



**ADOPTION OF MANAGEMENT INFORMATION SYSTEMS AND PERFORMANCE OF PUBLIC AGENCIES IN
MOMBASA COUNTY, KENYA**

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Accepted: October 18, 2023

DOI: <http://dx.doi.org/10.61426/sjbcm.v10i4.2788>

ABSTRACT

Public agencies are faced with challenges that force them to adjust or change from their normal way of doing things. This study sought to investigate the relationship between management information systems adoption and performance of public agencies in Mombasa County, Kenya. The independent variables were information infrastructure, Information flexibility, Information security and Information storage while the dependent variable was performance of public agencies in Mombasa County. The study employed descriptive research design. The target population was 535 ICT specialists from 79 public agencies in Mombasa County. A stratified sampling technique was utilized. In this study primary data was gathered using research questionnaire. The data collected was both quantitative and qualitative and it was analyzed by both descriptive and inferential analysis. The descriptive statistical tools. The researcher conducted inferential analyses including correlation and multiple regression analyses. The study found that internet connectivity and IS software are the key aspects of information Infrastructure which affect the performance of public agencies in Mombasa to great extents. Information Flexibility contributes more to the increase of performance of public agencies followed by information Infrastructure, then information Storage while information Security contributes the least to the performance of public agencies. The study concluded that utilization of information infrastructure, information flexibility, information security, and information storage have great impacts on the performance of public agencies in Mombasa County. There is need to enhance the MIS infrastructure to ensure that it caters for its purpose in the organizations. The public agencies ought to put special consideration on information flexibility within the agencies. Public agencies need to invest in secure information systems that can assure staff privacy and protection. There is need for improvement in information storage through data protection, data backup, and data accessibility. This will also increase operation, enable information to be easily transmitted, enhance team performance, coordination and communication and data protection improves information quality and hence expanded organizational responsiveness.

Keywords: System Infrastructure, System Flexibility, Information Security, Data Storage, Agency Performance

CITATION: Mkongoh, R. M., & Kyalo, J. (2023). Adoption of management information systems and performance of public agencies in Mombasa County, Kenya. *The Strategic Journal of Business & Change Management*, 10 (4), 811 – 828. <http://dx.doi.org/10.61426/sjbcm.v10i4.2788>

INTRODUCTION

The information needs of modern organizations have become quite enormous and challenging to the extent that every organization needs to pay great attention to how information is gathered, stored, disseminated, and utilized. According to Gabriel, (2012) this situation has arisen because of factors such as increased organizational size, expanded operational scope, competitive influence, and overall environmental vagaries. Today's organizations require tools to support quicker and automated decisions, as well as ways to minimize uncertainty; only an effective management information system can ameliorate this challenge (Nokuthula, 2015). Scientific revolution in communication and information makes a comprehensive change in the life and business, which affects the ways that governments provide their services to populations.

Markgraf (2017) indicated that advancements in technology help to reduce managerial cost and human cost and make the work more accurate and faster, which makes the government agencies adapt electronic systems. The role of Information System (IS) management information system is to manage the data, organizing, retrieving of the information which help the organization to provide services faster, and market more accurate and easier, which also affect the level of performance. Adilson and Alberto (2018) pointed out that the problem of management information systems as a valuable tool to achieving organizational objectives is challenging to managers of any organization, especially the modern-day institutions. No organization can realize its goals and objective without a conscious effort using a well-organized management information system.

Yusuf and Aina (2014) indicated that management information system is an integrated manual computer system that provides information to support the operations of managements and the decisions making functions of a company. Sophisticated techniques must be used in acquisition of information which involves collection

from within and outside the organization (Yusuf & Aina, 2014). According to Nokuthula (2015), information systems are the catalysts for organizations that are transforming the nature of public agencies, the way they design, implement, and evaluate public policy, and the governance of public goods.

Information System includes the development and use of information systems that help businesses achieve their goals and objective (Kroenke, 2011). According to Nokuthula (2015) information system shows that communication is needed to conduct the managerial functions and for linking the organizations with its external environment. Information System provides communication link that makes the activities and responsibilities surrounding management or managers possible (Burns, 2011). IS helps middle management in short term planning, target setting and controlling the business functions.

The focus of IS coupled with improved processing led to the reduction in bottlenecks attached to the management process. 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 (Gabriel, 2012). An effective information system typically employs computers and other sophisticated technology to process information that reflects the day-to-day operations of the company.

Yusuf, and Aina (2014) revealed that IS satisfies the diverse needs through a variety of systems such as query systems, analysis systems, modeling systems and decision support systems, IS helps in strategic planning, management control, operational control, and transaction processing. IS helps the clerical personnel in the transaction processing and answers their queries on the data pertaining to the transaction, the status of a particular record and references on a variety of documents. IS helps the

junior management personnel by providing the operational data for planning, scheduling, and control, and helps them further in decision making at the operations level to correct an out-of-control situation. IS plays the role of information generation, communication, problem identification and helps in the process of decision making. IS, therefore, plays a vital role in the management, administration, and operations of an organization.

According to Richard, Devinney, Yip and Johnson (2009), performance refers to the real yield or outcomes of a given association as considered beside the expected targets. As indicated by Richard *et. al.*, (2009), firm performance measures the yield of a specific procedure or methodology, then adjusting the procedure or strategy to build the yield, increment proficiency, or increment the adequacy of the procedure or system. Giuri and Luzzi, (2013) pointed that the modern business environment, examination, and estimation of association's performance has gotten to be mainstream and assume a critical part in the achievement of the association and a ton of work has been done on this.

According to Robbins and Coulter, (2017) the common measures for organizational performance are organizational productivity and organizational effectiveness. Organizational performance is described as the range to which the company can meet the needs of owners and stakeholders for survival. Thus, performance can be viewed as the capability of an entity to produce results in a dimension determined a priori, in relation to a target. Andre de Waal (2017) study on analyzing organizational performance with the high-performance organization framework concluded that evaluation of strengths of the internal organization and improving product quality was a key aspect of improving organizational performance.

The performance of public agencies is measured in terms of service delivery to the customers. The public agencies are faced with challenges that force them to adjust or change from their normal way of doing things or the way they operate. This is due to

lack of proper infrastructure development in the country, inflexibility of the systems used in the government, poor security structure put in place and lack of effective storage systems among other challenges. These challenges hinder their effective performance.

Public Sector in Kenya includes but not limited to Ministry's, State Corporations, independent Constitutional Commissions, Semi-Autonomous Government Agencies, Universities and Hospitals. These organizations are established through institutional Acts of Parliament (Lianzuala & Khawlhing, 2018). Arguably, using the term IS can sometimes be erroneously interpreted as describing a system that can capture all the functional processes, and the relevant financial flows, within public expenditure management. However, the complexity of information systems within the Government sector is, to a considerable extent, due to the multiplicity of functions and policy areas.

According to Wanjiru (2017), IS can be explained to be a management tool, a system, and it should provide a wide range of non-financial and financial information. Over the years, according to Chene (2009), there has been an introduction of the MIS as one of the most common fiscal management reform practices aimed at the promotion of efficiency, effectiveness, accountability, transparency, security of data management and comprehensive financial reporting. In the context of the current development planning and visioning strategy (ROK, 2008), Kenya's development goal is to create and sustain an elevated level of economic growth whose benefit are invested to ensure a just and cohesive society enjoying equitable social development in a clean and secure environment.

In the Kenyan public agencies, IS helps achieve organizational objectives, plan, and control their processes and operations. It is also essential in helping them deal with uncertainty and helping them in adapting to change or initiating change. Kwena (2013) in a study of Kenya's ministries found that the capacity and technical knowledge was low due to lack of training and hurried implementation

of the system. He comments that the users of the system need to undergo on-the-job training to improve their skills and capacity to use the IS. This study sought to establish the relationship between IS adoption and performance of public agencies in Mombasa County, Kenya.

Statement of the Problem

The objective of Information System is to manipulate data, processing, organizing, and retrieving of the information that assists the organization to enhance its competitive advantages. As per Wanjiru (2017) fast changing markets, industries, and services require organizational environments capable of constant adaptation with bright innovative ideas and reduced time-to-market. Likewise, governments and their agencies have found it difficult to provide an accurate, complete, and transparent account of their financial position to parliament to other interested parties, including donors and the public (Yousefi, 2016). For IS to run properly it requires improved, efficient, and up-to-date infrastructure. However, poor information infrastructure layout has led to deficient performance in the public agencies. As asserted by Hendricks (2012), the effective implementation, operation, and maintenance of IS requires staff with necessary knowledge and skills.

Agrawal and Nyamful (2016) indicated that many public organizations continue to struggle despite having Information System in place. The inflexibility in the public agency in their adoption of Information System has led to inconsistency in performance in public agencies (Yousefi, 2016). Also, the lack of information security has hindered transparency and the enforcement of accountability in government, and has only contributed to the perceived governance problems in many of the developing countries in the past decade, developing countries have been encouraged to reform their public expenditure Information Systems and have increasingly embarked on major projects to computerize their government operations.

Kenya Vision 2030 had a vision of Public service as “a citizen-focused and purposeful” institution

-serving a rapidly growing economy and society. Furthermore, Kenya recognizes that a modern and results-focused public service is a pre-requisite for the country’s socio-economic transformation as envisaged under Vision 2030 (Kwena, 2013). To this end, measures have been initiated to improve public service delivery such as automation of services. As per Wanjiru (2017), the Constitution sets out the overall guidelines on the management of public resources and provides for enactment of specific legislation to give effect to the same. Modern organizations in the public sector are grappling with challenges of mode of paying per diems to public sector staff. MIS is one of the ICT tools used every day at the modern workplace with its invaluable benefits (Kwena, 2013). Despite these valuable benefits of ICT use in time and attendance management, several resistances have been recorded against ICT adoption in workplaces.

Munene, Namusonge and Iravo (2014) investigated the factors affecting the implementation of management information system in selected financial cooperatives in Nairobi and revealed that the factors: training, cost, infrastructure, and regulations affected the implementation of MIS in selected financial cooperatives in Nairobi. Miheso (2013) studied the adoption of Integrated Financial Management Information System (IFMIS) by the National Government in Kenya. The study showed that on average adoption was above 50% with some going as high as 80%. Initially, the implementation was done correctly in some institutions, for example in the Central bank, but this has not been met with resounding success in the ministries and has not attained most of the intended objectives. Among the public sectors in Kenya there is deficient performance in the public agencies in Kenya hence there is need for Information System adoption. The public agencies are faced with challenges that force them to adjust or change from their normal way of doing things or the way they operate. This is due to lack of proper infrastructure development in the country, inflexibility of the systems used in the government,

poor security structure put in place and lack of effective storage systems among other challenges. This study, therefore, sought to investigate the relationship between Information Systems adoption and performance of public agencies in Mombasa County, Kenya.

Research Objectives

The general objective of this study was to establish the relationship between Information systems adoption and performance of public agencies in Mombasa County, Kenya. The specific objectives included:- to assess the influence of Information Infrastructure on performance of public agencies in Mombasa County, to find out the role of Information Flexibility in the performance of public agencies in Mombasa County, to determine the effect of Information Security on the performance of public agencies in Mombasa County and to explore the relationship between Information Storage on performance of public agencies in Mombasa County.

LITERATURE REVIEW

Empirical Review

This section shall discuss the relation between Information Infrastructure, Flexibility, Security and Storage to the performance of public agencies. IS is a dynamic concept that can be changed, repeatedly, by changing the work administration? It constantly reacts with the internal and external environment of work and expands the corrective technique in the system, so those information requirements are effectively changed (Amenta, 2017). Information System is flow-processing procedures based on computer data and integrated with other procedures to provide information in a timely and effective manner to support decision-making and other management functions. The objective of information system (IS) is to manipulate data, process, organize and retrieve information that assists the organization to enhance its competitive advantages (AL-Gharaibeh & Malkawi, 2013). The revolution in information technology has significantly affected organizational performance

and created competitive advantages for those who are eager to counter business challenges.

Arrawatia and Meel, (2012) and Nowduri, (2011) agreed that IS encompasses a system that utilizes information to ensure the appropriate administration of organizations. All aspects of IS work in conjunction to ensure the efficiency of the entire system. Therefore, failure in one-part results in the total failure of the other parts as they are all designed to work in a coherent manner. A study by Ndlovu, (2015) depicted the term IS in measuring organizational performance in government organizations. The study concluded that the function of IS in measuring organizational performance was limited in the KwaZulu-Natal Department of Arts & Culture. The major reason for this is because the firm does not have an integrated IS or adequate capacity to improve and run such a system. The study by Khresat, (2015) examined the relationship between IS that involves (software, devices, and databases) and organizational performance in Jordan. The study found that the staff in Jordanian telecommunication companies have positive behavior towards IS.

The exploitation of IT has affected the value and substance of information, decision making is no exception. According to Vertmaat and Shelly (2011), society has reaped many benefits from using computers. Both business and home users can make well informed decisions because they have instant access to information from anywhere in the world. Students as another type of user have more tools to assist them in the learning process. Benefits from using computers are possible because computers have the advantages of speed, reliability, consistency, storage, and communication. This study sought to establish the effects of IS adoption on performance by focusing on Information Infrastructure, Information Flexibility, Information Security, and Information Storage.

Jayaram, Shawnee and Droge (2014) thesis on information system infrastructure effects and process improvements on supply chain time performance includes of an empirical study carried

out on 57 top tier automotive industries to examine the direct and complimentary effects of Information System Infrastructure (ISI) and process management on periodic performance. The findings are that the three dimensions of Information System Infrastructure (ISI) namely, information technology, design technology and manufacturing technology directly influence at least one dimension of time-based performance. The study also supports the idea of concurrent operation of information system infrastructure and process improvement to enhance cycle time performance in supply chain. Choi and Tulu (2017), study on user experience and effective system interface in a health application. The study uses mixed methods consisting of a controlled experiment and a follow up survey to evaluate the hypothesis. The study's findings are that system interface in this case touch technique and target direction has a significant impact on the task completion time as well as application user interfaces perceived usability and likability.

Khresat (2015) documented the effect of information system on organizational performance on Jordanian Telecommunication Companies. The study examined the reality of information system and organizational performance and investigated the relationship between information system and organizational performance in Jordan. The study applied on all telecommunication companies located in Amman city, a sample of (100) employees from (10) branches of telecommunication companies were selected randomly for this study. The study revealed that employees in Jordanian telecommunication companies have positive attitudes towards information system (IS). In addition, the study result found that there is a statistically significant association between information system and organizational performance in telecommunication companies in Jordan.

Yassine (2017) conducted a study on the role of information systems in the effectiveness of managerial decision making in Greater Irbid Municipality, to identify the effectiveness of using information systems in managerial decision making

in greater Irbid Municipality. The analysis of the study instruments and its hypotheses revealed that information systems have a medium to high effectiveness role in greater Irbid municipality, information systems have a role in providing the required information to make managerial decision that their degree of convenience range from moderate to high, there is a relationship between the uses of information systems and the effectiveness of managerial decision making and improving information systems influences the effectiveness of managerial decision-making.

AL-Gharaibeh and Malkawi (2013) examined the impact of information systems (IS) on the performance of governmental organizations, Jordanian Ministry of Planning – case study. The study sample included (77) employees in the ministry, the study presented that, first, there is no association between software and hardware and the performance of governmental organizations, second, there is a significant association between networks, individuals and procedures, and information system as a whole and the performance of governmental organizations. Asemi, Safari and Asemi (2011) assessed the role of IS and Decision Support System (DSS) for Manager's Decision-Making Process. It was found that MIS is best suited to identify problems and help management to understand them to make suitable decisions. On the other hand, Decision Support System (DSS) are tailored to the specific needs of individual and group managers. Therefore, the result showed that Decision Support System (DSS) can extend its support to the same steps of decision-making process and has more roles in decision-making and problem solving than IS.

Gebauer (2015) studied information system flexibility and performance of business processes. The study implemented the optimization model to relate business process characteristics with two basic types of information system flexibility namely, flexibility to use the IS and flexibility to change the IS. The study acknowledged that IS supports organizational flexibility among other internal

capabilities. The study, however, only focused on the changes made and failed to touch on user perceptions and data processing abilities. This study goal is to establish the influence of IS flexibility regarding user acceptance, version upgrades and data processing affects the overall performance of public agencies in Kenya.

Nokuthula (2015) conducted a study on the role of information systems in measuring organizational performance in the KwaZulu-Natal Department of Arts & Culture. Government departments collect process and use information for planning and reporting to comply with diverse legislation at operational and strategic level. Information systems play a vital role in the collection and processing of information, making it possible to process copious quantities of information, and synchronize and share it. The study concluded that the role of MIS in measuring organizational performance was limited in the department. The department did not have an integrated Performance Information System (PIS) or adequate capacity to develop and manage such a system. The study recommends that the department should formalize its performance measurement framework and build capacity to fully implement a Performance Information System (PIS).

Yusuf, Isyaka and Kazeem (2014) conducted a study on the impact Information System (IS) on the Performance of Business Organization in Nigeria. The role of Information System (IS) in business environment has evolved over time to become an integral part of its business operations in Nigeria. This study looks at various challenges and prospect of IS in Nigeria. The study was conducted in Federal Capital Territory, Abuja, North-Central Nigeria with the use of questionnaire and interview to collect data that was statistically analyzed using the Z-test. The study also attempts to highlight the impact of information system in Nigeria Business Organization. It intends to determine how the information system helps an organization to perform effectively.

Yaser, Alina and Nor (2014) conducted a study on the meaning of information systems and its role in telecommunication companies in Yemen.

Information systems are one of the most important tools in any organization, which aims to provide dependable, complete, accessible, and understandable information in a timely manner to the users of the system. They established that information systems assisted in automating tasks. Automation can save time, money, resources, reduce employee's staff, and enhance organizational workflow. In addition, assist in increased organization productivity, effectiveness, increase customer satisfaction, and efficiency of the work. In the telecommunication companies, IS in general enables them to collect, process and store information; with the overall purpose of making that information available on demand in the required format. Telecom Companies can't work without information systems as the number of participants in these companies is more than a million subscribers, so it's hard to save their data using the manual method (using files).

Wanjiru (2017) performed a case study on youth polytechnic development projects in Embu county and information systems attributes on project performance. Data collected was analyzed by use of descriptive statistics; frequency tables mean. Cronbach's alpha test was used in assessing reliability of research instruments. The study concluded that software used to generate quality information needed by project managers helped them perform their tasks professionally thus increasing project success. The study also concluded software quality had a significant role in system acceptance by users.

Information security has been on the frontline in maintaining companies' integrity and secrecy. Information is an asset for any firm planning to succeed in its operations. In today's age, the company that has the right, correct, up to date information at the right time is most likely to beat its competitors. Kong, Jung, Lee and Yeon (2015) conducted research of the Korean Securities Industry on information security and organizational performance. The study population was retrieved from the Korean financial investment association

and comprised of group employees of sixteen domestic branch security officers. This study's finding was that activities in relation to information technology service infrastructures, investments, information security and sharing were confirmed as motivational factors and not as hygiene factors as per Herzberg's two-factor theory. The study did not relate information security and performance.

Kroll, (2015) explained that the relationship between the use of information systems and their impact on organizational performance is a positive relationship and a significant improvement in the organizational performance of the organizations. Mwita (2015) investigated the factors affecting information systems security effectiveness in the University of Nairobi. The target population was all administrative staff of University of Nairobi. The study concluded that the IS security model effectiveness was significant at the five percent significance, this indicated that a well formulated and communicated ICT security policy, top management support of IS security related matters, training and awareness creation and organizational culture strongly influenced the effectiveness of IS security. The current study focused on relating information systems security and performance of public agencies in Kenya.

According to Eshraghi, Ganjoui and Esmacili (2014) storage of information are major concerns in this era of information systems. The ability for storage devices to scale to meet the rate of data growth, enhance access time and data transfer rate is equally challenging. These factors, to a considerable extent, determine the overall performance of data storage and management. Agrawal and Nyamful (2016) indicated that data storage requirements are complex and thus needs a holistic approach to mitigate its challenges. The qualities of these storage devices can have a significant impact on the entire storage system. The ability of the storage device to scale, its access time, data transfer rate, and cost-effectiveness, can be critical in the big data environment.

Agrawal and Nyamful (2016) conducted a study on the challenges of big data storage and management. Using desk review, they established that storing and maintaining large sets of data over time at the rate of growth can be challenging. Factors such as capacity, performance, throughput, cost, and scalability participate in any ideal storage solution system. In addition, storage devices play a key role in mitigating big data challenges. Reliability is of equal concern for big data storage. Reliability is the retrieval of data in its original form without any loss. The issue of reliability considers both internal and external system failures, and vulnerabilities.

Almazan (2017) conducted a study on the influence of IS on organizational results using 133 companies in Tamaulipas, Mexico. Their findings were that companies that were keen on improving the quality of information and accompanying systems had a productive impact on the overall performance of the organization. From their results, the ability of production systems to recover, and in a timely manner is very crucial in the era of big data. Abugabah (2011) looked at both theoretical model and critical review on the influence of data storage systems on user performance. The study findings were that a proposed model that links user characteristics, system and information quality and task technology were fit to enable an information system to be easily operated hence improving user performance. Accordingly, choosing the right storage devices, management tool, and efficient techniques is relevant and determines the rate of growth. The approach to big data storage and management can significantly affect an entire organization. Organizations and businesses are now more concerned about how to efficiently keep and retain all their data.

METHODOLOGY

Orodho (2012) defines research design as a general layout that is used to answer research questions. This study will adopt descriptive research design. It is a plan on how to answer research questions. The research design constitutes the blueprint for the collection, measurement, and analysis of data. A

descriptive research design was used in this study. Descriptive research is important because it acts as a precursor to quantitative research design and the general overview provides some valuable indicators on variables that are worth testing quantitatively. When a description of a phenomena or object is required for the research, the descriptive study design is recommended since it can give more details on the variable being studied. It offers illustrations of the traits of the phenomenon or group being studied (Sekaran, 2021). The design is user-friendly, observes participants in their natural environment, and generates a large amount of data. The method allows for thorough data analysis, leaves room for future research, and allows for detailed data collection and the capacity to identify the factors under investigation (Mugenda and Mugenda, 2018).

The target population is the total of all the individuals or items that have certain characteristics which are of interest to a researcher. Mugenda and Mugenda (2012) describes target population as a complete set of individual cases object with some common characteristics to which researchers want to generalize the result of the study. In the context of this study the target population was 535 ICT specialists from the public agencies in Mombasa County of which the statistical attributes were estimated. The target population was drawn from 79 agencies in the financial sector, commercial & manufacturing sector, regulatory agencies, service corporations, training and research institutions and regional development, among others.

To this study, the target respondents were at least three ICT specialists such as system administrators, database managers, software engineers, network engineers and integrators sourced from the 79 agencies offices in Mombasa. This therefore constituted the staff who were in day-to-day ICT operations in these selected organizations. These employees were also selected because they were core, had expertise and more technical knowledge in IS adoption and performance of public agencies

in Mombasa and participated in giving credible information required by the study.

The identification and selection of elements that make up a sample are at the heart of all sampling techniques. Mugenda and Mugenda (2012) envisage that the accuracy of generalization of research findings depends on the degree to which the sample, accessible population and the target population are similar on salient characteristics. The sampling frame for this study was the public agencies in Mombasa County. After distinguishing the objective population, the study applied the stratified random sampling research plan to recognize the strata or subgroups that represent the whole populace dependent on the respondent's depictions drawn from various classes. A stratified sampling technique was utilized where selected respondents were gathered by the different departments they are drawn from. Stratified sampling technique was utilized to guarantee that the sample populace for the study is decent portrayal of the general populace and decrease instances of inclination.

The technique was also simple to complete and of exceptionally high proficiency. Stratified random sampling is fitting in this study to break the number of respondents into commonly through sample populace called strata. According to Mugenda (2008) sample size of between 10-30 % of the target people is viewed as illustrative of the population under scrutiny and frequently gives slid outcomes. The sample size that was used in this research was 14.21% of the target population. This generated a sample size of 76 respondents. This was drawn proportionally from different public agencies in Mombasa County.

Data Collection Instrument

Mertens (2010) define data collection instrument as a device that specifies and objectifies the data collecting process, instruments are usually written and may be given directly to the subject to collect data or may provide objective description of the collection of certain types of data. According to Mugenda and Mugenda (2012), a researcher needs

to develop instruments with which to collect data. To achieve the research objectives primary data was used to answer the research questions. Primary data collection was via a questionnaire as this is an efficient and convenient way of gathering the data within the resources and time constraints. Questionnaires consisting of structured and non-structured questions were used to collect data from the personnel working in the ICT department of the public agencies in Mombasa County. The structured questions were used to collect quantitative and qualitative data. The quantitative method of data collection was used for this study by generating numerical data that was used to quantify the problem.

Validity, according to Smith, M. (2018), is a gauge of appropriateness and accuracy. To ensure accuracy, clarity, and suitability, the pre-test of the questionnaires was used as a guide for enhancing and correcting the research questionnaires. An instrument pre-test was conducted to pre-test the research instruments. The researcher selected ten respondents for the pre-test who were based on public agencies in Nairobi County. The researcher administered the questionnaire in person. During the pre-test, the clarity of the research instruments was assessed. Data collected in the pre-test was analyzed and reliability checked using Cronbach's alpha, and results from the pre-test were used to improve and strengthen the data collection instrument.

Data reliability measures the extent to which measures used are free from sampling errors. Reliability ensures that the measures used produce similar scores over time in different methods and across multiple measures (Mugenda & Mugenda, 2012). The reliability test that was used for this study will be Cronbach's alpha test. A greater number of items in the test can artificially inflate the value of alpha and a sample with a narrow range can deflate it, so this rule of thumb should be used with caution. The closer Cronbach's alpha coefficient is to 1, the higher the internal

consistency reliability. A coefficient of 0.7 is recommended for a newly developed questionnaire.

Data Analysis and Presentation

Data analysis and presentation is conducted to inspect, clean, transform and model data with the aim of identifying and highlighting useful information that can be used to support the decision-making process. The qualitative and quantitative analysis of data was done to answer the research questions of this study. First, the data collected was fed into the Statistical Package for Social Sciences (SPSS). Descriptive analysis was used to describe the data in terms of frequencies, percentages, mean scores, and standard deviations among other descriptive statistics. In addition, inferential statistics were done whereby regression analysis will be used to explore the relationship between study variables. The data was broken down into the various aspects of IS adoption affecting the performance of public agencies in Mombasa. The regression equation was:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon:$$

Where, Y = performance of public agencies
 X_1 = Information Infrastructure
 X_2 = Information Flexibility
 X_3 = Information Security
 X_4 = Information Storage.

Further, β_0 = the regression intercept, $\beta_1, \beta_2, \beta_3$ & β_4 = Regression Coefficients and ϵ = Error term normally distributed about a mean of 0 and for purposes of computation ϵ is assumed to be 0. Qualitative data was analyzed through an evaluation of the common notions and would be presented in the form of a discussion. This data was presented in graphs and tables.

FINDINGS

The researcher extracted the model summary which portrays the coefficient of determination. This section presents the R-value which is the measure of association between the dependent and the independent variables, the R Square which is the coefficient of determination measuring the extent at which the independent variables influence

the dependent variable as well as the Adjusted R Square which measures the reliability of the

regression results.

Table 1: Model Summary

| Aspect | Value |
|----------------------------|-------|
| Model | 1 |
| R | 0.872 |
| R Square | 0.760 |
| Adjusted R Square | 0.751 |
| Std. Error of the Estimate | 0.573 |

The findings show that *R*, which is the multiple correlation coefficients, shows quality of the prediction of the dependent variable by the independent variable is 0.872. This is a good indication since it points to a strong correlation. The *R-Square* which is the coefficient of determination shows that the four independent variables which include Information infrastructure, Information flexibility, Information security and Information storage in the model explain 76.0% of performance of public agencies in Mombasa County. Subsequently from the Adjusted R-Squared it is evident that after adjusting the model for inefficiencies the independent variables can explain

75.1% of performance of public agencies in Mombasa County.

Regression Analysis

To answer the proposed model for the relationship between performance and the independent variables, the regression coefficients were calculated and presented in Table 2 below. These with their significance values (also given in the table) measures the effect of each independent variable on performance of public agencies in Mombasa (dependent variable) and the effect that would occur to performance of public agencies in Mombasa to changing (increasing or decreasing) these variables.

Table 2: Regression Coefficients

| Model | Non-standardized Coefficients | | Standardized Coefficients | t | Sig. |
|--------------------|-------------------------------|------------|---------------------------|---------|--------|
| | B | Std. Error | Beta | | |
| (Constant) | 4.778 | 0.453 | | 10.5475 | 0.0429 |
| MIS Infrastructure | 0.862 | 0.114 | 0.024 | 7.5614 | 0.0150 |
| MIS Flexibility | 0.879 | 0.108 | 0.029 | 8.1389 | 0.0133 |
| MIS Security | 0.646 | 0.173 | 0.086 | 3.7341 | 0.0463 |
| MIS Storage | 0.712 | 0.137 | 0.064 | 5.1971 | 0.0264 |

The coefficients in Table 2 answer the regression equation relating the dependent and the independent variables. Evaluating the significance of the coefficients at 95% confidence level, the table indicates that all the variables had a significance value less than 0.05 thus confirming the significance of the results. Also, from the table, all the variables indicated a positive coefficient indicating a positive relationship between the dependent and independent variables. Based on these coefficients, the regression model ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4$) therefore becomes.

$$\text{Performance} = 4.778 + 0.862 \text{ Infrastructure} + 0.879 \text{ Flexibility} + 0.646 \text{ Security} + 0.712 \text{ Storage}$$

The model indicates that, holding the predictor variables constant, the performance of public agencies would have a coefficient of 4.778. From the results, the regression coefficient for Information Infrastructure is 0.862. This had a significant value of 0.015 which is less than 0.05 depicting the significance of the relationship between information Infrastructure and performance of public agencies. Therefore, based

on these, there is a positive and meaningful relationship between Information Infrastructure and performance of public agencies. A unit increase in the Information Infrastructure would result to 0.862 times increase in performance of public agencies in Mombasa.

The results also show that the performance of public agencies is positively and significantly related to Information Flexibility. This is indicated by a regression coefficient of 0.879 which is a positive coefficient and a p-value of 0.0133 less than 0.05 showing the significance of the relationship. Based on the coefficient, it is evident that a unit increase in information Flexibility would result to 0.879 times increase in performance of public agencies. Information Security was also seen to have a positive effect on the performance of public agencies. This is shown by the regression coefficient of 0.646 with a significance value of 0.0463 which is less than 0.05 the critical value at the 5% level of significance. This therefore shows that given a unit increase in Information Security would result to 0.646 growth in performance of public agencies.

The regression model also shows that Information Storage is positively related to the performance of public agencies. The regression coefficient for this was obtained to be 0.7120 with a significant value of 0.0264 less than 0.05 indicating a significant effect of Information Storage on performance of public agencies. Thus, a unit growth in Information Storage would result to 0.7120 times increase in performance of public agencies. Therefore, according to the study findings Information Flexibility contributes more to the increase of performance of public agencies followed by Information Infrastructure, then Information Storage while Information Security contributes the least to the performance of public agencies

SUMMARY AND RECOMMENDATIONS

The purpose of the study was to investigate the influence of IS adoption on the performance of public agencies in Mombasa County. The essence was to fill the gaps in the literature review by

analyzing the relationship that existed. The public agencies are faced with challenges that force them to adjust or change from their normal way of doing things or the way they operate. This is due to lack of proper infrastructure development in the country, inflexibility of the systems used in the government, poor security structure put in place and lack of effective storage systems among other challenges. The contextual scope of the study was Mombasa County where the agencies and organizations in the public sector participated in the study. The study involved collecting information from the ICT staffs who incorporated the ICT Mangers, network engineers, network administrators, system administrators, software developers, software engineers and system integrators, among others on the influence of IS adoption on performance of public agencies in Mombasa County, Kenya.

The study employed descriptive research design. The target respondents were selected as they are responsible for the day-to-day operation of the agencies. The specific objectives of the study were to assess the influence of Information Infrastructure on performance of public agencies in Mombasa County; to find out the role of Information Flexibility on performance of public agencies in Mombasa County; to determine the effect of Information Security on performance of public agencies in Mombasa County; and to explore the relationship between Information Storage on performance of public agencies in Mombasa County. Stratified sampling technique was utilized.

In this study primary data was gathered using a research questionnaire. The researcher dropped the questionnaires physically at the respondents' place of work and picked them up once filled up. The data collected was both quantitative and qualitative and it was analyzed by both descriptive and inferential analysis. The Statistical Package for Social Sciences and MS Excel helped the researcher to describe the data. Averages, frequencies, and percentages accurately served this purpose. From the sample population, 64 questionnaires were received fully filled which translated to a response rate of 84.2%

which was adequate for the analysis. Inferential statistics, particularly regression analysis, were used to predict the effect of IS adoption on performance of public agencies in Mombasa County.

The study found that most of the respondents (48.4%) would rate the adoption of IS in public organizations to be moderate. From the findings, Information infrastructure affects the performance of their agencies to a great extent. The study found that internet connectivity and IS software are the key aspects of Information Infrastructure which affect the performance of public agencies in Mombasa to great extents. In addition, IS hardware affects the performance of public agencies in Mombasa to a moderate extent. From the study, there was agreement on that IS interface has a significant impact on the task completion time, information system infrastructure enhances cycle time performance in public organizations and information system application user interfaces perceived usability and likability. However, there was neutrality on that employees in public agencies have positive attitudes towards information system and that information systems have a role in providing the required information to make managerial decision.

The study also found that Information flexibility affects the performance of the public agencies within Mombasa County to a moderate extent as indicated by 46.9% of the respondents. Data processing and user acceptance affect the performance of public agencies in Mombasa to a great extent, while versions upgrades affect the performance of public agencies in Mombasa to a moderate extent. There was affirmation that flexible Information systems provide reliable, complete, accessible, and understandable information in a timely manner, flexibility of information system management offers incredible support to the organizational processes, Information flexibility plays an important role in the collection and processing of information, making it possible to process large quantities of information, and synchronize and share it, and that flexibility of

information systems save time, money, resources, reduce employee's staff, and enhance organizational workflow.

The study further found that Information security affects the performance of public agencies in the County to a great extent according to 39.1% of the respondents. From the study, authentication in information systems and data protection affect the performance of the agencies to great extents, while verification in IS affects the performance of public agencies to a moderate extent. There were agreements on that top management support IS security related matters in the organizations, and Information security enforcement is a motivational factor for adoption and hence performance. However, there was neutrality on that training and awareness creation and organizational culture strongly influence the effectiveness of Information security, the public agencies have well formulated and communicated ICT security policy and that MIS security model effectiveness is significant in enhancing staff confidence in the public organizations.

The study established that MIS storage affects the performance of public agencies in Mombasa County to a moderate extent according to 56.3% of the responses gathered. Data protection and data accessibility affect the performance of public agencies in Mombasa County to a great extent. On the other hand, data backup affects the performance of public agencies in Mombasa County to a moderate extent. Data backup is incredibly significant in enhancing information processing, analysis, and decision selection and action implementation and that data storage increases operation where most of the activities are technology-based, hence requiring minimal supervision. In addition, system and information quality enable information to be easily transmitted hence improving performance MIS data storage enhances team performance, coordination and communication and data protection improves information quality and hence expanded organizational responsiveness.

In overall, IS adoption affects the performance of public agencies in Mombasa to a moderate extent. IS adoption affects performance contracts targets to a great extent, while IS adoption affects development of internal processes and employee productivity to moderate extents. From the regression analysis, the four independent variables in the model explain 76.0% of performance of public agencies in Mombasa County. From the ANOVA test, F calculated was greater than the F critical showing that the overall model was significant, thus there is a significant relationship between IS adoption and performance of public agencies in Mombasa County. Information Flexibility contributes more to the increase of performance of public agencies followed by Information Infrastructure, then Information Storage while Information Security contributes the least to the performance of public agencies.

The study concludes that there is a moderate rate of adoption of IS in the public organizations in Mombasa County. The utilization of Information infrastructure has resulted in a meaningful change in the performance of the public agencies in Mombasa to a significant level. IS software, IS hardware, internet connectivity information technology, design technology and manufacturing technology directly influence the performance of public agencies to considerable levels. IS encompasses a system that utilizes information to ensure the appropriate administration of public organizations and all aspects of IS work in conjunction to ensure the efficiency of the entire system.

The study deduces that Information flexibility plays a significant role in the performance of public agencies in Mombasa County. It is evident that user acceptance, upgrades and processing of data are the fundamental aspects of Information flexibility that affect the performance of organizations. The flexibility of IS has a profound influence on the performance of the public agencies. Information Flexibility saves time, money, resources, enhances organizational workflow, assists in increased

organization productivity, effectiveness, and increases customer satisfaction, and efficiency of the work.

The study further concludes that Information security is a key determinant of the performance of public agencies in Mombasa County. Accordingly, security involved in safeguarding, authenticating, and protecting personal and organizational information within the specific organization affects their utilization and hence the overall organizational outcomes. From the foregoing findings, security of IS is a crucial aspect for performance of public agencies and there are lower levels of its appreciation among the public servants. Information security requirements are complex and need a holistic approach to mitigate the challenges of its adoption, utilization, and influence on performance in the public agencies.

The study finally deduces that Information storage has a significant impact on the performance of public agencies in Mombasa County. The various aspects of Information storage that play a crucial role in the performance of public agencies include data accessibility, data protection and data backup. Data storage increases operation where most of the activities are technology-based, hence requiring minimal supervision. The selection and adoption of highest quality storage devices, management tools, and efficient techniques is relevant and determines the performance in the public agencies.

The study sums up that IS adoption plays a significant role in the performance of public agencies. IS adoption being crucial for various aspects of performance in the public agencies. According to the findings Information flexibility contributes more to the increase of performance of public agencies followed by Information infrastructure, then Information storage while Information security contributes the least to the performance of public agencies.

The study recommends that since Information infrastructure plays a crucial role on the performance of public agencies in Mombasa, there

is need to enhance the Information infrastructure to ensure that it caters for its purpose in the organizations. This would include enhancing the IS interface, internet connectivity, IS hardware and IS software to support task completion time, cycle time performance as well as perceived usability and likability.

The study also recommended the relevant authorities in the public agencies to put special consideration on Information flexibility within the agencies. Here, the focus should be on data processing, versions upgrades and user acceptance of IS in the organizations. This will facilitate reliability, completion, accessibility, and understandability of information in a timely manner, hence leading to accelerated organizational processes, saving time, financial resources, reduction of staff, and enhancement of organizational workflow.

The study further recommended the management of public agencies to invest in secure information systems that can assure the staff privacy and protection. This calls for more emphasis on authentication, data protection and verification. For this to be achieved, there is need for top management support, Information security enforcement, training, and awareness creation as

well as creation of supportive organizational cultures in the public agencies.

The study finally suggests the need for improvement in Information storage through data protection, data backup, and data accessibility. This will further enhance information processing, analysis, decision making and action implementation within the agencies. This will also increase operation, enable information to be easily transmitted, enhance team performance, coordination and communication and data protection improves information quality and hence expanded organizational responsiveness.

Based on the summary, conclusions and recommendations, the researcher suggests that further studies should be done on influence of management information systems on performance of corporate institutions in Kenya. This will shade more light into the causes of variance in performance of public and other corporate institutions in Kenya. The researcher also suggests that a similar study be done in other organizations in other counties for comparison of findings and a general conclusion be drawn on the effects of management information systems on performance in the current era.

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