management Information System. Campus-Wide Information Systems: The Journal of Technology on

Campus, volume 19 number 2.