

Integration of ICT in Human Resource Management: Case of Kenyan Higher Education

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I. Introduction

Information communication technology (ICT) is currently influencing every aspect of human life. It is playing salient roles in work places, business, education and entertainment. In higher educational institutions (HEIs), ICT is being seen as a crucial tool that facilitates acquisition, use and management of information that is important in decision making. 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 information is a critical resource in planning and decision-making (Acosta, 2004).

Higher education on the other hand is of paramount importance to economic and social development of a country. HEIs 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 higher education for economic growth and social development, the sector is in a crisis throughout the world. HEIs 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: Need for 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, availability of time 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 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 indicate that trends show that the rise of new stakeholders, internal factors, globalization and the rapid pace at which new knowledge is being created and utilized, provide major challenges to higher education institutions across the world and Africa in particular. Chacha identifies lack of ICT capacity and utilization in the running of the institutions as being one of the key challenges facing higher educational institutions today and further notes that there is 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.

Ngumbi (2010) 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 Ngumbi, the poor management is manifested in forms such as breakdown in communication between the administrators of institutions, academic staff, students and other stakeholders. This breakdown often results to crisis that usually culminate to unrest and damages that could otherwise be avoided by availability of accurate and timely information, a product of effective integration of ICT in management processes.

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 related to ICT use in education sought 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 (RoK), 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 (RoK, 2005).

In terms of ICT initiatives, the government as well as most of the Kenyan universities have invested heavily in ICT projects. Ndirangu and Kabira (2012) observe this by noting that key projects 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 noted that HEIs in the country have many ICT projects and activities that do not support the core mission of the institutions including 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).

Proper integration of ICT into the higher education institutions management functions has been noted to improve the effectiveness and efficiency in their service delivery. The institutions, which are unlikely to switch to integrated information solutions, will find it difficult to retain their market share of clients. Students and staff will sooner or later demand services offered by other institutions (Ahmad, 2009). This paper discusses the transformation that the integration of ICT may bring about in the human resource management (HRM) process in Kenyan universities.

II. Integration Of ICT In Human Resource Management Of Higher Educational Institutions (Heis)

Information and communications technology has revolutionized HEIs management bringing forth new ways of doing business that are innovative, efficient and more effective. 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 must cope with the emerging trends of competing on the ICT platform and 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: Improve on the quality and capacity of management information systems to support strategic decision-making and policy implementation; stimulate and facilitate free flow of information throughout the higher education system; and respond to the needs and demands of the academic community (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.

On the side of human resource management, Rawat (2008) notes that integrated systems like the Human Resource Information System (HRIS) will enable universities to format a profile of their staff –their strengths and weaknesses- so as to know what they have in the human resource sense. Accordingly, they will be able to structure appropriate development, promotion, training and recruitment hence ensuring that institutions have the right personnel in all its sectors at the right time and in the right numbers. Rawat (2008) also argues that nowadays higher education institutions face a significant task of improving learning environments at reduced administrative operating cost. Moreover, the ability to effectively budget for and manage different types

of employees, recruit and retain skilled members requires full integration of HR data with student information systems.

According to UNESCO (2011) Hong Kong University (HKU) which is the oldest tertiary education institution in Hong Kong and recognized as a high ranking international university, has integrated ICT in human resource management. UNESCO observes that HKU has implemented the use of Oracle's PeopleSoft software to support staff selection, recruitment and appointment, contractual agreements, performance management and staff development among other HRM functions. The university expects to draw the following long term sustainable benefits from this integration: Firstly, improved efficiency of the Human Resource (HR) and Finance and Enterprises Office (FEO) operations with minimal errors. This will be achieved through the introduction of staff self-service capability, elimination of duplicate handling of data, data capturing and verification at the source with inbuilt data validation tools, and well integrated and support interfaces to other applications at the university; secondly, improved quality and timeliness of HR, budgeting and payroll management and operational information and reporting. This will be achieved through maintaining all data in a single integrated and trusted database for use by all applications, use of inbuilt data validation techniques and easy and ready reporting; thirdly, improved transparency, user experience and understanding. This is because information provided by the system is accurate, relevant and readily accessible, the interaction between HR and FEO appear seamless to the user of HR services, and more self-service functions are available to managers, staff members and job applicants; and fourthly, reduction of the use, physical flow and storage of paper. Here hard copies are set to be eliminated and replaced by computer-generated email notifications, benefits applications can be submitted and handled online, and the electronic database that captures personal and employment records can be easily accessed by authorized persons.

III. The Influence of ICT Integration on Organizational Management

According to Tusubira and Mulira (2005) the integration of ICT in organizational functions brings about three main benefits namely: Increased efficiency; cost effectiveness; and competitiveness.

3.1 Increased Efficiency In Organizational Management Services

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 HRM can be realized in areas of ease of access to staff records (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 and staff are demanding more information from the HEIs about their recruitment and appointment; development and training; performance management; salary administration etc. 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.

ICT based systems such as the integrated human resource management information system support planning, general administration, decision making and control functions of an organization. The system also support applications such as employee selection and placement, payroll, pension and benefits management, intake and training projections, performance and productivity evaluation. The information system increases administrative efficiency, produces reports capable of improving decision-making and enhances accountability in service delivery (Gerardine, 2006)

3.2 Cost Effectiveness In Organizational Management Functions

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 human resource management in HEIs among other institutional management processes.

3.3 Organization's Competitiveness

Competition among various businesses is the main force behind strategic moves that each enterprise takes. Academic institutions are not spared from competition for excellence 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 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.

Regionally most organizations including universities have embraced integrated information systems to automate their business processes in order to decrease costs, enhance efficiency and gain competitive position over their competitors (Nour and Mouakket, 2011). With the advent of electronic business and increased importance to leveraging of various sources of information within an organization, information solutions such as Enterprise Resource Planning (ERP) software has come out as a major area of interest to most organizations (Hendrickson, 2010). This author further notes that successfully implemented ICT integration can benefit an organization tremendously even though expensive to acquire. For instance, an organization benefits from it by having increased customer service and reduced manufacturing or production costs.

IV. Integration of ICT in Kenyan HEIs

Kenyan universities, just like other institutions elsewhere in the world, are implementing various information systems to facilitate their operations. They 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.

Kenyatta University (KU) has implemented multiple integrated Management Information Systems (MIS) which include: UNIPLUS for registration (allowing students to register online), student finance (allowing students to check their fee balance online), and examinations (allowing students to check their results online); the Sage Accpac Enterprise Resource Planning (ERP) system, which integrates all financial data and processes of KU into a consolidated system; the Human Resource MIS, which captures staff records and staff-related processes (SAIDE& RUFORUM, 2010).

According to SAIDE and RUFORUM (2010) the impact of the MIS on KU has been that with an initial investment of \$198,000 (the cost of management and administration software), KU has accomplished the following: Financial gain of \$4 million a year as a result of being able to track student non-payment of fees; an increase in the number of graduates as administration systems now contain less room for human error, prevent against loss of student records and enable quicker processing of marks; improved efficiency for lecturers who are able to enter examination

marks electronically as soon as they are available; and improved institutional expansion strategy enabled by increased fee collection.

In a study to assess the implementation of ERPs in Kenyan public universities using a case of Masinde Muliro University of Science and Technology, Makokha, Musiega and Juma (2013) found out that 85% of implementation of ERP system was accounted for by integration of Human Resource, Finance, Procurement, Students Affairs and Computer Science. The study also revealed that gender and duration of use of ERP system were significant to their implementation where 28.8% of implementation of ERP system was accounted for by gender and duration of use.

Another study to assess the utilization of human resource information system (HRIS) by Kananu and Nyakego (2015) established that the sampled institutions used both the automated and the manual HRIS. The HRIS was found to be commonly used for payroll and record management, recruitment, promotions and skills inventory. The study recommended that the management of Kenyan universities should allocate adequate resources for the implementation and maintenance of the system. It also recommended that since the universities had adopted different types of HRIS, these systems needed to be integrated in order to increase availability and readiness of information to support top management on decision making.

In terms of the quality and manner of implementation, Nyandiere (2007) posits that 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.

V. Challenges To Effective Integration Of ICT 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 hackers access the institutional systems. Wanjohi (2006) points out that without proper controls, hackers break into systems and make changes and 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.

VI. Factors That Lead To Successful Implementation Of Icts In Heis

Information communication technologies implementation in HEIs if not well handled may lead to heavy investment without corresponding organizational benefits. Tusubira and Mulira (2005) point out that HEIs in Africa should have mechanisms for implementing information systems by optimizing scarce resources, skills

and technology to implement and sustain robust infrastructure that supports education and training. According to Nyandiere (2007) successful implementation of information systems for HEIs should focus on three key areas namely: Institution's strategic management, ICT strategic planning, and a fully conceptualized and defined ICT integration.

6.1 Institution's Strategic Management

Laudon (2003) notes that ICT is a strategic investment for any organization. Strategic management of organizations implies a conscious and coordinated management of organizational activities, processes and resources for greater returns. This requires strategic planning to develop long-term objectives for the entire organization and business units and to specify strategies for acquisition of resources needed to accomplish objectives. Robson and David (2004) point out that strategic planning establishes broad, long-term objectives of the firm and assesses the institution's current position relative to these objectives, considering opportunities and threats presented by the environment. This entails analysis of strengths, weaknesses, opportunities and threats (SWOT analysis). Strategic planning also outlines the organizational structure and total resources needed to implement the plan, and plans for the implementation process.

With strategic planning at organizational level, top level management commitment to ICT implementation and definition of the appreciation of the role of ICT as a tool rather than panacea for organizational transformation is explained and understood (Tusubira & Mulira, 2005). The two argue that with strategic planning, it is possible to create ownership of ICT projects by getting stakeholder groups to think through the shortcomings of the organization and recommend where ICT can be taken on board as part of a complete package of organizational transformation and thus providing for ICT strategic planning.

6.2 Institution's Ict Strategic Planning

Newmann (1994) argues that to enhance strategic management, businesses do implement strategic information systems. These systems, which are an outcome of information technology strategic planning, support or shape a business unit's competitive strategy. ICT strategic planning, whose outcome is an ICT policy and master plan, makes ICT responsive to the organizational vision and mission, providing systematic methods of implementation through organizational ICT policies, and creating ownership of projects hence leading to sustainability and long term returns from ICTs (Tusubira & Mulira, 2005). The authors further argue that a well defined and owned ICT policy and master plan is a prerequisite to successful mobilization of funds, both internally and externally, for system implementation.

6.3 Conceptualizing And Defining ICT Integration In Institutional Functions

Integration of ICT in an organization's functions is a complex process which needs to be fully conceptualized and defined before implementation to avoid dissipation of resources through implementation of unrelated or uncoordinated projects (Tusubira & Mulira, 2005). With their experiences at Makerere University, these authors argue that there is need to quantify the requirements of the institution starting from the number of students and staff, the extent of physical infrastructure, ICT resources and systems already in use. This sets the direction, functions and boundaries as well as targets of ICT in the organization, providing a framework for the development of specific projects aimed at increasing efficiency and cost effectiveness. The ICT policy and master plan alluded to under ICT strategic planning should reassure employees, fearing job loss, by catering for training and retraining and opening up new opportunities for them. They need to recognize that they are part of the information system and therefore major stakeholders.

VII. 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 and staff. HEIs customers will sooner or later demand services offered by other institutions (Ahmad, 2009). In most of Kenyan HEIs, 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 HEIs 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 objective of ICT integration in HEIs human resource management cannot be realized 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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