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EFFECT OF SYSTEM INFRASTRUCTURE ON PERFORMANCE OF TURKANA COUNTY GOVERNMENT, KENYA

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Abstract: **Integrated Financial Management Information System is characterized as the automation of the Public Expenditure Management process, which includes budget development, budget implementation, and accounting, facilitated by an entirely integrated financial management system for departmental ministries and other expenditure agencies. The intent of this research was to investigate the effect of system infrastructure on performance of Turkana County Government, Kenya. This study was done using a descriptive survey research design. The study targeted a population of 150 staffs in Turkana County Government comprising of ICT officers, accounting officers, accountants, senior procurement officers and assistant procurement officers. The sample size of 109 responders was used and it was determined using stratified random sampling technique. Source data was gathered through semi-structured questionnaires and analyzed utilizing descriptive, relational and inferential analysis. The findings were presented using tables. The findings indicated that system infrastructure significantly and positively influenced the performance of the Turkana County Government. The research concluded that a strong system infrastructure facilitates better communication among different departments and agencies within the county government. The study recommends that the County should invest in expanding internet access across the county, particularly in remote areas, to facilitate communication, data sharing, and access to online services.**

Keywords: **System Infrastructure, Integrated Financial Management Information System, Performance.**

1. INTRODUCTION

Integrated Financial Management Information System incorporates control mechanisms intended to aid management in guaranteeing responsibility in the allocation and utilization of public resources, hence improving the efficacy and efficiency of public expenditure programs. Enhanced control over spending, accountability, and transparency in the budget cycle are the outcomes of tracking financial events through automated financial management (Hendriks, 2018). The information society will yield beneficial impacts on the economy and society, according to several industrialized nations in Europe and beyond (Nitaya, 2019). Further, although referencing the Organization for Economic Cooperation and Development, information systems should support job creation, economic growth, increased production, and better quality of living. In order to achieve effective management of budgetary resources, the creation of an IFMIS has grown to be a significant standard for the budget reform agenda (Diamond & Khemani, 2018).

Globally, the development of information systems is intimately linked to globalization, wherein the ICT industry is increasingly integrated on a global scale. Several academics contend that ICT is a pivotal element in facilitating the globalization process within a particular setting, therefore influencing the intricacy of globalization (Turel, 2017). The Integrated Financial Management System (IFMIS) is an information system that monitors financial transactions and consolidates financial data. An IFMIS, in its fundamental essence, is primarily an accounting system tailored to function according to the requirements and specifications of its operating environment (Dorotinsky & Matsuda, 2021). IFMIS denotes the application of information and communications technology in financial operations to facilitate management and

budgetary choices, uphold fiduciary duties, and prepare financial reports and statements (Chuma, 2019). In the governmental context, IFMIS pertains specifically to the digitization of public financial management processes, encompassing budget preparation and execution, accounting, and reporting, facilitated by an integrated financial management system for line ministries, spending agencies, and other public sector operations.

The IFMIS has achieved success in the Slovak Republic. The primary catalyst for success was the political will, supported by a well delineated schedule and strategy. A comprehensive understanding of the government's requirements and those of other organizations emerged, providing explicit examples and a definitive delineation of the necessary tools to be utilized. The system was set up, tested, configured, and activated promptly at the commencement of the fiscal year (Goll, 2020). The outcome of this system, in its fundamental state, sufficed to recoup the initial capital within less than a year of operation. To evaluate the system's efficacy, a needs assessment was necessary. Establishing the duties of the new IFMIS for the country's Ministry of Finance was crucial, as it was also intended to service other government-related entities in a viable manner (Hutton, 2019). The system's requirements included: it must operate as a banking platform for all designated users, possess functionalities for budget management, transaction recording, and financial resource management, and utilize the IAS framework of accounting, currently IFRS (Holland, Sams & Kaplan, 2013). The Slovak IFMIS represented a significant accomplishment considering the prevailing political situation. The roll-out process experienced a governmental transition; however, it remained on course as the elected Assembly (Parliament) was dedicated to the new system and compelled the bureaucracy to comply (Dorotinsky, 2018).

Regionally, Diamond and Khemani (2018) observed that in most emerging economies, budget execution and accounting procedures were either discretionary or reliant on outdated and poorly maintained software tools. They stated that this has adversely affected the operation of their public expenditure management (PEM) systems, leading to an absence of accurate and punctual revenue and expenditure data for budget preparation, surveillance, expenditure control, and reporting, which has adversely affected budget management and resulted in inadequate oversight of government resource commitments (Mbuti, 2019). This frequently resulted in significant arrears accumulation, excessive borrowing that elevated interest rates and displaced private sector investment, as well as resource misallocation, so compromising the efficacy and efficiency of service delivery.

Governments in emerging economies are progressively investigating strategies and frameworks to enhance and modernize public financial management. Over the years, the IFMIS has been implemented as a prevalent financial management reform, designed to enhance efficiency, effectiveness, accountability, transparency, data security, and comprehensive financial reporting. The scope and functionality of IFMIS differ amongst nations, although it typically signifies a substantial, intricate, strategic reform initiative (Chêne 2020).

Locally, the IFMIS in Kenya was initiated by the former Ministry of Finance and the current National Treasury in 1998, with trial implementation occurring in line ministries in 2017. The system was software based on Oracle and implemented across all enterprises. This system consolidated accounting functions using a centralized database, accessible to authorized users through a highly secure network. The Oracle-based IFMIS introduced in 2017 had several modules, including budgeting, procurement, buy ordering, accounts payable and receivable, cash management, general ledger (GL), and commitment management. Two additional analysis tools introduced include the Oracle Financial Analyzer and the financial statements generator. Numerous modifications were implemented to align the system with governmental procedures. In 2011, the Ministry of Finance initiated an assertive re-engineering effort aimed at transforming the IFMIS from a modular system to a comprehensive end-to-end process.

Prior to the implementation of IFMIS, governmental financial management practices were typically marked by several financial difficulties and deficiencies. This encompassed the absence of consistent, timely, and pertinent financial information for diverse decision-making processes. The financial management tasks were marked by the utilization of labor-intensive or semi-automated processes for financial planning, budget estimation, procurement, payment processing, record-keeping, reporting, and information storage, which lacked efficient retrieval capabilities. IFMIS is completely functional across all Ministries, Departments, Agencies (MDAs), and all 47 County Governments. The primary aim was to enhance the comprehensive accounting and financial operations inside the MDAs and County governments. Government agencies primarily consist of commissions and other semi- autonomous entities tasked with the oversight and administration of specific functions, including tax collection auditing, intelligence, teacher services, public service, and various governmental expenditure agencies.

Performance measures how well both short- and long-term goals are being met or have been achieved. It involves calculating both monetary and non-monetary outcomes of a firm's operations and policies. This metric evaluates a company's overall health over a specified timeframe and can also facilitate comparisons among comparable firms within the same industry or across aggregated industries or sectors Wang and Chung (2017). Performance, in a larger meaning, relates to how well a task was completed in relation to predetermined accuracy, completeness, cost, and speed standards. It delineates the level at which an accomplishment is executed or has been finalized (Kiilu, 2014).

IFMIS is an automated system for Public Expenditure Management that encompasses budget development, budget execution, and accounting, utilizing an entirely integrated financial management system for line ministries and other expenditure agencies. IFMIS facilitates public financial management and control, accounting, auditing, and reporting. A comprehensive system ensures integration and connectivity with other pertinent information systems (Diamond & Khemani, 2018). IFMIS are implemented to automate and digitize diverse facets of budget execution and accounting processes inside governmental entities (Casals, 2018). The system is underpinned by a dependable database or a network of interconnected databases, facilitating the bidirectional flow of financial data (Njonde & Kimanzi, 2019).

Following the initiation of County Governments as well as voting of governors, they commenced building their aptitude to provide the amenities as postulated in the constitution to their citizens. County governments partially draw their coffers from the central government as well as the local revenue assortment (Ndzovu & Ng'ang'a, 2019). To guarantee transparency, culpability, impartiality as well as efficacy, in 2014, the national government commenced the use of IFMIS scheme into counties. Subsequent to the establishment of county governments by the 2010 constitution, the National Treasury initiated the deployment of IFMIS across all counties in 2013 (Cherotich & Okibo, 2020).

Prior to the implementation of IFMIS, governmental financial management practices were typically marked by several financial difficulties and deficiencies. This encompassed an absence of predictable, promptly, and pertinent financial information for diverse decision-making processes (Mobegi, 2015). The financial management tasks were marked by the reliance on manual or semi-computerized processes, including laborious financial planning, budget estimation, procurement, payment processing, vote book maintenance, and reporting, all of which hindered efficient information retrieval.

2. STATEMENT OF THE PROBLEM

The IFMIS is a sub-system of information systems that provides comprehensive historical, current, and prospective financial data pertaining to an organization, presenting this information to both internal and external stakeholders (Pimenta & Seco, 2019). The optimal integration of robust IFMIS systems with centralized treasury operations can facilitate effective financial control, promote transparency and accountability, diminish political discretion, and serve as a disincentive to corruption and fraud. IFMIS aims to bolster the trustworthiness and reliability of financial reports by increasing the comprehensiveness and openness of information (Chalu, 2020).

Public institutions struggle despite having operational information systems in place (Agrawal and Nyamful, 2016). Inconsistency in performance of government institutions is due to inflexibility of adoption of information system (Yousefi, 2016). Emerging economies have been urged to reform their public expenditure information systems due to inadequate information security, which has impeded openness and accountability. Consequently, industrialized nations have initiated significant projects, such as the computerization of government operations.

Measures have been implemented to enhance public service delivery, such as the automation of numerous government services. The Kenya Vision 2030 envisions public service as a "citizen-focused and purposeful" institution catering to a swiftly expanding economy and society. Kwena (2016) asserts that Kenya acknowledges that a contemporary and results-oriented public service is essential for the nation's socio-economic transformation as outlined in Kenya Vision 2030. To this far, automation of a good number of public service delivery have been initiated.

Training, costs, infrastructure and regulations are factors that have affected the implementation of management information systems, this is as per the Munenen, Namusonge and Iravo's 2014 study on specific financial cooperatives in Nairobi. Miheso (2015) examined the implementation of the IFMIS by the National Government of Kenya. The research demonstrated that, on average, adoption exceeded 50%, with some instances reaching as high as 80%. Initially, the implementation was executed accurately in certain institutions, such as the Central Bank; however, it has not achieved significant success in the ministries and has failed to meet most of the intended goals. In Kenya's public sector, County

government entities exhibit inadequate performance, necessitating the implementation of information systems. The county government entities encounter obstacles that compel them to modify or alter their standard operational procedures. This is due to poor infrastructure development, information and data security structure, system data storage and information systems management among other challenges. This study therefore sought to investigate the capabilities and performance of IFMIS integration in Turkana County Government. The research indicated that the average adoption rate exceeded 55%, with some instances reaching as high as 85%. The Central Bank of Kenya is one institution that has implemented it correctly; nevertheless, it has not achieved success in the ministries and counties due to their failure to meet the desired aims. In Kenya's public sector, numerous MDAs and counties exhibit subpar performance, necessitating an examination of the capabilities and effectiveness of the IFMIS. The Turkana County Government encounters issues that necessitate alterations to its conventional operational methods. This results from inadequate system infrastructure, ineffective information storage, insufficient managerial commitment, and inadequate data security, amongst other difficulties. This research, thus, sought to ascertain the relationship between integrated financial management information system capabilities and performance in Turkana County Government, Kenya.

3. LITERATURE REVIEW

Theoretical Literature Review

System Theory

General systems theory (GST) was initially proposed by Ludwig von Bertalanffy in 1940, but it did not achieve significant recognition until the 1960s. GST primarily focuses on the operational mechanisms of systems, integrating a diverse array of systems by recognizing and delineating patterns and processes that are universally applicable. Through the application of this comprehensive nomenclature, GST seeks to elucidate the genesis, stability, and evolution of all systems (Alter, 2018). A system has several interrelated and cooperative systems that collaborate to achieve a defined set of objectives (Kang'ethe, 2021). Control systems ensure that the process achieves optimal productivity while minimizing waste. The HR is the fundamental element that activates the other resources, ensuring efficacy and efficiency. Various operational modalities, especially contemporary ICT, facilitate the achievement of office secretarial management aims.

Emerging ICT is crucial in mitigating corruption within public finance systems by fostering comprehensive, clear, and transparent information dissemination across administrative agencies. Hence, the implementation of IFMIS has been identified as a crucial element of public financial reforms in numerous developing nations. The theory is pertinent as it connects to the implementation of diverse organizational systems to attain efficiency, with technology being one of the specified systems. The IFMIS system consists of various mechanisms that operate independently to ensure effective financial management and cash management within the county administration. The elements of the IFMIS system impact cash management and constitute surrogate variables utilized in cash management for operational success at the organizational level.

Critics of systems theory contend that it offers less direct direction regarding which elements of the systems in question should be altered to attain policy objectives. Systems theory seems inadequate in addressing situations where system members are in conflict or significantly unequal in power and resources (Stewart & Ayres, 2019). Systems theory examines the interactions of input, throughput, and production timeliness, necessitating the coordination and integration of purpose, personnel, structure, techniques, and information to optimize organizational value (Montouri, 2020).

Empirical Literature Review

Much of the Information Systems (IS) research regards IT as a construct of infrastructure flexibility, encompassing connectivity, compatibility, modularity, and the competency of IT professionals. Chanopas et al. (2016) augmented the construct by incorporating five more elements: scalability, regularity, velocity, facility, and modernity. Indeed, as there is no research substantiating Chanopas et al.'s (2016) paper, which was the inaugural description of a novel paradigm representing IT infrastructure flexibility.

Papp (2015) elucidates that IT infrastructure comprises IT architecture, processes, and competencies. The architecture of IFMIS comprises software, hardware, networks, data, applications, and data management utilized by an organization to support its information systems and business strategies. The system infrastructure comprises two primary aspects: technological infrastructure and human infrastructure. The collective system infrastructure resources encompass a technical

foundation of hardware, software, communication technologies, data, and essential applications, with human elements of skills, expertise, competencies, and values (Byrd and Turner, 2015).

The system infrastructure is a critical capability of the IFMIS that dictates the level to which the government can deploy essential technologies to enhance its performance. The impact of system infrastructure on technology adoption and organizational success in Canada was evaluated by Chaudhuri, Subramanian, and Dora in 2022. Their research employed a descriptive design and studied SMEs within the service sector in Canada. Their findings suggested that system infrastructure, including ICT hardware and software, was crucial for companies to adopt key technologies that significantly influenced their performance. Sapura, Sasanti, Alamsjah, and Sadeli (2022) indicated that essential system infrastructure, such as the internet and computers, provides firms with a stronger foundation to deploy innovations that improve their performance.

The system infrastructure influences an organization's capacity to incorporate digital technology in managing operations and sustaining performance, as indicated by Heredia, Castillo-Vergara, Geldes, Gamara, and Herdia (2022) in their study on the assessment of system infrastructure's role as a digital capability in improving firm performance. They conducted an enterprise survey that garnered 999 replies from 27 countries. Herdia et al. (2022) characterize system capabilities by the level to which an organization integrates critical inputs that facilitate successful digital utilization in its operations, with system infrastructure being one of these inputs.

Ogiri (2020) studied the impact of system infrastructure on the performance of telecommunications firms in Nigeria. The research evaluated the impact of essential system infrastructure, including ICT software, ICT hardware, and internet connectivity, on the efficacy of digitalization in improving organizational performance. Their study employed a cross-sectional research design and included a total sample of 216 respondents. The results indicated that concentrating on system infrastructure improved the efficacy of Information Systems in the firm. Ogiri (2020) asserts that system infrastructure, including ICT software and hardware, is crucial for the execution of fundamental IFMIS initiatives designed to improve organizational efficiency, hence driving competitiveness and success. The author further asserts that for telecommunication companies, network coverage is a crucial infrastructural component that substantially enhances industry performance by facilitating widespread network access. Cenamor, Parida, and Wincent (2019) assert that digital infrastructure initiates the extensive journey of integrating ICT into business processes, hence sustaining performance.

One of the efforts of national treasury is to improve county governments unit's performance is to invest in improving the infrastructure of IFMIS. The correlation between IFMIS investment and the enhancement of county government units should be assessed. Numerous organizations failed to recognize that system infrastructure encompasses more than merely hardware and software that require assessment. System infrastructure include human resources, as well as the administration of software and hardware (Schniederjans, et al, 2014). The absence of a thorough review of the system infrastructure leads to the presumption that it bears no direct correlation with firm performance. Yongmei, Hongjan and Junhua (2018) and Gupta, Raychaudhuri, and Haldar (2018) observed that certain components of system infrastructure can directly influence corporate performance, while certain system investments may exert an indirect effect.

Mutiso and Mutuku (2020) studied the effect of information systems on user performance in Machakos County, Kenya, using descriptive and explanatory designs. The research targeted 464 employees, with a sample of 215 respondents. Primary data was collected through a questionnaire featuring open and closed questions, and analyzed using SPSS. Descriptive analysis included means, frequency distributions, and percentages, while inferential analysis utilized correlation and multiple regression. Results showed that information systems positively impacted user performance, which in turn enhanced organizational performance, as they provide high-quality information that reduces errors and resolves performance issues.

4. RESEARCH METHODOLOGY

This study was done using a descriptive survey research design. The study targeted a population of 150 staffs in Turkana County Government comprising of ICT officers, accounting officers, accountants, senior procurement officers and assistant procurement officers. The sample size of 109 responders was used and it was determined using stratified random sampling technique. Source data was gathered through semi-structured questionnaires and analyzed utilizing descriptive, relational and inferential analysis. The findings were presented using tables.

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5. FINDINGS

The descriptive statistics results on system infrastructure are presented in Table 1.

Table 1: System Infrastructure

Statements	SD (%)	D(%)	N(%)	A(%)	SA(%)	M	SD
There's adequate hardware, software and internet for use in the operation in Turkana County Government	15.2	6.1	2	46.4	30.3	4.25	0.756
The available hardware and software is up to date for efficiency and effective use	6	0	0	0	52.5	4.46	0.539
The available software and hardware infrastructure is up-to-date to run the digital processes in the Government	0	10.1	0	38.4	51.5	4.56	0.438
The available software and hardware infrastructure is up-to-date to run the digital processes in the Government	10.1	5.1	3	34.3	47.5	3.68	1.318
Aggregate score						**4.24**	**0.763**

The mean score of 4.24 indicates strong agreement amongst responders on the impact of system infrastructure on the performance of the Turkana County Government in Kenya. This score, above the midpoint of a Likert scale, shows that most participants view system infrastructure as crucial for effective government operations. The std. dev. of 0.763 suggests low variability in responses, indicating a consensus on the importance of system infrastructure. This reinforces the idea that there is widespread recognition of its role in enhancing governmental performance. The findings concur with Papp (2015) elucidates that IT infrastructure comprises IT architecture, processes, and competencies. The architecture of IFMIS comprises software, hardware, networks, data, applications, and data management utilized by an organization to support its information systems and business strategies. The system infrastructure comprises two primary components: technological infrastructure and human infrastructure. The collective system infrastructure resources comprise a technical foundation of hardware, software, communication technologies, data, and essential applications, together with a human element comprising skills, expertise, competencies, and values (Byrd and Turner, 2015).

Inferential Statistics Results

Table 2: Correlation Analysis

		System infrastructure	Performance
System infrastructure	Pearson Corr.	1	
	Sig.(2-tailed)		
	N	99	
Performance	Pearson Corr.	.803*	1
	Sig. (2-tailed)	.001	
	N	99	99

The Pearson correlation coefficient of 0.803 for system infrastructure indicates a robust favorable link with the functioning of the Turkana County Government. This indicates that as the quality and robustness of the system infrastructure improve, the overall performance of the government is likely to enhance significantly. This could imply that investments in technology and infrastructure are crucial for improving governmental efficiency and service delivery.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.933	0.870	0.851	0.0096

The adjusted R square value of 0.851(85.1%) confirms the model's strength, indicating that a substantial portion of performance variance is still explained after accounting for the number of predictors. Therefore, the remaining (14.9%) accounts for other capabilities not studied. This underscores the model's statistical significance and practical relevance.

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.596	0.227		2.6256	0.003
	System infrastructure	0.771	0.308	0.0656	2.5032	0.002

The research findings elucidate critical aspects influencing the success of the Turkana County Government in Kenya, with beta values denoting the intensity and direction of these associations as articulated; the findings are elaborated as follows; System Infrastructure (Beta = 0.0656, Significance = 0.002): Although the low beta value suggests a weaker influence on performance, the significant value of 0.002 indicates that improvements in system infrastructure can still enhance government performance, emphasizing the need for investment in technological frameworks. The finding aligns with the research of Cenamor, Parida, and Wincent (2019), which demonstrated that digital infrastructure initiates the extensive journey of integrating ICT into organizational processes that sustain profitability.

6. CONCLUSIONS

The study concludes that a strong system infrastructure facilitates better communication among different departments and agencies within the county government. This leads to improved coordination in service delivery and project implementation. The establishment of centralized databases allows for efficient data collection, storage, and retrieval. This ensures that decision-makers have access to accurate and up-to-date information. Automation of routine tasks reduces the time and effort required for service delivery, allowing government employees to focus on more complex issues that require human intervention. The implementation of new technologies and systems often comes with training programs for government staff, enhancing their skills and capacity to perform their duties effectively.

7. RECOMMENDATIONS

The study recommends that the County should invest in expanding internet access across the county, particularly in remote areas, to facilitate communication, data sharing, and access to online services. Conduct regular training sessions for government employees on the use of new technologies and systems to ensure they are equipped to utilize the infrastructure effectively. Develop integrated e-government platforms that streamline service delivery, allowing citizens to access multiple services through a single portal. Partner with technology firms to leverage their expertise in developing and maintaining infrastructure, ensuring sustainability and innovation.

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