National Journal of Advanced Research
ISSN: 2455-216X
Impact Factor: RJIF 5.12
www.allnationaljournal.com
Volume 4; Issue 3; September 2018; Page No. 54-61

The role of ERP in accessing data in the management of academic affairs in public universities in Kenya

Dr. Berita Singoro
Deputy Principal, Friend Secondary School Kimugui Girls, Kenya

Abstract
The role of ERP cannot be underestimated in universities in Kenya. ERP is key in ensuring production of consistent, confidential, standardized and centralized data. The purpose of this paper is to establish the role of ERP in accessing data in the management of academic affairs in selected public universities in western region of Kenya. The objective was to determine the role of ERP in accessing data in the management of academic affairs in public universities in western region of Kenya. The study employed a descriptive study design and used questionnaire and interview schedules to obtain data. A sample of 16 DVCs and academic Registrars, 8 IT technicians, 120 Deans of faculties/schools and CODs and 320 lecturers were selected for the study from 8 universities. A total of 464 respondents participated in the study. Purposive sampling technique was used to select universities and respondents for the study. Lecturers were selected using proportionate stratified random sampling technique according to the courses they teach. The instruments of data collection were the questionnaire, interview schedules and content analysis. The data collected were analyzed using descriptive statistics of mean, frequencies and percentages and inferential statistics; chi square. The study found out that ERP provided security to examination data. Data was standardized, consistent, confidential and centralized. The study concluded that ERP systems contributed to improved data management as compared to the management information systems because ERP IS advanced in standardizing and centralizing data. The university academic staff members are encouraged to embrace the use of ERP systems to improve on timely data management of examination processes. The university academic staff members are encouraged to demystify the complexities of using ERP in order to reap the benefits of implementing ERP in academic affairs.

Keywords: ERP, Role, centralization, consistent, confidential and standardization

1. Introduction
In the world today ERP is being integrated in the educational institutions in order to improve on the efficiency of management in academic affairs. The technologies are perceived to increase connectivity of the institutions and streamline the coordination of the programmes. ERP has very many benefits when applied to management. Goeun, (2013) [8] revealed that the benefits of ERP included; campus wide integration on a common system; improved internal communications; reduced or eliminated manual processes; enhanced strategic decision making and planning capabilities; established a self-service environment for employees; improved self-service environment for students and faculty; enabled higher availability of administrative systems; supported sophisticated data analyses for use in decision-making; integrated workflow, industry best practices, and reduced dependence on paper.

The technical benefits included reduced or eliminated backup or shadow systems platform for re-engineering business practices and continued process improvements; developed and maintained consistent data definitions; provided accessible, user-friendly administrative and student support services; increased data integrity, validity and reliability; assured system wide security and protection of confidential information; created a more seamless integration between technology and education delivery by providing a single platform based on new technologies and accessed data in real time. There is therefore need to conduct this study to establish whether these benefits could be attained when ERP is applied to academic affairs in universities in Kenya that have been facing difficulties in handling large sets of data that pertains to data in admissions, examinations, and other administrative activities in universities. Literature from the Commission of University Education indicated that not all the universities have fully included the use of technology in the management of academic affairs, instead they are still relying on keeping information on paper in files, books and on computers. In order to clarify any management issues they are forced to rely on the personnel in charge. This at times delays the putting together of information from one office to another. There is therefore a need to conduct this study in universities to ascertain whether the integration of ERP in universities academic affairs could improve on the efficient management of academic affairs since it is presumed that.

1.1 The purpose of the study
The purpose of this study was to establish the role of ERP in accessing data in the management of academic affairs in selected public universities in western region of Kenya.

1.2 Objectives of the study
The objective of this study was to:
i) Determine the role of ERP in accessing data in the management of academic affairs in public universities in western region of Kenya.

1.3 Research Question

i) What is the role of ERP in accessing data in the management of academic affairs in public universities in western region of Kenya?

1.4 Hypotheses of the study

The study was guided by the following null hypothesis:

$H_{O1:}$ There is no significant difference in the role of ERP in accessing of data in the management of academic affairs in public universities in western region of Kenya as a result of the using ERP systems.

2. Literature Review

2.1 The role of ERP for data management

The white papers (2010) observed that the role of ERP was to reduce duplication and improve efficiency, but it also eliminates errors, conflicting data, and administrative costs. In addition, the systems requires that entering data is done at once for the most accurate and up-to-date information is availed to front-office and back-office at the same time so as to improve efficiency by reducing the need to redo work due to erroneous information. An integrated system eliminates this type of error. As universities look forward to improve the efficiency of their operations, they are turning to ERP technology for a solution to play the role of providing security on examination data.

2.2.1 Data Confidentiality and Centralization

Pollock, *et al,* (2005) [22] showed that ERP when applied to all aspects of an organization attempt to bring together unrelated functions under the umbrella of one system. One notable aspect of previous university systems was that they were kept within the domain of the centralized administration had little influence on the primary functions of universities and their chalk-face workforce. Wang, *et al,* (2011) [33] reported in a case study that ERP SAP was utilized as an ERP software tool for illustration of the case. The purpose of the study was to provide guidelines for ERP researchers, practitioners and academia to better understand object reuse and integration in ERP systems. Wang (2011) [33] also focused on ERP systems and their centralized data storage and object reuse in large organizations.

The study revealed an illustrated ERP infrastructure and components on 12 application modules of SAP that are used to centralize data in the USA. He indicated that twelve application modules were organized into the four categories in SAP which included modules like Financial Accounting (FI), Controlling (CO), Fixed Asset Management (AM) and Project System (PS).The logistic modules include Sales & Distribution (SD), Material Management (MM), Production Planning (PP), Quality Management (QM) and Plant Maintenance (PM). The Human Resources (HR) module supports human capital management (HCM), payroll and the planning and control of personnel activities. The Common Systems modules include Workflow (WF) and Industry Solutions (IS). WF integrates the functionality of these application modules and centralizes all the information in the specific organizations.

Further each application module in SAP is a collection of a number of related business process procedures (BPPs). Business warehouses provided users with centralized historical data to identify trends, patterns and provide business solutions to decision makers in organizations. For instance Heidelberg composite in German merged with Frankenstein bikes to form global bike incorporation which integrated a shared service services model in a centralized process. The study revealed that unlike other computer applications, ERP has the multi-disciplinary scope of enterprise system concepts that required internal cross-disciplinary coordination, ERP was a set of large and complex database and data warehouse applications that provide the data necessary for the enterprise business processes and all ERP systems are heavily dependent on centralized data repository. Wang further reported that the central repository of information allows authorized users to access the same information in one location using an ERP system. This feature allowed for one version of information to be used. With the central data repository comes the decline of data redundancy. The data was kept in one location where all authorized users had access. Having one central place for the information to be stored reduces the likelihood of human error of not using the correct information for future transactions. This study focused on data centralization from multiple business application and lacked research design, study population, sample size and data collection methods.

Ranganathan and Brown (2006) [23] suggest that the use of a centralized data repository in an ERP system result in an integrated database for multiple functions and business units, providing management with direct access to real-time information at the business process, business division, and enterprise levels. The studies' shortcoming was that, representativeness of the sample was not clear because the total respondents were not indicated and the research design and data collection procedures were lacking.

Carton (2000) focused on attributes related to the implementation of ERP such as centralization and integration attributes and use of information technology control to make information accessible to be understood. Data was collected using interviews with 76 managers from different functions affected by the implementation of ERP. Interviews were carried out using semi-structured format. Observations from transcripts were extracted. The study revealed a strong linear relationship between centralization and integration. That is, the stronger the consensus around the need for a centralizing forces in the organization, the stronger the perceived need among managers for integration. Based on field work involving two multi-national manufacturing companies, this study proposed a framework for ERP integration, which describes the evolution of functionality gaps as an ongoing and inevitable process that requires management. The objective of this research was to propose a framework which would allow the question of integration to be modeled alongside other related organizational attributes. The research objective was operationalized into three separate research questions which together yield a picture of the scope of integration in the organization, and a suggestion for the interdependence between integration and other organizational attributes. In this research, two case studies of successful multinational companies (KPC and SIT) were used to explore the impact of integration on the organization. Both cases studied are multi-national manufacturing organizations with mature ERP implementations.

This research study further included both core operational and support functions, as ERP is inherently an administrative (support function) tool, yet its impact was most felt at the transactional level (operations). The data from interviews regarding ERP impact was classified with respect to organizational parameters, and these parameters had been identified as seed categories from the literature, but other themes also emerged from the analysis of managerial perceptions. The seed categories included themes such as centralization of responsibility, standardization of processes and gaps between template process and reality. Business processes were used to analyze findings as an embedded unit of analysis, in order to better identify areas of the organization where the integration impact was most strongly felt. Interviews with managers from both cases were carried out in the period from April 2005 to August 2005 and involved meetings with 76 managers from different functions affected by the implementation of the ERP system. SIT had gone live on their ERP system in October 2001, so these interviews reflect the views of managers using a relatively mature system. Interviews were carried out using a semi-structured format, and each interview lasted one hour. The interviews were recorded and transcribed, yielding over 400,000 words of raw research material. A robust coding methodology was applied to reduce the data and avoid paralysis by data analysis (Yin 2003).

Observations from the transcripts were extracted to a matrix structured by research question, yielding a total of 3,202 observations. Cell entries were either abridged versions of the original quote, summarized to capture the issue raised. Using hyperlink functionality between Microsoft Excel and Word, each extracted observation was linked back to the original transcript, thereby retaining richness and avoiding "too thin cell entries. These results revealed a strong linear relationship between centralization and integration. This study was interested in multinational manufacturing companies and not academic institutions. Interviews were carried out using semi-structured format that increased the data unreliability.

A study by Pollock (2005) [22] focused on the contribution of ERP in reshaping of universities and how the systems are being reshaped for universities and why universities are adopting ERP. The universities in London wanted to depart from traditional computer systems strategies since ERP translates easily across boundaries. The appropriateness of ERP in higher education was indicated in capturing and integrating the full range of activities and transactions across the organization. The study focused on ERP as a 'generic' and 'global' solution and showed how this presents universities with particular sets of issues regarding the control and shaping of their systems and ultimately their institutional and organizational autonomy. The report is based on an ongoing programme of academic research on the reshaping of universities and the role of Information & Communication Technologies (ICTs) within that reshaping process. The study conducted ethnographic research over a four-year period at a large red-brick university in the UK, and at SAP, the large German ERP supplier, as well as the associated higher education 'user group'. This study lacked the design, target population, sample size and methods of how data was collected and did not specify the re-shaping in the universities with the use of ERP.

Spectrum Tech (2013) [30] reported that Education establishments mainly depend upon technology to manage student data. students reports like admission list, class wise, area wise, profession wise, student address report, ID card, label printing, and admit card printing and that Student information systems provided capabilities for entering student records and other assessment. centralized of information in an institution made student schedules, tracking student attendance, and managing many other student-related data needs in a school accessible and ERP has emerged as crucial aspect of Educational Institute. The product included a Intranet and Web-based suite of applications and some of the sub systems are Administration Management, Student and Staff Information Management System, HR Management, Academic Management, Student and Staff Attendance Management, Library Management, Inventory, Internal Assessment Management, Alumni Management, online dashboard etc. This study again, hardly had information on the nature of data collected and the sample size for the study.

From the reviewed literature, the following gaps were filled. Pollock (2005) [22] focused in the ERP functionalities. Pollock (2005) [22] focused on the contributions of ERP in reshaping universities and how the systems were also being re-shaped and why universities were adopting ERP the study had no clear number of participants and how data collection was done and reshaping with ERP was not clearly specified. Wang *et al* (2011) [33] focused on the provisions of guidelines for ERP researchers, practitioners and academia. Auganathan and Brown (2006) [23] focused on centralized data repository in the ERP system, the studying had no clear procedure for data collection and lacked research design. Carton focused on attributes related to the implementation of ERP such as confidentiality and centralization, used interviews that were semi structured and observation. The study lacked clear sample size and design was conducted on multinational manufacturing companies. The current study filled the gaps by conducting the study on universities and it had a research design, clear methods of data collection and specified the role of ERP in centralization of data for improving efficiencies in academic affairs.

2.2.2 Data Consistency and Standardization

ERP systems have the potential to contribute to standardization and integration of organizational data through an off the shelf solution. In practice results of ERP systems implementation has varied greatly. Considering their implications on business processes and the complexity of the systems this should not come as a surprise. (Holmström, *et al*, (2002) in their study addressed the question of how to make use of Enterprise Resource Planning (ERP) systems in companies in the process industry where there was a pervasive need of process standardization. They reported that ERP systems had the potential to contribute to the standardization and integration of organizational data through an off-the-shelf solution, that the ERP systems implementation had varied greatly and ERP systems not only imply standardization of data but also standardization of key processes in the company.

This study described a case study of the Swedish diary company Norrmejerier and the implementation of the ERP

system IFS analyzed from a perspective of complex system and standardization. The use of IFS at Norrmejerier can be characterized as a loosely coupled integration with the ERP system as a central integration facilitator. This solution allowed the company to make use of standardization benefits, filling the need of special functionality and at the same time limiting the negative unexpected consequences such as decreased activity support and increased complexity. The key contributions of this study was that it showed how ERPs contributed to standardization and integration efforts in IT environments with peculiar demands on functionality. Secondly it demonstrated how negative side effects related to implementation of ERP systems can be managed and limited. This research is based on an interpretive epistemology where people's impression and understanding of their world are at center stage (Walsham, 1995).

The data used in this study was generated by semi-structured interviews conducted with seven persons, two of whom were working in the IT consultancy business, and five at Norrmejerier. Interviews with a limited number of respondents that yielded qualitative data was chosen due to the explorative character of the research question. Further on a relatively small number of persons were judged to possess deeper insight into the research area at the organization in question. This led to the conclusion that the interpretive paradigm, and a deeper examination of the experiences among the key-respondents, would be the approach best fitted to help answer the research question at hand. The selection of respondents was based on specific requirements in different parts of the research project.

In the beginning a basic understanding of the nature of ERP systems and Norrmejerier's business were judged to be important which resulted in interviews with a wide perspective and respondents suited to provide this knowledge. As data and knowledge of the author were generated respondents with more specialized knowledge of systems and processes were chosen. Before the data was generated somewhere between five to ten interviews were judged to be a suitable sample size. As it turned seven interviews were deemed to provide enough material since the relevant new knowledge gained from respondents was dramatically decreasing. The interviews lasted between 30 minutes and one and a half hour and where performed at the respondents' workplace. All but one that provided deeper understanding of the issues but not directly relevant material for the study of them where later fully transcribed in order to enable a broad analysis of the impact of the systems and minimizing the risk of neglecting relevant information. In the analysis phase the transcribed material was read through at least two times and then divided into four different categories; standardization, integration, effects on processes and the ERP infrastructure.

The case study described how an ERP system was used as a platform that provided integration and standardization of data and processes, rather than a fully integrated IT solution. Hereby the system played an infrastructural role, enabling other more specialized systems to use standardized and quality secured data while they provide the needed functionality. The ERP system thus contributed to data quality improvement, integration, and a process-based mind set in the company. At the same time negative side effects seems to have been limited. Apre-requisite when creating this solution was the modular structure of the ERP system that allowed a less complex system and hereby reduced possible side effects. This study illuminated the importance of reducing ERP structure complexity and the importance of modularity when struggling to achieve this. While the modular architecture at Norrmejerier satisfied functional demands for the organization, negative organizational side effects typically associated with ERP use were also limited. Moreover, the ways in which Norrmejerier's system played a role in the standardization of processes throughout the firm had a pervasive effect on the organization and its performance. Implementing the ERP system was not only an issue of IT; it was also about implementing processes. More than anything else the modular architecture helped to limit the side-effects of the technology as the modularity enabled Norrmejerier to act in order to contain undesired side-effects. The main contribution of the paper is that it provides an example of what seems to be a successful implementation of the ideas of Hanseth *et al*, (2006) on limiting the scope of standards to stable and universal areas. Applying this thought on ERP systems seems to be one way to decrease complexity related problems, decrease the risk of reflexivity issues and away to make use of ERP systems despite organizational process deviations from the model this study. However the number of respondents in this study was not made explicit beforehand. Instead the aim was to gather enough data in order to be able to make a relevant comparison in respect to the research question.

One limitation of the data set is that none of the respondents from Norrmejerier worked directly with the production process, the reason being a focus of the research on organizational effects rather than on user centered ones even though a clear distinction between the two of course is hard to make and practical limitations. This might have the effect that perceived disadvantages in the form of system rigidity and limitations imposed on users is not as clearly stated as they would be otherwise. As mentioned the study however focused on organizational impacts and on this level these problems does not seem to have been a major issue. This study was conducted on the Swedish diary company Norrmejerier as a case study that could have restricted data collection and the number of participants was low. The study also used only interviews as a method of data collection that could biases in their conclusion.

A study has reported that the ERP infrastructures are made up of standardized interfaces and standards constitute a condition for infrastructures rather than bilateral arrangements (Ciborra *et al*, (2000) [3] and hence creating infrastructures is never done in a vacuum, in some way they are always linked to what already exists, the installed base. The installed base implies that infrastructure is not something that can be easily changed in a radical way. The installed base has to be formed or linked to the new infrastructures and actors wanting to make use of it (Davenport 1998, Hanseth *et al*, (2001) [6, 9].

Further still the studies revealed that ERP systems functionality and organizations were able to integrate all functional units, standardize and manage information sharing within their entire departments and then extended it to suppliers and customers in order for suppliers to expedite the

delivery of necessary raw materials and also in order for customers to place an order faster and smoother. For example, Turban *et al,* (2008) [31] reported that Northern Digital Inc. implemented ERP system from Intuitive Manufacturing Systems which provided a level of ERP system functionality that could immediately improve inventory management, expandability of entire system, and flexibility in the whole supply chain in order to support the company in current competitive business environment. These studies concentrated on the functionalities of ERP systems in the business enterprise and lacked the sample size, design and did not specify the role of ERP in the business enterprise.

The white paper (2000) reported that standardizing and automating business processes locally as well as across multiple locations and countries was done to accelerate business operations. This offering a fully integrated suite of business management applications that share a common dataset and extending these applications over the Internet, allowing visibility and collaboration across departments, as well as with customers, partners, suppliers, and remote users. ERP solutions improve efficiency by automating business processes, furnishing integrated applications that share data to give employees instant access to the information they need, and by providing business intelligence and analytics to improve decisions and planning. The Standardized processes accelerated operations manual processes that was considered to be tedious and time-consuming, and employees could easily miss vital steps or provide customers with an inconsistent experience and that why, according to Aberdeen, the majority of "best-in-class" companies (54%) were looking forward to use ERP solutions to standardize and accelerate business processes. Additionally the study reported that ERP solutions standardize and accelerate processes through automation, which ensures that processes are performed efficiently and correctly. Alerts warn managers of exceptions so they can address any issues proactively. This study did not inform on what standardizing the processes using ERP did to make it efficient but dealt with its functionalities and it focused on business processes and not academics.

Rico (2000) in his survey on ERP in institution of higher learning especially in the university of Wisconsin-superior and Wisconsin technical college focused on technical details of adopting and integrating ERP solution into university environment. The study examined the top reasons for universities that included replacing of legacy systems, improving customer service, transforming enterprise processes, modernize computer systems, improve administration and increase operating efficiency. The study revealed that the top reasons why universities adopt ERP solutions were to replace legacy systems, improve customer service, transform enterprise processes, correct year 2000 problems, modernize computer systems, improve administration, maintain competitiveness, increase operating efficiency, and adhere to regulatory compliance. Serving its primary purpose was three in depth case studies of ERP implementations in a small, medium, and large university. In particular, it examines ERP at the University of Wisconsin-Superior, the University of Massachusetts, and the Wisconsin Technical College System.

What was learned from these case studies was that ERP implementation served several primary purposes with the objectives of replace expensive custom systems with off the shelf solutions, exploit the accessibility advantage of the Internet, and integrate and automate a single standardized solution. The cases focused on the technical details of adapting and integrating ERP solutions into the university environment. Little attention was placed on strategic planning, organizational culture, and use of disciplined project management principles.

King, Kvavik, & Voloudakis, (2002) [14] studies reported that the benefits of ERP solutions were that an ERP project was good for one's career; the new systems offered improved services for faculty, staff, and students; administrative, academic and student data are standardized; university data is globally accessible over the Internet; and the new systems involve less cost and risk than legacy systems (Kvavik, Katz, Beecher, Caruso, King, Voludakis, & Williams, 2002) [14]. These studies did not examine the specific areas of implementation and the efficiency of ERP in academics especially standardizing data. The current study considered standardizing data as one of the roles of implementing ERP in managing academics in universities.

Shang and Seddon (2000) [29] reported that ERP assisted universities to achieve a variety of benefits such as reduced operating costs, accurate demand forecasts, managers improved decision making and better resource management, greater support for alliances, building innovations and cost leadership, IT infrastructure, building business flexibility, reducing ICT costs and organizational benefits, supporting organizational change, facilitating business learning and empowerment. This study did not consider the benefit of ERP in bringing standardization across a variety of organizational functions of which the current study filled the gap.

Following the information from reviewed literature, the following gaps were identified. Holmstrom *et al,* (2002) [26] conducted the study on Norrmejeries dairy company in Sweden and focused on the use of ERP for standardization however the number of respondent was not explicit and none of them was from of Norrmejeries dairy company and focused on organizational impacts. Ciborra *et al,* (2000) [3], Davenport (1998) [6] and then seth *et al,* (2001) [9] concentrated on the functionalities of ERP Systems in business enterprise and not how ERP provided the safety of the data, the studies had unspecified participants and no procedure of low data was collected. The White paper (2000) findings indicated that ERP standardized and automated business across multi locations and countries. no clear way in which data was obtained Rico (2000) focused on technical effects of adopting and integrating ERP solutions, ng, Kvavik & voloudakis (2002) [14] indicated that ERP was good for career and its standardized data but this study did not have specific areas of implementation and efficiency in academics. The gaps were filled by the current study that greatly emphasized the role of ERP in standardizing data.

3. Methodology

3.1 Data Collection

To achieve the objectives of the study the researcher used the following instrument to collect data. Questionnaires, interview schedules and content analysis.

4. Findings

4.1 The role of ERP and data management in academic affairs in universities

The study was to establish the role of ERP in data management in academic affairs in universities in western region of Kenya. The respondents were to investigate the role of ERP, extent of using ERP to access student's data and its efficiency. The null hypothesis that there is no significant difference in the accessing of data in the management of academic affairs in public universities in western region of Kenya as a result of using ERP was also tested.

Table 4.5: The Implementation of ERP and the provision of security for examination data in the management of academic affairs in universities

Roles	S	Ns	m	S D	X^2	df	sig
Standard	87.5	12.5	1.13	0.34	0.327	1	0.568
Consistent	87.512	512	1.13	0.34	0.327	1	0.568
Confidential	75	25	1.13	0.34	0.372	1	0.568
Centralize	81.2	18.8	1.00	0.00	0.572	1	0.468

Key: S=Secured, NS= Not Secured

Findings from the table showed that 14(87.5%) of the DVCs and Registrars agreed that ERP standardized and maintains consistent data, However 2(12.5%) of the respondents disagreed that ERP standardizes and maintains consistent data. This could be due to the lack of the implementation of ERP in the academic affairs in some of the universities in the study. The findings in the study means that majority of the academic staff agreed that ERP standardizes, centralizes and maintains consistent and confidential data. The findings in table also indicated that the perception of the DVCs and Registrars showed that there was a relationship between the implementation of ERP and the provision of safety mechanism on examination data in the management of academic affairs in universities therefore the null hypothesis was rejected. Further the Deans and Cods were to establish whether the implementation of ERP provided safety mechanisms for examination data their perceptions are presented in table 4.6.

Table 4.6: The Implementation of ERP and provision of security for examination data in the management of academic affairs in universities

Roles	S	NS	M	SD	X^2	df	Sig
Standard	90.2	9.8	1.24	0.43	0.356	1	0.551
Consistent	84.3	15.7	1.04	0.20	1.162	1	0.281
Confidential	84.3	15	1.07	0.25	1.894	1	0.169
Centralize	76.4	23.6	1.04	0.20	0.468	1	0.180

Key: S=Secured, NS= Not Secured

Findings from table 92(90.2%) and 86(84.3%) of the Deans and CODs agreed the ERP standardized and maintained consistent and confidential data respectively. However 10(9.8%), 16(15.7%) of the respondents and 16(19.8%) of them indicated that ERP did not secure data by standardizing and maintaining consistent data. This could be due to the lack of the implementation of ERP in academic affairs in some of the universities under study or incompetency on the part of the users. The findings in the study means that majority of the academic staff agreed that ERP standardized, centralized and maintained consistent and confidential data. The perception of the Deans and CODs that there is no significant relationship between implementation of ERP and provision of safety mechanism on examination data in academic affairs management was rejected ($p>0.05$). For the characteristics whose association was significant, the extent of relationship was low. The lecturers' views were also sought on the provision of safety mechanisms on examination data and the findings are presented in table 4.7.

Table 4.7: The Implementation of ERP and provision of security for examination data in the management of academic affairs in universities

Roles	S	NS	M	SD	X^2	Df	Sig
Standard	43.4	56.6	1.14	0.35	6.552	1	0.010
Consistent	55.6	44.4	1.03	0.17	5.810	1	0.016
Confidential	63.6	36.4	1.06	0.24	0.01	1	0.914
Centralize	64.6	34.4	1.02	0.13	0.260	1	0.120

Key: S=Secured, NS= Not Secured

Findings from the table showed that 192(64.6%) and 189(63.6%) of the lecturers agreed that ERP standardized and centralized data. However 108(36.4%) of the respondents disagreed that ERP standardized and maintained consistent data. This could be due to minimal implementation of ERP in academic affairs in some of the universities under the study. The findings in the study mean that averagely the respondents agreed that ERP standardized centralized and maintained consistent and confidential data. The findings in Table 4.24 indicated that there was a relationship and variations in the implementation of ERP and the provision of safety mechanism of examination data in the management of academic affairs in universities. The perception of Lecturers that there is no significant relationship between implementation of ERP and safety mechanism of examination data management of academic affairs in universities was rejected ($p>0.05$) in all the reasons of providing safety mechanism of examination data in academic affairs. For the characteristics whose association was significant, the extent of relationship was low. This therefore means that the null hypothesis that there is no significant relationship between implementation of ERP and efficiency in the management of academic affairs among the lecturers was rejected. This could be attributed to engagement of lecturers in servicing on ERP system. The interviews showed that ERP in servicing had reached the level of Deans and CODs and the lecturers. Most of the interviewed IT personnel indicated that the universities strategic vision was to improve operational efficiencies and exchange information to maintain a competitive edge and quality of education offered and therefore automating the examination processes using ERP made work easier and more secured.

The findings of the current study on the role of ERP agreed with Pollock (2005) [22]. The similarity was in the application of ERP that brought together unrelated functions under the umbrella of one system. The difference was that it focused on the contribution of ERP in re-shaping universities and not providing security o examination data. The findings of this

study were similar with those of that were reported by Penver (2012) [20] that functionalities of oracle gave complete security to data that allowed the encryption of data and protected both the data in the operational database and the data from backups as it transits the network. Oracle Advanced Security doesn't need any additional configuration at the application level and provides a transparent encryption of all sensible system data it integrates management of encryption keys, transparent encryption of sensitive columns and transparent encryption of the entire table space and hardware security module integration.

The findings of the current study also agreed with those of Wang (2011) [33] that focused on ERP systems and their centralized data storage and object reuse in large organizations. The study revealed that an illustrated ERP infrastructure and components on 12 application modules of SAP were used to centralized data in the USA and that ERP had a strong linear relationship with data centralization. It also indicated that twelve application modules were organized into the four categories in SAP. ERP systems functionality and organizations were able to integrate all functional units, standardize and manage information sharing within their entire departments and then extended it to suppliers and customers in order for suppliers to expedite the delivery of necessary raw materials and also in order for customers to place an order faster and smoother.

The findings of the current study agreed with those of Carton (2000) which had the attributes of centralization and standardization at the core of the implementation of ERP. However the current study dealt with the role of ERP in providing data security in public universities while the reviewed study covered centralization of data in corporate organizations in German. Some of the respondents in the current study also said that ERP ensured confidentiality and consistency of data. This agreed with the findings of Holmstrom (2002) [26] which revealed that ERP played an infrastructural role of ensuring confidential and consistent data. The findings of the current study showed that the role of ERP in the provision of security to data was in data confidentiality and consistency. This observation concurred with white paper (2000) which reported that ERP provided confidential and consistent data. Similarly Rico (2000) showed that universities of Wisconsin-superior and Massachusetts and Wisconsin technical college adopted and integrated ERP to replace the legacy systems to ensure data standardization as a way of increasing operation efficiency in the university environment.

The findings of the current study on ERP use to access data agreed to some extent with those Rico (2000). The similarity was in large and voluminous data on admission and programmes offered of large number of students to be accessed propelled the universities to implement ERP in academic affairs to enable ease access of students' data. The difference was in the location and environment where the universities were found. The current study dealt with public universities in Kenya while the reviewed study covered universities in the USA.

Again the findings of the current study showed that majority of the respondents perceived that ERP implementation enabled access of students' data to a larger extent. Similarly Hitt (2002) [11] revealed that ERP implementation in California state university that had 23 compuses served 400000 students in accessing data on admission, finance and students records. Again Saide (2010) [25] showed that universities in Kenya that had integrated ERP systems were able to capture and access data on students' finance and examinations because the systems had less human error.

Study findings on the responses after applying ERP in the current study indicated that majority of the respondents were positive in the use of ERP. This observation concurred with Finger (2001) which showed a positive perception towards the integration of ERP systems in management. The respondents realized that ERP was a powerful instrument when integrated in management of the ICT industry and telecommunication industry in S.A. the current study showed that the use of ERP had minimal negative responses. This observation also concurred with Otieno (2000) that companies that had integrated ERP were completely positive with the upgrading of ERP systems that had increased income and services.

Again the findings of the current study on the responses after using ERP were similar to those reported by Kajuna (2009) [13] which indicated that despite the impediments that affected the effectiveness of ICTs in the University of Dar es salaam the respondents were positive in their attitude and they made effort to realize the implementation of ICTs. Also the findings concurred with Otieno (2000) who established that the various companies in Kenya that had integrated ERP were completely positive due to the upgrading that increased incomes and services.

5. Summary, conclusion and recommendations

5.1 ERP use and access of students' data in the management of academic affairs

Majority of the respondents were able to use ERP in accessing students' data on admission, finance, progress reports and examination results while a few of the academic staff were not able to access the data on students. Most of the academic staff members were positive in using ERP to access students' data. The DVCs and Registrars suggested that ERP was used to access students data on admission, finance, and progress report and examination results. The majority of the Deans and CODs had a varied outcome where they agreed that ERP was able to access data on student admission while the Lecturers had a varied outcome where they agreed the ERP could only access data on finances for the students.

5.2 The role of ERP in accessing data in the management of academic affairs

The study found out that many of the respondents perceived the role of ERP as having improved data management in various areas of academic affairs. ERP centralized and standardized data and produced consistent and maintained confidential data. The study found out that ERP provided security to examination data. Data was standardized, consistent, confidential and centralized. The study concluded that ERP systems contributed to improved data management as compared to the management information systems because ERP IS advanced in standardizing and centralizing data. This had impact on enhancing efficiency in the management of academic affairs in universities. It was concluded that ERP

has the highest ability of providing security to examination data in universities.

5.3 Recommendations

From the conclusions the following were the recommendations for the study.

5.4 The role of ERP in accessing data in the management of academic affairs

1. The university academic staff members are encouraged to embrace the use of ERP systems to improve on timely data management of examination processes.
2. The university academic staff members are encouraged to demystify the complexities of using ERP in order to reap the benefits of implementing ERP in academic affairs.

6. References

1. Brown E. The best software business Bill Gates doesn't own. Fortune. Budget cuts. University Business, 1997.
2. Carton F, Adam F. Towards a Model for Determining the Scope of ICT Integration in the Enterprise: the Case of Enterprise Resource Planning (ERP) Systems university College Cork, Ireland, 2001.
3. Ciborra TM. ERP's Second Wave. Tech. rept. Deloitte Consulting, New York, NY, 2000.
4. Cohen L, Manion L, Morrison K. Research methods in education. London: Rutledge, 2000.
5. Creswell WJ. Qualitative, Quantitative and Mixed Methods Approaches. 4th ed. university of Nebraska-Lincoln. Washington DC, 2014.
6. Davenport TH. Putting the enterprise into the enterprise system, Harvard Business Review. 1998; 8:25.
7. Finger G. An Investigation into the Implementation of Enterprise Resource Planning by SA ICT Operators Development Bank of Southern Africa, 2002.
8. Goeun S. Challenges in Implementing Enterprise Resource Planning (ERP) system in Large organizations: Similarities and Differences between Corporate and university Environment Sloan School of Management, Massachusetts Institute of technology Cambridge, 2013, MA 02142.
9. Hanseth G, Korin A. What are ERP Systems?. By, graduate School of business, stan- ford University, and Stanford, CA, 2001.
10. Heeks RB, Kenny C. ICTs and development, S., & Krishna, S. (eds), ICTs and Development, Proceedings of IFIP WG9.4Conference, 2002.
11. Hitt LM, Wu DJ, Zhou X. Investment in enterprise resource planning: business impact and productivity measures. Journal of Management Information system, 2002.
12. Holmstrom LT. The social dynamics of software development: accounting, management and Information technologies, (implementation, Wiley series in information systems, 2002.
13. Kajuna WL. Implementation of technology integration in higher education: a Case Study of the University of Dare S Salaam. Ohio University, 2009.
14. King P, Kvavik RB, Voloudakis J. Enterprise Resource planning System in Higher (ERB0222). Boulder, CO: EDUCAUSE Center for Applied research (ECAR), 2002.
15. Kothari CR. Research Methodology: Methods and Techniques. 2nd Ed. New Delhi: New Age International Ltd, 2004.
16. Kvavik RB, Katz RN, Beecher K, King P, Voludakis J, Williams LA. The Promise and performance of enterprise systems for higher education (ERS0204). Boulder, CO: Educause Center for Applied Research (ECAR), 2002.
17. Mugenda OM, Mugenda AG. Research Methods: Quantitative and Qaulitative Approaches. Nairobi: Acts Press, 2003.
18. Otieno J. Enterprise Resource Planning (ERP) Systems Implementation Challenges, 2008.
19. A Kenyan Case Study. (ed), Lecture Notes in Business information Processing, 7.
20. Penver A. Oracle E-Business Suite R12 Core Development and Extension cookbook Packet Publishing, 2012.
21. Pollock N, Cornford J. ERP systems and the university as a unique organization. Information Technology & People, 2004.
22. Pollock N, Cornford J. Implications of Enterprise Resource Planning Systems for Universities: An analysis of Benefits and Risks, 2005.
23. Ranganathan C, Brown CV. ERP Investments and the Market Value of Firms. Toward an Understanding of Influential ERP Project Variables, Information Systems Research, 2006.
24. Rico DF. ERP in Higher Education. Retrieved on 5th October, 2010-2012, from: http://davidfrico. com/rico04f.pdf
25. Saide M, Ruforum F. The use of ICT at Kenyatta University. Partnership for Higher Education in Africa, 2010.
26. Holmstrom H. ERP fully integrated or transactional? Norrmejerier. Sweden, 2002.
27. Sethet J. Collaborative Framework for the Implementation of Integrated ICT University, 2008.
28. Systems: The Strathmore University Experience-The Elimu Project. Nairobi: Strathmore Research and Consultancy centre. Organization Development Journal, 28(2),
29. Shan KS, Seddon PB. Assessing and managing the benefits of enterprise systems: The Business manager's perspective. Information Systems Journal, 2002.
30. Spectrum D. Reengineering the university. Communications of the ACM, 2013.
31. Turban E, Leidner D, McLean E, Wetherbe J. Information Technology for management. Transforming Organizations in the Digital Economy. Wiley Sixth Edition, 2008.
32. Voludakis S. Essential Characteristics Of An ERP System: Conceptualization and Operationalization, University Of Québec, Canada, 2002.
33. Wang M. Object data reuse and integration in ERP. California state university. Issues in information systems, 2011.
34. White Paper. Security Recommendation for Cloud Computing provider, 2000.