

The Role of ICT in Kenya's Public Universities Academic Management

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Abstract

ICT has become an important tool in modern management of universities. This is because information is a critical ingredient in facilitating management decision-making and therefore, ICT is being seen as a crucial tool that can help in facilitating acquisition, use and management of this information. Despite the many efforts that have been put in place by the Kenyan government, the private sector and the institutions themselves to leverage the use of ICT in the higher educational institutions, there are still concerns over public universities integration of ICTs to enhance effective and efficient education management functions. This paper looks at how ICT can contribute to making academic management in Kenya's public universities more effective and efficient, and the challenges that require to be overcome in order to achieve this.

Key words: ICT, Integration, Academic Management, Effectiveness, Efficiency

1. Introduction

Information communication technologies (ICTs) at present are influencing every aspect of human life. They are playing salient roles in work places, business, education and entertainment. In higher educational institutions (HEIs), ICT has become an important tool in modern management. This is because information is a critical ingredient in facilitating management decision-making and therefore, ICT is being seen as a crucial tool that facilitates acquisition, use and management of this information. Manual and mechanical systems can no longer cope with the current demands of management processes in HEIs due to the fact that accurate and timely data is a critical resource in planning and decision-making (Acosta, 2004).

University education is of paramount importance to economic and social development. Universities have the responsibility of equipping individuals with advanced knowledge and skills required for positions of responsibility in government, business and the professions. These institutions produce new knowledge through research; serve as conduits for the transfer, adaptation and dissemination of knowledge generated elsewhere in the world and support government and business with advice and consultancy services. They also play important social roles by forging the national identity of the country and offering a forum for pluralistic debate (World Bank, 1994).

Despite the clear importance of investment in university education for economic growth and social development, the sector is in a crisis throughout the world. Universities are caught up in a time of rapid political, socio-economic and technological change. The numerous internal and external pressures on them demand a careful examination of educational practices from a new perspective to face challenges that lie ahead in knowledge-based societies (Pittinsky, 2003). These pressures include: A greater number and variety of higher education places without corresponding increases in funding (Phillips, 2005); a large population of learners from varied backgrounds, needs, motivations, abilities, learning preferences, time availability and course content requirements (Bates, 2000); a demand for more 'client' responsive and flexible courses (Ryan & Stedman, 2002); and the drive to use ICT in teaching and administration (Challis, Holt & Rice, 2005). In

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facing such challenges, higher education needs to rethink organizational structures, operational strategies, and policies appropriate for the changing educational scene (Duderstadt, Atkins & Van Houweling, 2002).

Chacha (2004) while discussing emerging issues in higher education in Africa indicated that trends show that the rise of new stakeholders, internal factors, globalization and the rapid pace at which new knowledge is created and utilized, provide major challenges to higher education institutions across the world and Africa in particular. He further identified the key challenges of higher educational institutions as being, the drop in research and publication by faculty due to heavy teaching responsibility; poor leadership and management practices; poor remuneration of staff; diminishing financing; lack of quality standards to measure performance of the HEIs with their counterparts elsewhere; lack of jobs for graduates from the HEIs; gender inequality in favour of men; lack of further training opportunities; and lack of ICT capacity and utilization in the running of the institutions. As appertains to ICT utilization, the author noted that with the speed of ICT developments, their increasing spread and availability, there was need to tap the tools' potential to strengthen management information systems in HEIs.

According to Ngumbi (2010) effective management of the higher learning institutions has become one of the most challenging issues facing higher education in Kenya today. Failure to sufficiently address the emerging management challenges has impacted negatively on the growth of the institutions. Consequently, most of the country's higher learning institutions have suffered and continue to suffer financial losses, poor academic performance, staff dissatisfaction and their high turnover, loss of students and erosion of public confidence. The upshot of this has been a diluted quality of education and production of half-baked graduates; a direct threat to the attainment of the national development of the country.

The author further notes that the existing management practices in some universities are not adaptable to the 21st century higher education system which is characterized by massive technological expansion and development and cannot therefore propel the institutions to the full realization of their objectives. According to this author, the poor management is manifested in several forms such as breakdown in communication between heads of institutions, academic staff, students and other stakeholders; poor management and misuse of resources thereby denying essential services to students and staff; and failure by most heads of institutions to ensure quality assurance, either because they are not well equipped for that or they do not know that it is part of their responsibilities.

According to UNESCO (2009) the rapidly increasing student population in higher educational institutions accelerated the need for ICTs to process, store and retrieve data in a fast, systematic and accurate fashion. This source notes that on average, 57% of school-leavers in OECD countries went on to university in 2006, compared with 37% in 1995. The need to manage this increasing student numbers and monitor their progression through the education system required HEIs administrators to turn to ICTs for solutions. Similarly, the growing power, effectiveness and potential of ICTs also meant that technology could provide possibilities that did not exist three decades ago. Some examples of new ICT applications that became available to administrators included: eGovernance, online registration by students, online access to course outlines and materials, online assignment submissions, online examinations and online discussion forums with students and instructors. UNESCO (2009) further observes that as a result of applying ICTs in university administration, a dynamic new shift occurred in higher education where large and complex institutions could be created and function in a highly efficient and user friendly manner (e.g. the UK Open University with over 200,000 students).

Significant efforts to place ICT in the service of teaching, learning and management have been launched by most developing countries (Edmond, 2008). Kenya for instance drafted an ICT policy in January 2006. The policy objective that relate to ICT use in education seeks to encourage the use of Information Technology in schools, colleges, universities and other educational institutions in the country so as to enhance institutional management as well as improve the quality of teaching and learning (Republic of Kenya, 2006). In addition, the country's ministry of education articulated the role of ICT in education in documents such as Kenya Education Sector Support Program (KESSP). The KESSP provided a roadmap for investment in ICT in education and suggested provisional budgets to support educational activities. The

proposed investment programme on institutional management systems for instance was intended to achieve efficiency and effectiveness on management of institutional data, information, decision-making and administration as well as planning (Republic of Kenya, 2005).

As appertains to ICT initiatives, the government as well as most of the universities have invested heavily in ICT projects. Ndirangu and Kabira (2012) observe this by noting that key initiatives include the Kenya Education Network (KENET) Bandwidth Expansion Project at a cost of US\$ 12 million and the East African Marine Cable System at a cost of about Ksh. 6 billion. These authors add that universities are buying computers, increasing bandwidth and connectivity, as well as enhancing their other infrastructure to harness the potential of ICT use in education activities.

Despite the above efforts, Kashorda, Waema, Omosa and Kyalo (2007) on their study on E-readiness survey of higher educational institutions in Kenya note that HEIs in the country have many ICT projects and activities that do not support the core mission of the institutions such as improved learning outcomes of the graduates or management efficiency. In addition, although many of the Kenyan universities have implemented enterprise systems for finance and accounting, student admissions, examinations management and library services; there are significant differences in strengths and weaknesses among the private and public universities in the capabilities of the systems they have implemented. The public universities are noted to have weaker systems that are incapable of allowing seamless flow of information within their organizations sub units (Nyandiere, Kamuzora, Lukandu & Omwenga , 2012).

2. Integration of ICT in the Management of Higher Educational Institutions

Information and communications technology has revolutionized business organizations bringing forth new ways of doing business that are innovative, efficient and more effective. Organizations today confront new markets, new competition and increasing customer expectations hence the need to efficiently manage the information about competitors, their products, market trends, customer demands and technological developments (Laudon, 2000).

The emergence of fast and powerful computers, networks and Infrastructure has enhanced the delivery of immediate and relevant information which can enable policymakers in organizations to make quick and accurate decisions (Newmann, 1994). Laudon (2003) while commenting on the role of information systems in organizations indicates that ICTs provide tools for data collection, analysis, storage and dissemination to support decision making in organization.

University environments are equally changing in the technology front. Acosta (2004) notes that quick and accurate decisions of HEIs managers require readily available and relevant information, a fact that makes ICT a vital tool in today's HEIs business world. The author points out that HEIs too, must cope with the emerging trends of competing on the ICT platform, thus they need to continually assess their current status, and that of their competitors to formulate and manage their own strategies if only to stay abreast with the latest challenges of the information age.

UNESCO (2009) observes that using ICTs in higher education administration is fundamentally about harnessing technology for better planning, setting standards, effecting change and monitoring results of the core functions of universities. UNESCO further notes that more and more universities are looking into developing ICT applications that will do the following things:

- i. Improve on the quality and capacity of management information systems to support strategic decision-making and policy implementation.
- ii. Stimulate and facilitate free flow of information throughout the higher education system.
- iii. Respond to the needs and demands of the younger generation (especially the digital natives) for better and increased access to university services and information through the web.

According to Nyandiere (2007) information management in HEIs, like many other institutions, is shaped by the demands of the various entities that interact with the institutions both from within and from

outside. Wanjohi (2006) notes that within universities, information management focuses on staff, students and resources management. The information products include student details, that is, personal information of students and human resource (staff) information which includes records of employees in various cadres. The author further notes that under the academics, there are details of courses on offer in various departments, curriculum, examination details, professors teaching various courses, relevant books and journals and all relevant academic information necessary to enhance the core business of a university- teaching and research. In addition, there is financial information relating to fees payments, expenditures and donations.

Nyandiere (2007) points out that university integrated information management systems bring about faster and better decision making given their guaranteed access to high quality, accurate, well maintained and easily retrievable information. Notable systems implemented in universities include Enterprise Resource Planning (ERP) systems (popularly known as enterprise systems) which represent one of the largest investments of human and financial resources by many higher educational institutions (Dewey & DeBlois, 2006). Enterprise systems enhance standardization, streamlining of operations, and integration of business processes as a large number of stand-alone applications are replaced by one system that is comprehensive and on a single information and technology architecture (Sullivan & Bozeman, 2010). ERP benefits to a university generally include increased efficiency and effectiveness of processes, reduced ICT costs, improved decision making, better resources management, building business innovation and supporting strategic change (Sullivan & Bozeman, 2010; Roman, 2009 and Zornada & Velkavrh, 2005). However, due to the integration of various systems into one large system, enterprise systems implementation can be complex, costly and time consuming, and involving management, staff, consultants and vendors with possible conflicts between an established organizational culture and the “ERP” culture (Basoglu, Daim, Kerimoglu, 2007).

3. Factors influencing ICT Integration in HEIs Management

According to Tusubira and Mulira (2005) the integration of ICT in organizational functions is brought about by three main factors namely: Increased efficiency; costeffectiveness; and competitiveness.

Increased Efficiency

Management of information in the current business environment has become a powerful driver in performance of business processes as it determines organizational growth and sustainability (Siriginidi, 2007). With increased globalization, firms are facing unprecedented competition since they operate in a dynamic environment (Watanabe & Hobo, 2003). This has seen them invest heavily in information systems in the effort of integrating and coordinating their activities for efficiency and effectiveness.

The efficiencies which ICT may bring about into the universities can be realized in areas of ease of access to students and staff records, data on assets of the institutions as well as in front office operations and management of key processes like admissions and examinations (Tusubira & Mulira, 2005). Katz (2001) asserts that the ICT infrastructure is likely to influence and even shape the nature of higher education institutions and the practices of faculty and administrators. The author notes that the faculty, parents, staff and students are demanding more information from the HEIs in form of grades, loan payment and tracking, class registration and contract administration thus expecting HEIs information systems to operate automatically, be integrated and accessible to users 24 hours a day, 7 days a week, 365 days a year. Katz further points out that information resources and tools can be invoked to help guide increasingly complex and consequential institutional decisions through tools provided by the systems. HEIs thus are investing in systems that make it relatively easy and cost effective to acquire, store and manage volumes of information about institution’s stakeholders.

Cost Effectiveness

Information communication technologies are now fairly priced and therefore more affordable to many institutions (Nyandiere, 2007). On his part, Wanyembi (2002)points out that the strong interest in the adoption of ICT emerged in Sub-Saharan Africa for three reasons: firstly, revolution in ICT that has resulted

into computer systems -hardware and software- becoming cheaper, and therefore, more widely affordable; secondly, the substantial value added utility of ICT in the provision of, and access to, information services for improved planning and organizational management becoming more widely recognized; thirdly, international development agencies and donor countries have exerted significant pressure upon many governments, institutions of higher learning and other recipients of their aid to adapt extensive use of ICT to improve their work performance and organizational management. Golola (2005) points out that the speed of ICT developments, their increasing spread and availability, the nature of their content and their reducing cost, are major implications for teaching and learning, research, libraries and information services, and university management.

Competitiveness

Competition among various businesses is the main force behind strategic moves that each enterprise takes. Academic institutions are not spared from competition and therefore need to make strategic moves, especially taking advantage of information technology (Nyandiere, 2007). The author continues to posit that for HEIs to survive in this competition, they have to ensure that their processes are faster, less cumbersome and that the academic processes are designed in such a way as to facilitate faster data collection and dissemination for management decision-making. Alter (2001) supports this argument by noting that organizations invest in information systems because they believe the systems will make a difference in the way the organization conducts its business- processes and functions, basically giving the enterprise competitive advantage.

Glazer (1993) on his part argues that successful firms have invested in ICT like everyone else but

have differentiated themselves by viewing the management of information produced by these systems as being of paramount importance. This author continues to note that as these organizations identify the relationship between corporate and ICT strategies, they use information to integrate and manage links between the two- the corporate and ICT. Such organizations succeed because of their ability to differentiate themselves from their competitors, especially on the ICT platform. Supporting this view, Parker et al. (1988) maintain that justification for an ICT application should be based on one of two conditions; either it improves the performance of the current organization or it improves the outlook for new business opportunities and strategies of the enterprise. In addition, Hammer (1990) points out that the best rationale for acquiring ICT is strategic alignment of the business and the resultant benefits.

Wanyembi (2002) notes that colleges and universities in Kenya have felt the pressure to invest in computer-based information systems to manage their business processes and more so manage the vast amounts of data they handle. Accordingly, information and communications technology resources in Kenya continue to increase in numbers, value and sophistication as more and more institutions invest in new technology. Ahmad (2009) cautions that integrated information solutions give higher education institutions competitive advantages and thus institutions which might not switch to them will find it difficult to retain their market share of students. This is because students will sooner or later demand services offered by other institutions.

4. Implementation of ICT Integration for Institutional Management by Kenyan Universities

Kenyan universities, just like other business entities, are implementing various information systems to facilitate their operations. The systems include ERP systems which are implemented to enhance institutional management given their abilities to standardize, streamline operations, and integrate business processes (Nyandiere, Kamuzora, Lukandu & Omwenga, 2012). In their study, Nyandiere et al. (2012) established that Kenyan universities have mainly implemented systems for finance and accounting, student admissions, examinations management, and library services. The authors also established that there are no significant differences in information systems needs among Kenyan universities, but there are significant differences in strengths and weaknesses among the private and public universities in the capabilities of systems they have implemented. These authors further observed that despite fears especially on delays in projects

implementation and system costs, Kenyan universities are in a position to implement enterprise systems to facilitate their operations. They however noted that universities need to allocate more funds to systems implementation if they have to successfully implement enterprise systems which generally require more resources than ordinary software applications.

According to Nyandiere (2007) universities that have or are implementing computer-based systems take different strategies, but the most common is a combination of strategies. There are those that develop their applications internally. This assumes that the institution has enough capacity- finances and staff to undertake computerization projects. The demerit for this is usually poorly developed and implemented systems. This author further observes that where institutions want to guarantee quality, many go for off-the-shelf packages while others contract specialist developers to implement the systems. In such cases, Sevilla (2008) notes that an institution can choose to contract local vendors who understand standard commercial applications or go for international vendors with proven systems and long track records. The demerits here are that the former are often inexperienced on academic requirements and usually offer unclear long term sustainability and support while the latter are usually very expensive and may require expensive travelling.

In addition, Nyandire (2007) notes that some institutions are going for freeware or what are commonly referred to as Free and Open Source Software (FOSS). Here, the institutions customize these systems to their needs and where it is done well, there are no regrets. A good example in this front is Strathmore University in Kenya that has successfully implemented freeware systems to enhance its integrated management processes. One of the FOSS, the Academic Management System (AMS) has been customized and implemented to support the following academic sub processes: Admissions, registration, enrolment; course planning, resource allocation (e.g lecturers, classrooms, timetabling), tutoring/mentoring; class management (e.g lists, attendance); academic performance, examinations, academic records, certification, transcripts; and students financial records (i.e invoicing of fees, receipting of payments, account balances, debtors). In addition, the AMS has the following features: Is fully web-based and platform independent; offers proper access control (i.e administrators, lecturers, students, each access what is relevant); and the system integrates with other systems like Finance Management System (FMS), Integrated Library System (ILS) and Learning Management System (LMS) (Sevilla, 2008).

Ayoo (2006) in his report on the East African VarsityNet, a project of the Inter- University Council of East Africa (IUCEA), indicates that a number of universities already have information systems for handling students' records, some based on open source systems, others on proprietary software bought off the- shelf, while others are donated by international partners. The author further notes that many of the systems donated by international donors are experiencing support problems, especially after donors have left the scene, perhaps due to lack of local expertise to continue with their maintenance.

Sevilla (2008) cautions that implementing the right software is only part of the solution. He further argues that successful project implementation requires the following things: A full study of user requirements; an identification of functional procedures; full involvement and support from top management; proper change management (i.e adaptation of the system to the university and adaptation of the university to the system); and lastly adequate resources (i.e hardware and a committed project team). Sangrà and González (2004) adds that ICT integration must be done in an explicit, planned and systematic manner, involving the whole organization and their members on individual and collective levels so as to become a factor of change and improvement for the university. The institutional approach of this issue requires an active participation and the motivation of different agents within the institution, where faculty members and a strong institutional commitment are very important.

5. Challenges to ICT Integration in HEIs Management Processes

Many of the higher educational institutions (HEIs) have been shown to experience a number of challenges in their quest to integrate ICTs in their management processes. Using the case of Makerere University, Tusubira and Mulira (2005) capture some of these challenges as: Lack of awareness and mindset

among staff leading to unqualified resistance and wanting to be stuck to the old ways of working; lack of commitment from top level management thus bringing forth bureaucracies and red-tape in system implementation; lack of appreciation of ICT as a tool and not panacea for organizational transformation; poor strategy in making ICT responsive to the organizational vision and mission, with the thinking that ICT can set direction for an organization; lack of a systematic method of system implementation- integration of ICT in HEIs needs to be fully conceptualized and defined before implementation; lack of project ownership- all employees and users must be involved in system implementation; inhibiting initial costs of hardware and software and lack of funding for sustainability and continuity in maintenance, replacement of equipment and emolument of ICT staff who maintain the systems.

On his part, Chacha (2005) notes that there has been insufficient training and re-skilling of end users as well as technical staff that support the systems in HEIs. This is coupled with the inability of many institutions to recruit and retain qualified information systems staff. For some institutions, technological complexity results to the challenge of security concerns for the data and the systems, especially where students have to access the institutional systems. Wanjohi (2006) points out that without proper controls, students can hack into the systems and change examination grades, fees balance statuses or other modifications, which can have serious ramifications on the institution.

Laudon (2000) introduces the staff layoff challenge which comes with ICT integration that could lead to morale problems. The integration of departments leads to reduced need for many staff to man operations hence leading to staff layoffs. The institution may lack resources to compensate employees over their job loss and it is a painful experience to have to let go some staff that have worked with the institution for many years. Therefore, managers must anticipate resistance to information systems, especially when business process reengineering has to be undertaken.

6. Conclusion

The integration of information solutions gives higher education institutions competitive advantages. The institutions, which are unlikely to switch to integrated information solutions, will find it difficult to retain their market share of students. Students will sooner or later demand services offered by other institutions (Ahmad, 2009). The Kenya public universities are noted to have weaker systems that are incapable of allowing seamless flow of information within their organizations sub units. In most of these institutions, the ICT ecosystem is in the budding stages. There lacks an overall higher education ICT policy to provide a road map for ICT enabled educational management. Effective and sustainable ICT application in educational management is highly dependent on the elements of a country's ecosystem i.e. the strategies, processes, information technology applications and stakeholders to drive the course of action, and how they converge and intersect. The objectives of ICT integration in educational management cannot be realised without the basic infrastructure; right software; a full study of user requirements; an identification of functional procedures; full involvement and support from top management; proper change management and adequate resources (i.e hardware and a committed project team). The overall objective of integrating ICT in higher educational institutional management in Kenya and elsewhere should be within a strategy of improving efficiency and effectiveness in the institutions service delivery.

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