



Optimization of Management Information System on Delivery of Services

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Abstract The study Optimized Management Information System on delivery of Services in Higher Institution of Learning. MIS is a factor of research, a matter to ponder; poor management information system has been identified as a bottleneck in the successful management of universities in Rwanda. Research was done at the University of Kigali, Laboratories; Objectives were: -to examine the effect of System Customizations, assess the influence of computer processing speed and analyze the level of IT Infrastructure on delivery of Services. Data was analyzed by Regression analysis technique. Findings indicate that System Customization had a statistical significance on delivery of Services were t-value (2.84) and p (0.03) hence < 0.05 , according to rule of thumb, it is optimum, though weak, t-value of system processing speed (t-4.620) while P (0.000), this was significant and level of IT Infrastructure had a weak statistical significance on delivery of Services were t-value (2.04), higher than 1.96 and p (0.05). Conclusion shows that System Customizations, System processing speed and the level of IT Infrastructure are among the factors influencing the delivery of Services, however findings indicate that System Customizations and Level of IT Infrastructure portray a low performance, there need to consider strong Computer components, suitable equipments to boost IT Infrastructure. System Customizations calls upon baseline need assessment-narrowing down to application software needs. A boost on System Customizations is paramount; more effort is required on equipping IT Infrastructure both Hardware and software. Baseline need assessment will be key. Future studies to consider narrowing down to application software needs. We recommend wide sample size.

Keywords System Customizations and Delone & Mclean, Delivery of Services

Introduction

Delivery of Services is a challenge for many higher institutions of learning in East Africa region. Unlike in developed countries, such as: USA, Australia, China and European countries where systems at higher institution of Learning are processing at high speed, the education sector is experiencing a challenge on delivery of Services [1]. This is a handicap for university delivery of services, laps on institution productivity and growth. Research indicate that a number of institution are losing profit due to poor performance of its systems., number of Universities in East Africa are facing issues in terms of poor delivery of services- due poor Internet connectivity , Such is caused by scarcity of computer infrastructure. The Governments in East Africa have so far tried to implement Integrated System, which are Customizations by a number of public Sectors including public universities (such include; ERP, IFMIS, MIS, HIFMS) a number of such systems have been witnessed in Most of Kenyan private and Public Universities.



Research indicate that some isolated University Campuses in Rwanda have implemented Computer systems to teller delivery of services .This research established that University of Kigali has implemented an Online Management Information System; the system manages students marks uploads, downloads, Lecturer timetable mapping, administrative operations are also done by the system and other Logistic. Research indicates that Uganda-Public Institutions have gone a step to implement such systems [2].

Study Overview

This paper provides a Management Information System introduction, its application is well explained, the paper draws the problem of MIS in application in higher institution of Learning.MIS has been tackled in the broader way. The study has expressed an Understanding on the broader MIS its relationship to Higher Institution of Learning inputs, processes, outputs and outcomes have been essentially expressed to service delivery. The paper goes ahead to express research hypothesis with special consideration on four major constructs; System Customizations, computer processing speed, Management skills and analyze the level of IT Infrastructure on delivery of Services. It has examined and elaborated architecture, standards on Router access points; firewall and DMZ for system protection. The methodology of the study is based on research design (descriptive), data collection tools have been employed for primary data collection. Data was analyzed by regression analysis technique and Probability values; rule of Thumb is well accorded in the study. Findings have been shown, discussed and explained, finally, the paper describes pertinent service delivery of MIS. Conclusion for the study is based on four major variables. Recommendation has been addressed to provide future research progress.

Background

The information system stores documents and revision histories, communication records and operational data. The trick to exploiting this recording capability is organizing the data and using the system to process and present it as useful historical information. Manager can use such information to prepare cost estimates and forecasts and to analyze how manager actions affected the key company indicators [2]. The author postulates that the MIS has attracted increasing attention among both academics and practitioners globally during last decades. In developed countries, the increasing interest in this field is related to the liberalization of the money market, technological progress, and internationalization of businesses and proper financial management particularly in the public service [4]. These changes have forced management to critically review Information System strategy and, consequently, also learning management policies and responsibilities. These factors have created additional demand for various kinds of systems by use of Information System [4]. According to [3], a number of developing countries such as Peru, Mexico, Pakistan have proven their skills in IT and are using these skills to build on ICT for Development (ICT4D) projects that taps local potential which is a key indigenous partner in the growth of the higher institution of Learning due to delivery of services by MIS. The balance of trade for these nations due to imports in both hardware and software might be an additional consideration [1, 4].

As [5] mention, technologies are simultaneously social and physical artifacts, and have not been realized by a number of scholars, hence, the code phrase “the social construction of technology” which refers to the role of human agency in technological change. From the implementation point of view, designers incorporate into technical systems assumptions about usage by end-users, physical, considerations, technical operation skills, management skills, Capacity of IT Infrastructure (COITI), design traditions, as well as taken-for granted views of the world for which the system is meant to provide solutions. From the usage point of view, users can shape the implications of technology as they incorporate it into everyday practices, using it in intended and unintended ways [5]. Terms the enacted structures of technology use as technologies-in-practice, which she defines it as the set of rules and resources that are constituted and reconstituted in the recurrent engagement of people with the given technologies, that involve delivery of services by MIS to Universities.

The introduction of the Information System has been premised on the realization that Government of Kenya (GoK) can effectively leverage existing and emerging technology to enhance the pace of reforms and management of cash [6] assembled support for modern system automation. A person responsible for the management function is primarily concerned with short-term operation activities, it is more important to know



how to improve the company position, including managing accounts receivable, improving cash flow, transferring funds, and controlling cash disbursements. It is therefore necessary to assess the effect of Financial Management Systems on the principles of use in Higher Institution of Learning [8].

Study by [9] conducted a study on the public sector management information systems, UK. Management information systems (MIS) are fundamental for public sector organizations seeking to support the work of managers. Yet they are often ignored in the rush to focus on 'sexier' applications. This study aims to redress the balance by providing a detailed analysis of public sector MIS [10]. It firstly locates MIS within the broader management monitoring and control systems that they support. Understanding the broader systems and the relationship to public sector inputs, processes, outputs and outcomes is essential to understanding MIS.

The paper details the different types of reports that MIS produce, and uses this as the basis for an MIS model and a description of the decision-making benefits that computerized MIS can bring. Finally, the paper describes generic public sector MIS that address internal government transactions, public administration/regulation, and public service delivery. Real-world examples of all types are provided from the US, UK, Africa, and Asia. [8, 9] conducted a study on the role of management information systems in measuring organizational performance in the KwaZulu-Natal Department of Arts & Culture.

H01: System Customization has no statistical effect on delivery of Services.

H02: There is no significant effect of computer processing speed on delivery of Services.

H03: Level of IT Infrastructure has no statistical influence on delivery of Services.

H04: Management skill has no statically effect on delivery of Services.

System Security Architecture

In the figure below the architecture is called screened subnet mounted with firewalls. Basically the routers mounted the External gateway and the Internal forms the access points, practically filters signal entry on the network. The Demilitarized zone consists of two or more internal bastion hosts behind packet filtering router, with such host literary protects trusted network on their entry .As expressed on the figure below ,its Connected from outside (which indicates untrusted network) routed through external filtering router. The other Filtering internal router is Connections from outside (which known as the untrusted network), such are routed into and out of routing firewall to separate network segment known, called the Demilitarized Zone(DMZ) .Connections into trusted internal network. Screened subnet performs two functions. Protects DMZ systems and information from outside threats. It protects the internal networks by limiting how external connections can gain access to internal systems

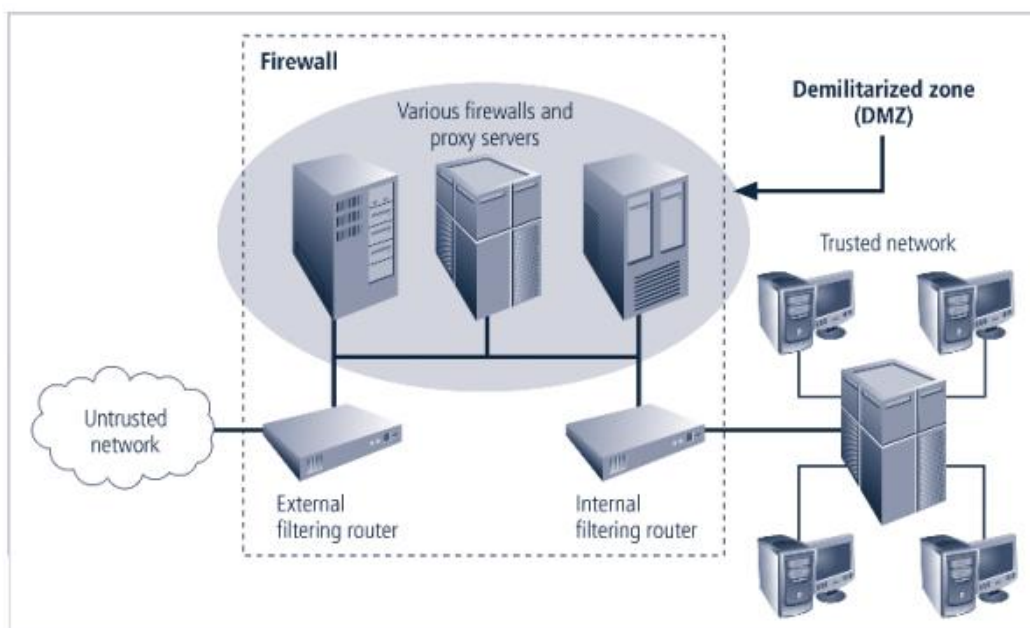


Figure 2: Source: Sanja et al., (2014), European Journal of Engineering and Technology



The protection of the Information system is achieved by the best Practices on Firewalls, as shown in diagram above : All traffic from trusted network is allowed out towards the MIS , Firewall device is never directly accessed from public Network, Simple Mail Transport Protocol (SMTP) data allowed to pass through firewall, Internet Control Message Protocol (ICMP) data denied, Telnet access to internal servers should be blocked, When Web services offered outside firewall, HTTP traffic, should be denied from reaching internal networks

Mis, Demilitarized Zones & Firewalls

The public service should tailor information concerning IS in such a way that it cannot be tampered with hence there should be sufficient IS controls to curb tampering of the system for example: Hacking, Cracking, Snooping, Man in Middle operations also making sure the proxy servers all over the country are often placed in secured areas of the network such as inside Demilitarized Zones, avoiding the exposure to higher levels of risk from less trusted networks" Connections from outside (entrusted network) should be routed into and out of routing firewall to separate network segment be inside (Demilitarized Zones) to be Installed through DMZ bastion host servers (Figure 2).

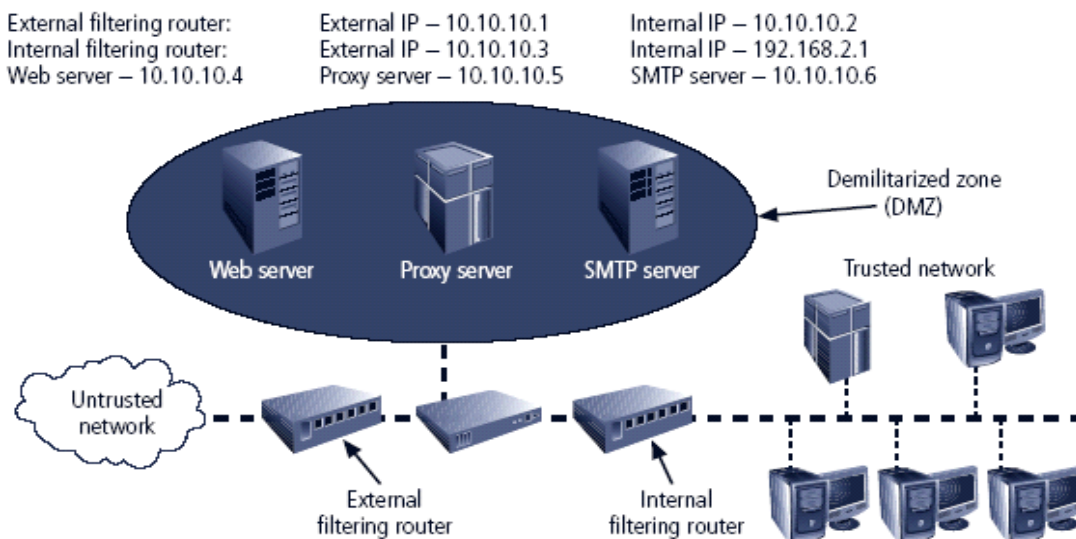


Figure 2: Source: Sanja et al., (2014), European Journal of Engineering and Technology

Delivery of Services by Systems

Financial Accounting: For many years, financial accounting has been considered a formal and a widespread source of information within organizations as put by [8]. According to standards in place and accounting protocol, financial accounting provides a representation of the financial situation of companies. This representation is communicated through financial statements at the end of each accounting period also known as the financial year and in accordance with legal requirements and tax regulations. Accounting is an IS that identifies records, communicates the economic events of an organization to interested United Nations Conference Centre, [9].

This study argues that cash management has attracted increasing attention among both academics and practitioners during the last decades [2, 10]. Though research by [11] shows that in developed countries, the increasing interest in this field is related to the liberalization of the money market, technological progress, and internationalization of businesses and proper financial management particularly in the public sector.

Information Systems: The History of Information Systems as a subject of study spans six decades. Information Systems is among disciplines with tremendous development [10, 11]. The Internet, the Local Area Networks within enterprises as well as Wide Area Networks signify great developments and connect multinational corporations all over the world. By the mid-1960s [11], IS had found its way into the business mainstream. At



that time, some business schools began to develop Management Information System (MIS) programs to meet the perceived growing needs of Information Systems managers [12].

Management Information System: According to [13], the concept of MIS was first used in 1965 in the management department of Minnesota University. By the 1970s, these pre-defined management reports were not sufficient to meet many of the decision-making needs of management. To satisfy such needs, the concept of Decision Support Systems (DSS) was born [7, 8, 13]. It was, soon adopted by many management academic centers as a modern scientific attitude. Unfortunately, MIS did not progress as expected while communication and Information Technology (IT) has changed and transformed a lot during a period of fewer than 20 years [14]. Until the 1960s, the role of most IS was simple. They were mainly used for Electronic Data Processing (EDP) whose purposes were the transactions processing, record-keeping, automatic data processing, or information processing and accounting [15].

Processing of data into useful informative reports was a new role added to the use of computers. According to [12], the concept of MIS was born. The new role of MIS focused on developing business applications that provided managerial end users with predefined management reports that would give managers the information they needed for decision-making purposes [11, 12, 14]. MIS was designed for organizational and managerial applications. MIS deals with planning for management development and using IT tools to help individuals implement all functions and performances concerning information processing and management [16]. The author in this study assembled support for MIS, arguing that a system that receives data from different units and produces information and provides managers in all levels with relative, just-in-time, precise and uniform information for decision-making [15].

According to, a computer system improves every organization's just-in-time use, management and processing of data and information. MIS is composed of three concepts: "management," "information" and "system." The main objective of MIS is to present cognitions and solutions to conduct required scientific principles and techniques for management student s, managers and decision-makers of the society to design, apply and manage automatic IS in organizations and management section. Research shows that many specialists and experts show that new role of MIS is to provide managerial end users an interactive support of their decision-making processes [15, 16].

Delivery of Services

Study by [22] content that to measure the delivery of Services you should execute load testing which is aimed to verify that the system's work on computer processing speed on delivery of Services [20]. During Level of IT Infrastructure testing on delivery of Services, the system is exposed to extreme loads and you should check the system's behavior under such loading. Stability testing is conducted to verify the system's work under the average load. Similar research was done by [22], but his findings were based on technology innovativeness. This study argued found out that associated with technology innovativeness. A management information system (MIS) is a computerized database of financial information organized and programmed in such a way that it produces regular reports on operations for every level of management in a company [23]. The system of Management Information System shows that communication is needed to carry out the managerial functions and for linking the organizations with its external environment. Management Information System provides communication link that makes the activities and responsibilities surrounding management or managers possible [23, 24].

The focus in Management Information System coupled with improved processing as led to the reduction in bottlenecks attached to management process. Managers have re-organized for years so that traditional accounting information aimed at the calculation of profit have been of limited value for control. Yet in many companies, this has been virtually the only regular collected and analyzed type of data. Managers need all kinds of non accounting information about the external environment such as social, economic, political, and technical development [25].

In addition, managers need non accounting information on internal operations. The information should be quantitative. Management information system use formalized procedures to provide management at all levels in all functions with appropriate information based on the data from both internal and external sources to enable



them to make timely and effective decision for planning, directing and controlling the activities for which they are responsible. An effective management information system typically employs computer and other sophisticated technology to process information that reflects the day to day operations of the company

Research Methodology

This research employed a type of a design known as Cross sectional design, which is an approach, handling or investigating the state of research issues in a specific type of a population cluster at any given time. Here the types of elements in a sample survey were selected randomly to make inferences at the population as a whole. The study employed secondary data adopted from University of Kigali, Laboratories, in Rwanda; we utilized data set from Lab2, Lab3 and Lab4, and Lab5 to obtain data set.

Data Analysis, Presentation and Discussion

This research used a descriptive research design is best method for collecting original data for the purpose of describing phenomena in population by focusing on certain focused group. The research relied on the use of questionnaires with most closed ended items designed in a likert scale. The constructs were analyzed by regression techniques on: computer-processing speed, level of IT Infrastructure, finally management skills on delivery of Services. ANOVA test was used to determine the level of significance of the relationship between independent variables and dependent variable. Hypothesis was test at 5% significant level. The following general multiple regression model bellow was used in the study.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where

Y = delivery of Services

α = constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Régression coefficients.

X_1 = System Customizations

X_2 = Computer processing speed

X_3 = Level of IT Infrastructure

X_4 = Management skills.

ε = Error

Table 1: ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.288	4	2.322	34.324	0.000 ^b
	Residual	1.827	27	0.068		
	Total	11.115	31			

^aDependent Variable: System_Performance

^bPredictors: (Constant), ManagementSkills, Computer Processing Speed, Facilitating_Conditions, LevelOfITInfrastructure

Results in table has highlights a test by ANOVA and show that $p = 0.000$ mean the dependent variables are significant to the dependent value which system perform.

Hypothesis Testing

Table 2: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
1 (Constant)	-0.609	0.261		-2.331	0.027
Facilitating_Conditions	1.101	0.112	0.798	9.849	0.000
ComputerProcessingSpeed	0.395	0.085	0.371	4.620	0.000
LevelOfITInfrastructure	0.685	0.305	0.792	2.248	0.033
ManagementSkills	0.802	0.310	0.916	2.582	0.016

a. Dependent Variable: System_Performance



H01: System Customization has no statistical effect on delivery of Services

From the table 2 we observe that t value = 2.331 which is greater than t=1.596 and significant level p=0.0027 which is less than 0.05 (p<0.05) according to the rule of thumb. This takes to reject the null hypothesis and accept alternate mean that System Customisation has a statistical influence on delivery of Services.

H02: There is no significant effect of computer processing speed on delivery of Services

From the same table above we observe t value, which is equal to 9.849 with p value of 0.000 approving the strong relationship between the computer processing speed and delivery of Services. According to requirement of rule of thumb we are also in position reject the null hypothesis and accept alternate: Computer processing speed has a statistical influence on delivery of Services.

H03: Level of IT Infrastructure statistical influence on delivery of Services.

The same table show the strong relationship between the level of IT Infrastructure in line with delivery of Services t value = 2.248 and p= 0.033 which is less than 0.05 according to the rule of thumb whose condition is satisfied we are in position to reject the null hypothesis and accept alternate. Therefore, Level of IT Infrastructure has a statistical effect on delivery of Services.

H04: Management skill has no statically effect on delivery of Services

From the table t value=2.582 and p=0.016 this satisfy the rule of thumb (t>=1.96 and p<0.05). We reject the null hypothesis and accept alternate which prove the significance of management skills delivery of Services.

Regression Analysis

Data was analyzed by a technique of regression analysis, this was basically done to examine the extend was an effect of independent variables on dependent variable. Results shown in the table

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.9140	0.8360	0.8110	0.260100

^aPredictors: (Constant), Management Skills, Computer Processing Speed, Facilitating_Conditions, Level Of IT Infrastructure

^bDependent Variable: delivery of Services

From the table 3 above the model summary of regression analysis shows that the dependent variables contributes with 83.6% of the variance in delivery of Services (R Square =0.836) this explains that only 16.4% of the variance in delivery of Services was taken by other variables which are not in study.

From the table 2 above the unstandardized coefficients shows that for every unity increase in System Customizations, a 1.101 unit increase in delivery of Services is predictable. In regard with computer processing speed every unit increase provide a predictable value of 0.395 increases in delivery of Services. Every unit increase in Level of IT Infrastructure, a 0.685 unit increase is predictable in delivery of Services. For every unit increase in management skills, a 0.802 unity increase is predictable in delivery of Services.

Therefore, the equation for the regression model is given by:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

$$Y = -0.609 + 1.101x_1 + 0.395x_2 + 0.685x_3 - 0.802x_4 + 0.112$$

Where

Y = delivery of Services

α = constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Régression coefficients.

X_1 = System Customizations

X_2 = Computer processing speed

X_3 = Level of IT Infrastructure

X_4 = Management skills

ε = Error

A similar study in the banking sector , empirical studies were carried using DeLone and McLean model [23], they established that System Quality was significant, most of the studies on electronic banking [23, 24] had uniform results with this study. Similar study [21, 22] in his study used D&M confirmed that System



customization was the most important used and customers were not satisfied by the service delivery of the system at the University.

Similar study done by [23, 24] indicated that level of information services provided to the customers was an important and critical factor to affect perceived quality and hence service delivery. Results of study by [25], analyzed by SEM, also by means of Delone and MClean theory indicated that trust in e-banking was associated with customer satisfaction. In a study on satisfaction with web based decision support systems [26], found that main factors to impact decision making satisfaction were information quality and system quality.

Conclusion

Based on the findings of this study, management information system is useful in running of the university activities as it can perform self monitoring in a system, determine a course of action and take action to get the system in control. Poor management information system has been identified as a bottleneck in the successful management of service delivery. Management Information System (MIS) is basically concerned with the process of collecting, processing, storing and transmitting relevant information to support the management operations in any organizations.

Result indicate that System Customizations, System processing speed and the level of IT Infrastructure are among the factors influencing the delivery of Services, however System Customizations and Level of IT Infrastructure portray a low performance, there need to consider installation of strong Computer components, suitable equipments to boost IT Infrastructure, specifically networking and more so Internet facilities. System Customizations calls upon baseline need assessment-narrowing down to application software needs, this will enable addressing true tasks for MIS consumers.

A Management Information System that is not well customized and one not well setup with proper IT Infrastructure (Access Points, optimum Servers, uninterrupted power backup, High capacity of Secondary primary and Secondary storage component) to provide the expected service delivery, it becomes difficult or impossible to take accurate and timely decisions on long and short term planning such results in poor delivery of services in terms of :upload of students marks, delays in timetabling, expenditure estimates, revenue estimate, cost of university programme, upload and download of students online resources. Ineffective use of MIS in decision making by the university usually results in failure of academic programmes, ineffective budgeting, and wastage of resources, inaccurate projection of students 'enrolment and manpower needs, poor motivation of staff, poor resource allocation among others.

Recommendation

Future studies should consider a boost on System Customizations; more effort is required on equipping IT Infrastructure both Hardware and software. Baseline needs assessment and analysis will be key. Future studies to consider narrowing down to application software needs. This study recommends wide sample size.

Reference

- [1]. IMF. (2010). Tracking Poverty –Reducing expenditures –Assessment and Action plan (AAP). 2001 Interaction, 16(1), 5-22.
- [2]. International Accounting Standards Board IAS1 (2007). Presentation of financial Statement Standard. Accessed 24 June 2007
- [3]. Liyala, O., S., (2012). PhD Thesis, Exploring Performance Ethnography to illuminate mobile banking Capabilities in Western Kenya: Capability Approach Study, DeMontfort University, 2012.
- [4]. Orlikowski, W., J., Barley, S., R., (2001). Technology and Institutions: What Can Research on Information Technology and Research on Organizations Learn from Each Other. *MIS Quarterly*, 25(2), 145-165.
- [5]. Orlikowski, W., J., (2000). Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. *Organization Science*, 11(4), 404-428.
- [6]. Government of Kenya. (2013) .Organization of the Government of the Republic of Kenya. Office of the President. Government Printer, Nairobi.



- [7]. Casals A., (2009). Integrated Financial Management Systems Best Practices: Bolivia and Chile,” funded under USAID Contract AEP-I-00-00-00010-00, Task Order No. 01 Transparency and Accountability, 2009.
- [8]. Nokuthula P. N. (2015) The Role of Management Information Systems in Measuring Organisational Performance in the KwaZulu, Natal Department of Arts & Culture, 1-140
- [9]. Casals, A., (2009). Integrated Financial Management Systems Best Practices: Bolivia and Chile,” funded under USAID Contract AEP-I-00-00-00010-00, Task Order No. 01 Transparency and Accountability, 2009.
- [10]. Mohamed, M.F., and Tahir, M.H. (2012). The adoption of Computerized Accounting System in Small and Medium Enterprises in Melaka Malaysia International Journal of Business and Management, No 18, 2012.
- [11]. Oladipupo, M. and Ajabe K. (2013). Computer –Based Accounting System in Small and Medium Enterprises: Empirical evidence from a randomized trial in Nigeria .Universal Journal of Management, 1(1)13-21.
- [12]. Brendan, G (2014, January). Systems Performance. Retrieved from <http://ptgmedia.pearsoncmg.com/images/9780133390094/samplepages/0133390098.pdf>
- [13]. Mohammed A., (2001). The Impact of Integrated Financial Management System on Economic Development: The Case of Ghana, M. A. Graduate School of International Studies, Korea University; E-mail: amislam@rocketmail.com; Tel: +002330208808034.
- [14]. Gray, G.L. (2011). Accounting information system selection in small organizations incongruence between accounting professionals,” Journal of information system .17-35.
- [15]. Sanja Michael Mutong’wa, Anthony J Rodrigues, Samuel Liyala ,(2017) Analysis of Partial Least Squares on Split Path Models: Underpinning Delone & Maclean Theory, Journal of Scientific and Engineering Research, 2017, 4(9):453-463, ISSN: 2394-2630 CODEN(USA): JSER
- [16]. Sanja Michael Mutong’wa,(2017),SMAUIT Computing Model: Driving Integrated Financial Management System, In Public Sector; School of Informatics and Innovative Systems, Jaramogi Odinga Oginga University of Science and Technology, Kenya
- [17]. Sanja Michael Mutong’wa ,Wasilwa, Mneria Esau (2014).A Comparative Study Of Critical Success Factors (CSF) In Implementation Of Mobile Money Transfer Services In Kenya Published by European Journal of Engineering and Technology, Vol. 2 No. 2, 2014.
- [18]. Venkatesh, V., and Morris, M., G., (2000). “Why Don’t Men Ever Stop to Ask for Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behavior,” MIS Quarterly (24:1), pp. 115-139.
- [19]. Venkatesh, V., Davis, F., D., and Morris, M., G., (2007). “Dead or Alive? The Development, Trajectory and Future of Technology Adoption Research,” Journal of the AIS (8:4), pp. 268-286.
- [20]. USAID, (2013). Addressing Procurement Bottlenecks. A Review of Procurement Bottlenecks in Bungoma County ,Webuye Subcounty-Misikhu Location,KenyaMedicine Supply Chains and Practical Approaches Taken. Arlington: USAID of Information Technology: Toward a Unified View,” MIS Quarterly (27:3), pp. 425-478.
- [21]. Wang, E., Chen, J., (2006). “Effects of internal support and consultant quality on the Consulting process and ERP system quality”, Decision Support Systems, vol. 42, n. 2: 1029-1041. <http://dx.doi.org/10.1016/j.dss.2005.08.005>
- [22]. Wang, E., Shih, S., P., Jiang, J., Klein, G., (2008). “The consistency among facilitating factors and ERP implementation success: a holistic view of fit”, Journal of Systems and Software, vol. 81: 1609–1621. <http://dx.doi.org/10.1016/j.jss.2007.11.722>
- [23]. Aburas, R., Raihan, N., & Hamid, A. (2013).Measurement models of automated systems Quality: A Study on the Banking Sector. International Journal of Scientific & Technology Research, 2(5), 74-79.
- [24]. Bharati, P., (2004).Employees and Information Systems: Task Support Satisfaction from the Other Side. Journal of Computer Information Systems, 43(2): 93–102.



- [25]. Koo, C., Wati, Y., & Chung, N., (2013). A Study of Mobile and Internet Banking Service: for IS Success Model. *Asia Pacific Journal of Information Systems*, 23(1), 65-86.
- [26]. Bharati, P., & Chaudhury, A., (2012). Product Customization on the Web: An Empirical Study of Factors Impacting Choice board User Satisfaction. *Information Resources Management Journal*, 19 (2): 69 – 81.

