Influence of Information Technology Infrastructure on Adoption of Human Resource Information Management System in Public Universities in Kenya: Case of Masinde Muliro University of Science and Technology

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Abstract: Introduction of information systems has changed the way people deliver their work activities. The use of Human Resource Information Systems has led to valuable outcomes for the organization such as decreased costs, improved communication, and decreased time spent on mundane activities. However the development of a standard system for the management of human resource information has remained a major challenge to organizations. This problem is most profound in public universities who have not embraced technological systems to manage the people who work for them. The purpose of this study was to investigate the influence of information infrastrutucre on adoption of Human Resource Information System in public universities in Kenya; case of Masinde Muliro University of Science and Technology. This study was based on the reasoned action theory, theory of planned behaviour, the technology acceptance models. The theory and model informed the conceptual framework that was developed. This study adopted a descriptive research design in order to study the relationship. The study target population was 1300 employees from which 245were selected to particpate in the study who were categorized into teaching and non-teaching staff selected using simple random sampling technique. The main method of data collection was a structured questionnaire which had both open-ended and close-ended statements. Both Primary and secondary data was collected for the study. Before data was collected all necessary ethical consideration were adhered to including seeking necessary permission. Data that was collected was analyzed using descriptive and inferential statistical. Descriptive statistics involved the use of frequencies and percentages. Inferential statistics involved Pearson correlation and regression analysis using IBM Statistical Package for Social Sciences (IBM SPSS) Version 22. This study found a significant and positive relationship betweentechnology infrastructure. The study therefore concluded that for adoption of human resource information management systems information technology infrastructurewas very critical factor. However this study recommends more research to be conducted to find out other factors which inhibit adoption of HRIS and which were not considered in this study.

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I. Background to the Study

In today's knowledge economy, organizations can succeed only if their human resources perform optimally (Amani & Jabeen, 2013). This is a major responsibility that comes with a lot of challenges which such as advances in technology which necessitate redesigning of jobs and constant modifications in recruiting, selection, training and appraisal techniques; the globalization of businesses and the need to educate and train managers on dealing with the complexities of a global economy and the move towards a knowledge based economy, where value of the company depends on its employees' skills and knowledge (Nisha , Kumar, Vinita, & Thite, 2014)According to Bader (2012), one of the strategies organizations are using to better themselves is the incorporation of information technology (IT) in the way they manage their outputs. The traditional ways which were used in the management of human resource services within businesses and public organizations today are being challenged by digital possibilities (Mohamed, 2016). Dessler and Al Ariss (2012) confirm that good management means the use of appropriate procedures and practices that can ensure the smooth running of organizations. While it is true that there is need for organizations to treat information as any other resource, the information must have good organization, management and disseminated effectively hence the need and rise of use of information systems within organizations (Troshan, Jerram, & Hill, 2011).

Information systems and their impact on HRM have been given a great deal of attention over the past sixty years because of the availability of more data about the business and computerized information among key business actors (Al-Mobaideen, Allahawiah, & Basioni, 2013). Researchers have had a global consensus on how human resource information system (HRIS) can be defined. Kavanagh, Thite, and Johnson (2012), considers HRIS as a system of acquiring, storing, manipulating and retrieving information and which is seen as part of the overall organizational information system which is created to help any organization to perform better. Kumar and Parumasur (2013) not only agree with this definition but also contribute by observing HRIS as not being simply a computer hardware and associated HR-related software but which includes data, people and policies.

Saleem (2012) indicated that one of the main expectations for change to use HRIS has been how it can contribute to organization's HR strategic activities and help in business planning. For example, adopting HRIS leads to the provision of a single, safe repository for confidential HR information. Another aspect is that availability of low cost, generic, flexible, easy to install and easily customizable window based products helps in developing affordable, easily customizable, modular HRIS with enhanced reporting capabilities, safe repository for confidential HR information available from any place where internet is accessible which lead to reducing redundancy within the organization due its centrality of information (Lucerna 2013; Nguyen, Sununta, & Page, 2013).

HRIS combines People and information which are the two fundamental resources organizations. People and information can generally influence a business overall performance (Charkaborty & Nur, 2013). For enhanced sense of fairness and job satisfaction in organizations, it is essential to provide employees with access to their information which increases the transparency of HR processes. This helps them to get to understand better the effect of HR in the firm and make them feel they have control over their information (Johnson &Gueutal, 2012).

The success of the adoption of HRIS in Kenyan Universities and in other developing countries has not been achieved (Markova, 2012). This is because of various reasons which include lack of commitment from top management, inadequate knowledge, and lack of expertise in using HRIS, unavailability of suitable HRIS, uncertainty and lack of trust on HRIS processes. Studies done in Bangladesh (Abdul Kadar et al., 2013) revealed that only 22.9 % of the Universities utilized HRIS 100% and that there was both lack of infrastructural Development expertise and insufficient training of the employees. The Kenya Health Workforce Information System (KHWIS) has also been identified as a promising example of a functioning HRIS.Kenya Commercial Bank (KCB) employs oracle based HRIS to keep pace with the changing organization workforce needs(Preet, Sunita&Samim, 2011).

Nisha et al (2014) found out that universities nowadays face challenges similar to those found in many large corporations. According to literature review, there is little attention which has been given to the finding out factors which may inhibit or promote the adoption of HRIS within organizations (Troshani et al., 2011). As Kananu and Nyangeko (2015) point out, most public Universities have weaknesses in delivering human resource services because of the continued use of manual human resource Systems. This is evidenced by the limitations faced in acquiring, storing, manipulating, analyzing, retrieval and distribution of the very important human resource information in these institutions.

Organizations are today recognizing the importance of effective Information Technology Infrastructure (ITI). ITI effectiveness can be assessed using criteria such as reliability, operation with low downtime; flexibility, efficiently adapting to changing business requirementsand upgradability, efficiently adapting to or deploying multiple, complex technologies as required. By creating relevant, timely and flexible ITI, companies are more likely to sense customer's interests so that they can respond in timely manner (Gheysariet al, 2012). The key to success, according to Chien and Tsaur (2010) lies in a solid information system infrastructure seamlessly aligned with the core business processes. This study, therefore, seeks to find out how information technology infrastructure affects the adoption of HRIS in Public Universities with a focus on Masinde Muliro University of Science and Technology.

1.2 Statement of the Problem

The adoptionofHRIShasnotbeengivenmuchattentioninmostKenyanuniversities (Kinanga, 2013; Markova, 2012;Troshani*et al*., 2011). Apart from lack of policy frameworks to guide HRIS so far, there is also lack of effort in anchoring the same in the University performance contracts signed from time to time between the Government of Kenya and public Universities. It is also policy now that for universities to be accredited they must be ISO certified with proper documentation of information which can be easily retrieved, accessed from anywhere any time, proper accountability of university assets, and preservation of the institutional memory (CUE, 2014). Most Universities have tended to shift from the utilization of manual human resource systems to use of HRIS (Kananu&Nyangeko, 2015). It is expected that once universities innovatively install and harness HRIS, it will act as an invaluable tool in assisting University Administration to effectively respond

to management of human resource and development, internal and external economic challenges as well as comply with reporting requirements accruing from HRIS. HRIS will provide an innovative, efficient and effective way of enhancing the management and development of human resource, financial resource planning and timely service provision (Aggarwal & Kapoor, 2012). Several studies have been conducted on the importance role of using HRIS (Yasemin*et al*., 2014; Kitone&Omieno, 2013; Okinyi, Omieno&Kitone, 2013). However, HRIS adoption is still an area that requires more and in-depth research especially in most public universities (Markova, 2012; Troshani*et al*., 2011). Concentrations on the critical factors that must be considered before the adoption of HRIS have been over looked (Ahmer, 2013; Nisha *et al*., 2014). Adoption is not embraced yet universities are centres of information transfer. It is on this basis that the researcher found it a gap to do a study on the factors that affect the adoption of HRIS in public universities a case of Masinde Muliro University of Science and Technology.

1.3 Objectives of the Study
The objective of this study was to identify influenceof information technology infrastructure on adoption of human resource management information system in public universities in Kenya.

1.4 The Research Question
The question that the study set to answer was "How does information technology infrastructure affect adoption of human resource information system in public universities?

1. 5 Significance of the Study
This study's findings were aimed at benefiting the Universities and academic institutions in general, especially in developing countries like Kenya where innovativeness is needed at the work place. They could benefit from this research since it will provide them with the much needed insight on the factors required in order to adopt HRIS in the institutions of high learning and especially the heads of the HR departments. The study could also provide information to the government and regulators such as Commission for University Education (CUE). The study was also expected to provide a body of knowledge to prospective researchers to explore more on issues relating to the effects of HRIS on organizations. Researchers who are doing related study might use this research as their secondary data. They could also conduct another research in the same way to weigh and compare the outcome.

1.6 Scope of the Study
This study was restricted to challenges affecting how HRIS is adopted in Public Universities with specific interest on Masinde Muliro University of Science and Technology (MMUST), a public university in Kenya located in Kakamega County along Kisumu-Webuye high way. It is 1 Km away from Kakamega Central Business District on the Kakamega- Webuye Road. It is a healthy ground for academics, research and innovation. The approximate population of staff is 1,300 (MMUST strategic plan, 2017).
The study limited itself to investigation of ease of use, Usefulness, Technological Infrastructure and determining how individual experience with computer affected HRIS's adoption in Public Universities. The population which was targeted included the teaching and non-teaching staff of MMUST. The study was took a period of one year for its completeness.

II. Literature Review
This study was based on a collection of interrelated theories and models. The study was hinged on the technology Acceptance Modes (Davis, 1989, Vankatesh& Davis, 2000) and the theories of reasoned Action (Fishbein&Ajzen, 1975) and planned Behavior (Taylor & Todd, 2001).
Information Technology infrastructure (ITI) is a resource and capability which acts as the foundation and hence enables information sharing through the interaction between technology and people (YanXia & Saeed, 2015). Information technology infrastructure allows an organization to deliver information Technology (IT) solutions and services to its employees, partners and/or customers and is usually internal to an organization and deployed within owned facilities (Chauhan, Sanjeev, & Tarun, 2011). Information Technology Infrastructure has been defined as a shared, tangible, technological resource including platform technologies, networks and telecommunication technologies, data, and software applications (Anitha & Aruna, 2015).
According to Ireri (2015) infrastructure consist of all gadgets which can used connect several computers and the people using them. It includes media used to transmit information such as telephone lines, television cable lines, and satellites and antennas. (Alshawi, 2010). It may also include routers, aggregators, repeaters, and other devices that control transmission paths (Bader Y. O., 2012). Infrastructure refers to interconnecting hardware and software and not to computers and other devices that are interconnected. Lack of IT infrastructure affect the adoption of advanced IT (Chinyanyu, 2011).

Organizations are today recognizing the importance of effective Information Technology Infrastructure (ITI) while the development and operation of flexible ITI is of administrative concern. ITI effectiveness can be assessed using criteria such as reliability, operation with low downtime; flexibility, efficiently adapting to changing business requirements; and upgradability, efficiently adapting to or deploying multiple, complex technologies as required. By creating relevant, timely and flexible ITI, companies are more likely to sense customer's interests so that they can respond in timely manner (Gheysariet al, 2012). The key to success, according to Chien and Tsaur (2010) lies in a solid information system infrastructure seamlessly aligned with the core business processes.

A flexible firm has the ability to efficiently adapt its IT to the many changes in strategy direction. For a firm to attain its business goals, it should invest both in IT technical and human capabilities which are the agility and versatility necessary to survive in the present competitive environment (Xianfenget al., 2008). Chakraborty and Mansor (2013) couldn't agree more by confirming that effective adoption of HRIS will depend on organizations technology infrastructure and IT human resources. The researcher continues by pointing out that this will only depend on knowledge and skills of IT experts and that they use to build a web application, technology infrastructure that make an easier base on which internet technologies can be created and conclude by affirming that these are the factors that allow technological capacity of an organization to adopt HRIS (Rand et al., 2014).

Oliveira and Martins (2010) HRIS can be an important part in an organization if the organization has infrastructures and technical skills. Infrastructures and technical skills allow the organization to technological capacity to adopt HRIS. Rand and Zubi (2014) notes that since organizations with superior technology readiness are in a better position to adopt HRIS, companies that do not have strong technology infrastructure and wide IT expertise may not take the risk of adopting HRIS as has been revealed by research.

The relationship between information technology infrastructure and adoption of human resource information management system are thought by this study to be related as shown on this conceptual framework.

Information Technology Infrastructure	Adoption of HRIS
• Number of Hardware infrastructure • Number of Software	• Actual % usage • Intent to use Level

III. Methodology

3.1 Research Design

This study adopted a descriptive survey research design. Descriptive survey research design is used to describe characteristics of a population (Kothari, 2014).It is normally used tocollect data about variables of subjects as they are found in a social system describing the state of affairs as they exist at that time (Kothari & Garg, 2014). Descriptive survey research design allows study of large numbers of people and describes their characteristics by the selection of unbiased sample using methods of data collection and analysis that can be used to make generalizations about the population. Descriptive surveys provide the best methods for collecting information that will demonstrate relationships (Shields & Rangarjan, 2013). This design was chosen because of its ability to allow the use of both qualitative and quantitative approaches to enhance comprehensive data collection and analysis (Saunders, 2016).

3.2 Target Population, sample size and Sampling Procedure

The target population of the study comprised of all employees of MMUST which according to staff establishment data obtained from Registrar Administration in February, 2017 was 1300 which was made up of 300 teaching and 1000 non- teaching. The population that was targeted was suitable for this study since MMUST University is a good example of a public university that wants to adopt HRIS for its functions. The sample size was developed from the list of teaching and non-teaching staff provided by the Registrar Administration office. From the sample frame random numbers were generated which assisted to obtain a total sample size of 245 personnel to participate in this study.To obtain required sample, the target population was stratified into teaching and non-teaching staff in order to obtain the correct sample for each stratum (Kothari & Garg, 2014). In simple random sampling the researcher generated random numbers from the sampling frame using random number generation software which enabled the researcher to give each element in the population equal chance of participating in the study thus resulting in more reliable sample. A sample of 245 workers at Masinde University of Science and Technology were selected to participate in the study.

3.3Data Collection Instrument andProcedure

This study collected both primary and secondary data. Primary data was collected using a questionnaire on the variables associated in the study. The questionnaire was structured as all statements were presented with exactly the same wording and in the same order to all respondents (Kothari, 2014). Similarly all respondents replied to the same set of questions. The questionnaire was measured using a five-point Likert scale (Mugenda & Mugenda, 2014). Secondary data was gathered from existing theoretical and empirical sources that were found to be credible in literature review. The secondary collected comprised of materials that are current, accurate, sufficient and relevant. These materials were collected from Library textbooks, internet/e-resources, magazines and personnel files in the organization.

3.4 Pilot Test and Data Analysis

A pilot test was done to determine the reliability and validity of the data to be collected. A sample of 10% of the total sample was selected from employees of Kaimosi Friends University College. The Pilot study helped to detect the weakness in design and instrumentation and provided accurate data for sample selection (Gujarati & Porter, 2010). Piloting was needed in order to identify and eliminate errors in the questionnaire (Saunders et al., 2011). This sample for pilot test was randomly selected in order to give each subject an equal chance of participating in the pilot study and remove bias. The data collected from the pilot study was analyzed using quantitative techniques such as measures of frequencies, percentages and other measures of central tendency. Respondents used in the pilot study were not allowed to participate in the final study sample. The data which was collected in the final study was analysed was both quantitative and qualitative methods. Quantitative data was analyzed using descriptive statistics and inferential analysis via the Statistical Package for Social Sciences (SPSS). From descriptive analysis technique simple summaries have been obtained and presented quantitatively in a manageable form (Cooper & Schindler, 2011). The descriptive statistics obtained were based on frequencies and percentages and presented in tables. Pearson correlation and multiple linear regression analysis have been conducted to establish the strength and coefficients of relationship between the independent and dependent variables (Gujarati & Porter, 2010). The reason for doing correlations was to allow this study to make a prediction on whether independent variables had an association with dependent variables and the nature of the relationship. The following regression equation was set to be tested.

IV. Results, Findings and Discussions

4.1 Descriptive Resultson Demographic Characteristics

The results from the pilot test indicated a validity factor analysis index of 0.780 with a reliability Cronbach's alpha 0.799 for information technology infrastructure and 0.726 for adoption of HRIS. Out of a total of 245 questionnaires which were administered 191 fully filled questionnaires were collected. This constituted 64% response rate. The results on demographic information indicated that 91(47%) were women while 100(53%); on education 38(20%) had diploma education, 67(35%) had bachelor degree, 57(30%) had master degree while 29(15%) had PhD qualification. On work experience 29(15%) had worked for less than one year, 57(30%) had worked for 1-2 years, 57(30%) had worked for between 3-5 years while 48(25%) had worked for over five years. On position in the organization 84(44%) were teaching staff while 107(56%) were from the non-teaching staff.

4.2Descriptive Resultson Information Technology Infrastructure

To determine the influence of information technology infrastructure, the respondents were given five statements. The respondents were asked to rate the statement provided based on adoption of HRIS. Influence of information technology infrastructure was conceptualized on a Likert scale ranging from 1-strongly disagrees to 5- strongly agree. Respondents were asked to whether 'there was internet access to support HRIS adoption,' 177(93%) agreed, while 14(7%) disagreed. On the statement, 'employees are allowed to use mobile phones to access organization HRIS,' 51(27%) disagreed, while 140(73%) agreed. On the statement, 'the institution is highly computerized with network connections,' 164(86%) agreed, while 27(14%) disagreed.

4.2 Descriptive Results on Adoption of HRIS

The study wanted to evaluate whether public universities had adopted HRIS in the performance of human resource functions. Adoption of HRIS was conceptualized using eight statements. The researcher asked respondents to rate the statement provided based on a Likert scale ranging from 1-strongly disagree to 5- strongly agree. Descriptive results which were obtained show how respondents rated adoption of HRIS at Masinde University of science and technology. Responses on the statements are as indicated. For example on the statement that 'the institution publicizes most of its policies and programmes through HRIS,' 50(26%) disagreed, while 141(74%) agreed. On the statement, 'HRIS stores most of the institutional data, 34(19%)

disagreed, while 157(82%) agreed. On the statement, 'employees are allowed access to HRIS, 108(56%) disagreed, while 88(44%) agreed.

4.3 Correlation Analysis Between technology infrastructure and adoption of HRIS

Correlation analysis was done to find out whether information technology infrastructure had a relationship with adoption of HRIS in Masinde Muliro University. The correlation results indicate that information technology infrastructure is positively related to the adoption of HRIS at MMUST. The relationship is positive and very significant at r=.520, p=.000.

V. Summary of Findings, Conclusions and Recommendations

5.1 Summary

This study aimed to investigate the extent to which information technology infrastructure affected the adoption of human resource information system in public universities. Majority of employees who participated in this study agreed to the statements which were used to rate effect of information technology infrastructure on adoption of HRIS. Further, the study found a positive and significant relationship between information technology infrastructure and adoption of HRIS since the coefficient of relationship was positive. From the regression analysis it was also found that information technology infrastructure caused variations in adoption of HRIS.

5.2 Conclusions

This study aimed to investigate the extent to which information technology infrastructure affected the adoption of human resource information system in public universities. Majority of employees who participated in this study agreed to the statements which were used to rate effect of information technology infrastructure on adoption of HRIS. Further the study found a positive and significant relationship between information technology infrastructure and adoption of HRIS since the coefficient of relationship was positive. From the regression analysis it was also found that information technology infrastructure caused variations in adoption of HRIS. The study therefore concludes that information technology infrastructure is an important factor that affects the adoption of HRIS in public universities in Kenya particularly at MMUST. Therefore in implementing or adopting HRIS it is important to consider the information technology infrastructure in place before adopting the system and using it.

The study found Sector policy as an important factor for achieving success in implementation of water projects in Vihiga County. Policy on community participation was found to be very important as enhancing community participation could lead to sustainability of rural water supplies. More importantly the study shows project implementation is a multi-sector issue requiring interdependent actions of many stakeholders at all levels including national and regional governments, the private sector, development partners and the community itself. Communities on their own cannot be expected to achieve successful implementation of projects without an enabling environment. The successful implementation of water projects require deliberate steps such as putting in place policy frameworks needed to achieve it.

5.3 Recommendations

The study identifies that Information technology infrastructure is an important factor affecting adoption of HRIS in universities. The study therefore recommends that HRIS could be better applied in universities if they were adequate infrastructure which could allow workers ease access to the system. Information technology infrastructure is an important factor when adopting a computer system such as HRIS as it is important in the HR function and its contribution to the strategic achievement.

5.4 Suggestions for Future Studies

This study focused on the influence of information technology infrastructure on adoption of HRIS in public universities. This study recommends the need to do similar studies on other factors affecting the adoption of HRIS in the same universities and other universities, both private and public to determine if the results would be the same or different.

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