Effect of Management Information Systems on the Effectiveness of Internal Audit in the Public Sector in Kenya

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Abstract
Governance and core business strategy view internal auditing as vital management tool which focuses on internal controls and monetary assessment. The Kenyan government is grappling with inefficiencies, wastage of resources, fraud, corruption and non-achievement of value for money which calls into question the role of internal auditing in management of resources. The purpose of the study was to investigate the effect of management information system on the effectiveness of internal audit in the public sector in Kenya, a case of the National Treasury. To achieve the above objective, the study was guided by the system theory in an attempt to explain the phenomena under study using descriptive research design. A sample of 139 internal auditors were selected from a target population of Three hundred and ninety-five (395) internal auditors drawn from the National Treasury in Kenya using stratified random sampling technique. Data was collected through online questionnaires sent through emails. The Descriptive statistics and regression analysis showed that management information system (adjusted R=.70) has a positive and significant effect on the effectiveness of internal audit. Further the descriptive findings supported the notion established by other studies that information system plays a vital role in ensuring efficiency and effectiveness of an organization's operations. Despite of the positive contribution that management information system can provide to an organization, this study found out that the internal auditors in the national treasury have not yet embraced the use of technology in their function and very few of them have been trained on the use of IFMIS which is the information system expected to be used by public entities in Kenya. On the basis of this findings the study recommends that there should be adequate budgetary provision for the requisite equipment, networking and reliable internet for easier communication and faster response as well as for proper training of the internal auditors on the use of IFMIS. These would streamline governance processes, management of risk and control systems and assisting management improving operations of organization.
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1. Introduction of the Study.

The structure and organization of public institutions has entrenched internal auditing as an important functional tool for better management of public resources. Huong (2018) states that strict observance of internal controls and monetary assessment is the major conventional area of interest of internal auditors. Furtherance to above tenet, staffs in auditing department execute fundamental mandate in the overall administration of public institutions as a functional tool to evaluate risk and optimization of limited organizational resources. Drogalas, Pazarskis, Anagnostopoulu and Papachristou (2017) states that present day internal audit function contributes immensely to the faster reliazation of organization objectives by initiating well structured and discplined perspective in appraisal of core business strategies. Internal audit function derive its legitimacy and effectiveness from independence of the team, competency and management commitment (El-sayed, 2011). Dittenhofer (2001) posit that the effectiveness of Internal Auditing (IA) has a positive effect on the policy of each department being audited.Efficient internal audit embeds the demand and growth for internal auditing services in establishment of robust and dynamic organizations hence able to manage change (Cohen & Sayag, 2010). Allignment of goals and outcomes has been championed by most authors by entrenching internal audit in terms of effectiveness in achieveing the objectives of its functions (Tahajuddin & Kertali, 2018). An internal audit has been defined as the eventual goal of an effective function, demonstrated in realization of the vision of a business entity (IIA, 2010),

In Kenya the public sector departments are formulated by the Constitution and the government through various legislations and publicly financed on behalf of its citizens. Internal auditing in Kenya was a concept of the colonial administration but was abolished as a recommendation of the Economic Commission Report of 1962. Due to the mismanagement of public resources, non-compliance to established laws, regulations and procedures it became apparent that its existence was vital and hence re-introduction in 1984. Internal re-organization of the said government departments was engineered in 1995, audit inspectorate came to being. Clustering ensured Internal Auditors were placed in provincial headquarters from where they conducted audit inspections. Another restructuring of the department was concluded in 1997, centralized and confined under the National Treasury which presents current structuring (Government of Kenya [GOK], 2014).

The Internal Auditing Department of the National Treasury plays an advisory role to the accounting officers in the Ministries, Departments and Agencies (MDA's). Most of the advice is pegged on best practices and standards that ensure authority and responsibilities are effectively discharged. Internal auditors are mandated to evaluate and give feedback on the efficacy of the internal control systems implemented by line managers in assessing viability of strategies entrenched in the organization practices. In addition, the department ensures conformity to the relevant laws that govern operations of public institutions. Lastly, the department ensures internal and external reporting in tandem to strict conformity to code of conduct (GOK, 2014).

Internal Auditor General Department (IAGD) is defined as a management concept aimed at self-regulating and actual intervention mechanism to minimize the adverse impact of risk exposure through predictable, robust and dynamic systems in tandem with identified needs of departments which is entrenched in Public Finance Management Act, 2012 (GOK, 2012). Roles include critical evaluation of the governance systems, mechanisms for transparency and accountability in utilization of public resources, collection and accountability of revenue. Secondly, strengthening internal control mechanisms, systems audit, conducting risk-based and value-for-money audits are impactful on attainment of the overall objectives of an entity. Additionally, verification of assets administration by the entity and ensuring that there are properly secured. Line managers are accountable in implementing good governance, risk management and control systems in the MDA's. The role of internal auditors is primarily assisting accounting officers and AIE holders in accomplishing their goals by assessing the adequacy of systems put in place by the top management under Section 160 of the PFM Act and regulations of 2015 (GOK, 2015)

1.1 Management information system and Internal Audit Effectiveness

Factors affecting internal audit effectiveness are diverse, conventional and sometimes unpredictable due to the circumstances of operations. Organizational independence, internal audit charter, management support, management perception, contributions of adequate and competent audit staff, professional proficiency, organization setting, scope of internal audit work, training, management information system, audit committees form the bulk of determinants of internal audit effectiveness (Shohihah, Djamhuri, & Purwanti, 2018). In the wake of advancements in technology the information system of any organization is a key determinant of the effectiveness of the operations in that entity. The revolution of information technology has significantly changed the nature of business operations and the public sector is not spared. A well-structured information system facilitates proper management of data, faster retrieval and dissemination of information which in return will aid in timely decision making. Thus, the purpose of this study that was aimed at assessing the effect of management information system on the effectiveness of internal audit in the public sector in Kenya.

1.2 Statement of the Problem.

Successful internal audit function is as a result of ensuring consistency in performance, sustainability and prevention of misappropriation of public funds (Badara & Saidin, 2013). For an audit to be termed as adding value, it is a conscious and deliberate effort of auditor's intention, roles and responsibilities, best practices encumbered with a high level of commitment based on established standards and policies (Ussahawanitchakit & Intakhan, 2011). According to Lenz and Sarens (2012) accounting scandals that brought down global giants querried effectiveness of internal audit in aiding organizations manage its resources. They asserted that, a robust internal auditing function could have identified and prevented such scandals from occurring.

Internal audit helps management to identify misalignment of internal controls thereby making an organization to be prone to risks of proliferation of public resources, corruption and accounting errors (Masika, 2013). Auditor-general raised questions about financial prudence of public institutions saying it is slowing down development (Kimanthi, 2019). The most recent scandals in Kenya have led to loss of funds and poor service delivery in concurrence to (Odoyo, Omwono & Okinyi, 2014). Office of Auditor General (OAG) in 2018 reported that in the financial year 2016/2017 revenue of Kenya Shillings 5.1 Billion was collected but never remitted to the Exchequer. In addition, the OAG expressed 64% qualified, adverse and disclaimer opinions on financial statements of 129 National Government entities representing questionnable expenditure amounting to Kenya shillings 1.5 Trillion. This study focuses on assessing how a strong information system can become a game changer in safegurding public funds through enhancing the effectivenss of the internal audit department.

1.3 Objective of the study

The purpose of the study was to investigate the effect of management information system on effectiveness of internal audit in Kenya.

1.4 Significance of the Study.

The study could be of significance to the National Treasury in gathering information relating to the key activities of internal audit and operationalization of the department. Efficient systems will facilitate faster and effective means to accomplish the goals of the organization. The research project could assist county and national governments in policy formulation and regulation of the internal audit departments in Kenya. This was because policies and regulations aimed at enhancing a robust internal audit have great benefits in increasing transparency, accountability, corporate governance, financial disclosures and adequate management of public resources. The study could help the legislature in both levels of governments in providing up to date information in prudent management of public resources and achieving value for money principles.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1. System Theory.

According to Nollet and Bealieu (2005), for a comprehensive outlook, system theory should explain the environmental influencers that design the structure of the auditing department in an organization. The principal agenda of system theory is to focus on deliberate tactical matters and political influences that shape up an organization auditing performance. According to Subramony and Douglas (2015) the systems theory help to understand the synergies that are required in the sector from all stakeholders particularly how various institutions and players in the sector ought to move together as a system in order to deliver efficiency. The theory also explains the institutional relationships that must be maintained within the sector, intra and inter-relationships. Intra-relationships can be viewed in the lenses of this theory as the relationships among the many institutions as a network in the sector while inter-relationships can be viewed as the internal institutional arrangements within each institution.

Jackson (2013) opines there exists two categories of system, the open and the closed system. Closed systems are systems that are not affected by the environment while open system was greatly influenced by the external environment. Feedback loops arising from systems that could be positive where it denoted lessons learnt or negative denoting areas which needed improvement within the whole system (Alavi & Leidner, 2001). Ghaffarzadegan, Lyneis and Richardson (2011) states that, system theory is relevant since it addresses the institutional framework where its application in auditing is further supported by the existence of various departments, sections and segregated professional disciplines, units, institutions which work together in sync to bring success. Unless, these parts work in sync, there cannot be success in the overall organizational objective in the sector. However, this theory does not give emphasis on a start and end point in the system and assumes that each element need to be guided or controlled, that if each element functions optimally the entire system will just flow. This theory they support management information system which is expected to facilitate a smooth running of the internal audit department as an independent body but at the same time facilitate proper functioning of the whole organization in ensuring safe use of the organizations' resources (Chikere & Nwoka, 2015).

2.2. Emperical Review

2.2.1 Management Information System and Internal Audit Effectiveness.

Management information system is an artificial intelligence and data dependent system which accords managers ability to plan, codify and assess departments within an organization (Beal et al., 2019). The researcher measured the variable in relation to acceptance, evaluation and finally controls. Acceptance is capacity of auditors to embrace technological advances and awareness of management information systems adopted by the users (Ahmad, Othman, & Jusoff, 2009). Evaluation is the aptitude of auditors in assessment of efficiency of systems in financial management (Lin & Wang, 2011). Finally controls refers to mechanism of ensuring integrity of financial and accounting information (Bromwich & Scapens, 2016).

Al-Mamary and Aziati (2013) points out that management information system (MIS) is a system of data conversion into information, disseminate it in the most useful manner to all stratas of management within an organization. MIS forms the basis of business planning and well organised management of operations through a structured platform of gathering, filtering,storing, recovering and disseminating information. MIS enables management and other stakeholders to access dependable information for planning and decision-making (Maribe, 2010). Moon (2012) asserts that MIS is a potent management tool for enhancing value adding services for businesses and clients from internal auditors. In line with this Lombardi et al., (2014) opined that for auditors to add value, auditing must espouse rapid technological changes and real-time capabilities to users of financial information.

Management information system in auditing operations control auditing security and reliability (Ahmad et al., 2009). Volume of data and information availed to the internal auditors aids in scrutinizing the internal controls intiated by senior management. For an organization to effectively evaluate the strength or weaknesses of internal control systems, internal auditors should possess expertise in information technology systems (Lin & Wang, 2011). Modern business environment have stretched the customary nature of auditing hence embracing technology in all aspects of internal auditing is mandatory especially with the trends in Kenya where the government has embraced the use of MIS tools like IFMIS, E-pay, GHRIS, E-procurement, E-revenue among others in its financial management. Pathak and Azzone (2015) stated that MIS has a positive influence on internal control systems in any business environment. The study found that organizations should empower internal auditors to acquire the requisite information technology advanced working modules inorder integrate both hard skills and soft skills which are in tandem with the paradigm shifts in auditing.

2.2.2 Internal Audit Effectiveness

Internal audit effectiveness is the standard whereby articulated goals are attained (IIA, 2010). Internal audit effectivenes was measured in relation to timeliness of reports, compliance and risk control. Timeliness of reports refers to the duration of time taken in execution of audit work and issuing of the reports to the management (KPMG, 2009). Compliance is the process of conforming to the laid down policies and procedures and alligning it with the decision made (Maribe, 2010). Finally, risk control is the mechanism of mitigating and manage the inherent and emerging threats in the organization objectives (Badara & Saidin, 2013).

For internal auditing to prove legitimacy in any organization it must aid in value addition and effectiveness to vital stakeholders (Lenz & Hahn, 2015). Ridley (2008) argues that in the new dispensation, internal auditing concentrates around triple E's of efficiency, economy and effectiveness. Where effeciency means the aspect of using minimum resources for maximization of outputs,economy is the obtaining resources in the most affordable manner while effectivenes is achieving the desired objectives. The study emphasized the supremacy of effectiveness against efficiency and economy despite the two being important to the services provided by any entity. Internal audit has a major bearing on the appropriateness operations and procedures of a section, department or an entity being audited (Dittenhofer, 2001). According to Lee and Park (2016) argued that when audit effectiveness is held constant, audit effeciency is denoted by the aggregate effort for more successful output including realization timeliness and quality of audit reports.

Internal audit functions have changed from conventional monitoring of financial transactions to include management of risk, internal controls and core business principles (Spira & Page, 2003). The wide knowledge of accounting,finance and auditing of internal auditors influences effectiveness of internal controls systems (Lee et al., 2016). Lenz and Hahn (2015) opined that effectiveness and added value of internal auditors are inseparable hence emphasizing the indispensability of internal auditors. (KPMG, 2009) infer that a large majority of senior management are not aware of internal audit activites and they don't appreciate the critical role of internal auditors in an organization. Lenz et al., (2015) view internal audit effectivenes as a concept of analysizing risk hence aiding an organization realize its goals by influencing positively the core business principles and strategic planning. Internal audit is a service provider to the organization and the research shows it varies from organization to organization depending on internal audit function structure.

Davies (2009) opined that a difference exists between a board and management that desires internal audit function to remain impartial and support the realization of objectives or board or management that unduly influences or gags the internal audit service from productively discharging its mandate and pontentially uncover matters that they are not comfortable with or could damage reputation of the organization. The assumption that delivering vital information to the top management is a measurement of effectiveness of internal audit (Mihret, Kieran, & Mula, 2010). They assessed the internal audit effectiveness as the level the auditing service is assisting organizations to meet objectives. Compliance to laws, rules,regulations and policies in a financial environment and aiding management in the overall achievement of objectives and management of risk is a fundamental way that internal auditing can be of benefit to an organization. (Davidson, Goodwin, & Kent, 2005).

3.0 METHODOLOGY

3.1 Research Design.

Descriptive research design was adopted in this research. It was a formal way of providing more answers on questions posed. It would reflect on the reality of the situation and strived to describe possible behavior, frame of mind and distinctiveness (Mugenda & Mugenda, 2003).

3.2 Target Population.

Target population is a representative group from which the research findings are generalizable (Mugenda & Mugenda, 2003). The study targeted a population of 395 GOK (2018) internal auditors in Kenya. The National Treasury was selected because it drew its mandate from the Constitution to operationalize the internal auditing across entire government set up.

3.3 Sample size and Samplling Procedure

The study adopted stratified random sampling method which accurrately reflect the population studied by ensuring that each sub-group within the population received proper representation within the sample The process of sampling entails dividing a large group into sub-group that have common characteristics. This sampling method demonstrated fairness and equality in selection (Kombo & Tromp, 2006). The internal auditors under the ambit of the National Tresury are decentralised into Sub Counties, Counties, Regional and Sector Heads. When determining an effective method of a sample in a factual research there is need to come up with a representative statistical sample. This study sampled 198 respondends based on Yamane's formula as illustrated below

The Yamane formula is used to calculate sample sizes. It states that:

$$n = \frac{\mathrm{N}}{1 + \mathrm{N(e)^{\wedge}2}}$$

Where n = sample size
N = population
e = margin of error of 0.05
From the estimated figure of 395, the sample size was:

n= $395/1+395(0.05)^2$ = approximately 198.

4.0 RESEARCH FINDINGS AND DISCUSION

4.1 Training on Information Technology.

The research sought to find out whether participants had received any training on information technology. The findings are shown in Table.4.5.

Table 0.1 Training on Information Technology

Whether participants received any training	**Frequency**	**Percentage (%)**
Basic Computer applications	99	73
IFMIS	23	15
None	17	12
Total	**139**	**100**

The study found that (99, 73%) of the respondents had received basic computer training while (23, 15%) of the respondents had been trained on IFMIS and (17, 12%) of the respondents had not received any training. The study has shown that a very low component of the internal auditors has been trained in related software hence the need to train them on auditing software. IFMIS is more of a larger ERP system which might largely impact on the general productivity of internal auditors.

4.2 Descriptive Findings on Management Information System.

The study sought to assess the effect of management information systems on internal audit effectiveness in the National Treasury on the basis of the extent to which the respondents agreed with the following statements;

Table 0.2 Statements on Management Information Systems

Statement	**Mean**	**SD**
Internal auditors have embraced technological advances in execution of the audit function.	1.823	.811
Internal auditors are aware of management information systems adopted by users.	3.382	.614
The management information systems help to assess the state of the internal controls.	2.702	.673
The use of management information systems improves on financial performance reporting.	3.546	.812
The use of MIS improve on the internal controls.	2.906	.845
The use of MIS help in detection of errors and fraud.	3.205	.643

On the respondents rating on validity of each statement as regards to management information systems as a determinant of internal audit effectiveness, statements were regarded as valid; on a scale of 1-5 majority of the respondents agreed on the importance of MIS in helping detect error and fraud (mean= 3.2015), Improving on financial performance (Mean= 3.546 assessing the state of internal controls (mean= 2.702) as well as improving the internal control system of the organizations (mean = 2.906). further findings show that the internal auditors are aware of the management information system used by other organization but unfortunately the study proves that the sampled internal auditors have not yet embraced the advancement in technology in execution of their function (mean= 1.823)

4.2.1. Suggestions of other Elements that can enhance the use of Management Information Systems

The qualitative comments of respondents were summarized in table 4.9 showing the main theme together with its frequency and respective percentages.

Table 0.3: Suggestions of other Elements of Management Information System.

Statement	**Frequency (f)**	**Percentage (%)**
Digitization	29	21
Advanced computer tools	13	9
Time basis information	11	8
Continuous training	49	35
Adequate resources	37	27
Total	**139**	**100**

The world is moving to the digitization represented by (29, 21%) essentially of all the business operations, internal audit is an indispensable service provider in achievement of organizational goals. Therefore, digitization of the internal audit function would improve service delivery. The respondents (13, 9%) mentioned that specialized computer tools would make the internal audit function to be proactive and timely reporting would be enhanced. The inherent characteristics of technology in real time and faster processing of information would aid management to make timely decisions this was represented by (11, 8%) of the participants. Most of the participants (49, 35%) stated that continuous training in terms of the ever-changing information technology operations where the internal auditor would be on top of the game in prevention of errors and detection of fraud. Adequacy of resources at the disposal of the internal auditors would give them the capacity to perform in their activities represented by (37, 27%) of the respondents.

4.3 Regression Analysis

4.3.1 Management Information Systems and Internal Audit Effectiveness

In determining the effect of management information system on internal audit effectiveness, regression modelling was adopted. Model summary and ANOVA were illustrated in Table 4.17 and Table 4.18 respectively. The model was based on the following.

Table 0.4 Model Summary for Management information systems and Internal Audit Effectiveness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.763	.705	.700	3.1901

Predictors: (Constant) Management Information System

Dependent Variable: Internal Audit Effectiveness

Table 4.15 showed adjusted R squared as .700 which indicated that 70% variation on dependent variable. Meaning 70% change in internal audit effectiveness can be explained by management information systems.

Table 0.5: ANOVA Summary

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**10.200**	**1**	11.200	8.963	.003
	Residual	**130.841**	**138**	.802		
	Total	**140.040**	**139**			

Table 4.18, showed p-value of .003, which was lesser than the p-value of 0 .05. The ANOVA output table indicated that the regression model was significant in predicting internal audit effectiveness in the National Treasury.

4.4 Discussion of findings

The study proved and supported the notion that management information system is critical in ensuring an effective internal audit functions. Prime objective of management information system should be to assist in performing audit in the most effective and efficient manner. Implementation of management information systems in auditing has helped streamline the examination process, and increase the value of the audit findings comparison. Davidson, Goodwin and Kent (2005) asserted that organizations benefit immensely from internal audit by helping in improving operations by ensuring total compliance to procedures and policies. This would show that the implementation of MIS creates transparency and accountability in public sector financial management. The findings of the study proof that the public sector has not yet embraced the use of technology in performing their duties. This can be used to explain the reason for the massive misappropriation of resources in the public sector in Kenya. Present day systems should be virtually accessible and be compatible with various devices. This implies that total adoption, integration and collaboration of information technology in business processes is crucial in the present configuration of the public sector. Technology plays a crucial role in storage, retrieval, tracking, presentation and reporting of information. Therefore, the adoption of management information systems aids the internal auditors in employing the best practices in execution of their mandates.

The study found that the management information systems help to assess the state the internal controls. Information technology is a vital component of strengthening internal controls and minimizing risks within acceptable levels. Maribe (2010) asserted that MIS enables management and other stakeholders to access dependable information for planning and decision making. Lombardi and Vasarhelty (2014) opined that for auditors to survive they embrace evolution of information technology in order to give assurances that add value to actual users of financial statements.

The study found that the deployment of information technology improves financial performance reporting. Adoption of technology and non - reliance on manual system of financial reporting largely contributes to the use of financial reporting software's. Moon (2012) posited MIS is a robust instrument for quality of audit services for appropriate management decision making. The study agreed that utilization of management information systems helps to detect errors and fraud. This implies that internal audit has internal mechanism capable of flagging any malpractices, intentional errors and report on time for appropriate action. Pathak and Azzone (2015) reiterated that organizations should ensure that auditors have acquired requisite information technology skills that integrate effective auditing and IT for optimal performance.

4.5 Conclusion and Recommendation

Investment in management information systems ensures that standards are set and maintained. Management is proactive in its response and review of performance from the output churned out by internal auditors. This enables management and internal auditors to fully play their part in strengthening governance processes. Failure to embrace the use of management information system had an adverse effect on the efficiency and effectiveness of the organizations in the public sector. This calls for not only implementation of a robust MIS but also continuous training of the internal audit staff to embrace the benefits that accrue from the use of advanced technology in operations. On the basis of these conclusions the study recommends that there should be adequate budgetary provision for the requisite equipment, networking and reliable internet for easier communication and faster response as well as for proper training of the internal auditors on the use of IFMIS. These would streamline governance processes, management of risk and control systems and assisting management improving operations of organization.

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