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TECHNOLOGICAL INFRASTRUCTURE AS A MODERATOR OF THE PUBLIC FINANCIAL MANAGEMENT–OWN-SOURCE REVENUE RELATIONSHIP IN KENYA'S COUNTIES

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ABSTRACT
This study aimed to examine the moderating effect of technological infrastructure on the relationship between public financial management practices and own-source revenue by county governments in Kenya. The New Public Management theory served as the anchor theory supported by Technology Acceptance Model and Public Choice theory. Utilizing a positivism research paradigm and a descriptive design, the study analyzed the 11 best-performing counties for revenue generation in the 2022/2023 financial year. A sample of 284 county officials was selected through stratified random sampling, with data collected via structured questionnaires. The research revealed that technological infrastructure significantly moderates the relationship between public financial management practices and own-source revenue in Kenya's county governments. The study concludes that public financial management (PFM) practices are strong predictors of own-source revenue (OSR), but their impact is significantly moderated by technological infrastructure: adding technology to the model improves its explanatory power, indicating robust systems amplify PFM's positive effects on revenue. However, current technological setups appear misaligned with PFM needs, revealing a complex interplay and a performance gap. To optimize revenue outcomes, counties should invest in, assess, and align technological capabilities with revenue-generation goals while simultaneously strengthening PFM practices. The study recommends that county governments prioritize upgrading and integrating technological systems particularly IFMIS and mobile payment platforms and invest in staff training to ensure effective use of these tools. Strengthening technological infrastructure will enhance efficiency and transparency in revenue collection; optimize public financial management, and significantly increase own-source revenue, ultimately supporting better public services and community development.

KEYWORDS: *Own-source revenue, Public financial management practices, Technological infrastructure, County governments in Kenya*

I. INTRODUCTION

In Kenya, the County Government Act 2012 and the Public Finance Management Act 2012 guide local resource mobilization. Furthermore, the National policy on own-source revenue also guides revenue administration at the county level (Un-Habitat, 2014). According to the Un-Habitat, the county government's own-source revenue accounts for 14 per cent of total receipts. However, the policy described this contribution as inadequate, hence the over-reliance on equity share from the national government (Ngicuru, 2017; Githinji et al., 2018). Thus, the Constitution of Kenya, 2010 (in conjunction with the 2012 Public Finance Management Act, the County Government Act of 2012 and the 2011 Urban Areas and Cities Act 2011), ushered in a decentralized system of governance comprising of a National Government and forty-seven (47) County Governments, replacing a centralized system of governance. The system features significant political and administrative devolution, in addition to fiscal decentralization in which County Governments are granted responsibility for raising revenue as well as budgeting for devolved functions. Local and regional governments play a crucial role in both public finance and citizens' welfare (Constitution of Kenya, 2010).

The primary objective of Public financial management practices is to maximise profitability for investors and company owners, whereas the main objective of public financial management is to efficiently provide services to people and optimise the use of public resources. Therefore, public financial management strategies focus on establishing overall fiscal discipline, efficient allocation of resources, fairness, redistribution of wealth, and obtaining value for money in an open and responsible way. Therefore, it is crucial to comprehend how different PFM duties align with a comprehensive set of laws and regulations that oversee the administration of public resources, and the final objectives that these functions aim to accomplish together (Adekoya, 2023). Muhammed

Ahamed (2018) conducted a critical analysis of Public Financial Management Practices in Ethiopia and Tanzania. The study showed that both the Ethiopian and Tanzanian reforms have been successful. Both pathways were selective and focused on systematically addressing key weaknesses in financial control. The first order task was to instill effective control while the second order task was to improve the efficiency of control. Both involved extensive customization. In comparing the two countries' public financial management reform, actions of Ethiopian reform have been the following: evolve existing systems, hybrid approach, focus on legal framework, budget, accounts, reporting, automation replicates, strong manual controls over commitments, procurement, disbursement and sequencing. On the other hand, the Tanzanian PFM was based on reform actions driven by installing new Information Technology, procedures and discipline.

Automation plays a crucial role in increasing income by improving efficiency and preventing leakages. According to data from the Controller of Budget and CRA (2022), most counties use fragmented ICT systems for revenue collection and administration, such as LAIFOMS and IFMIS. Without integration, they were unable to develop standardised reports for monitoring and supervision. County governments for example Nairobi, Kisumu, Mombasa, Nakuru and Machakos may be leading the way in automation and electronic payment systems. In early 2016, the media reported that 31% of payments for services, including land rates, SBP, parking fees, and market rates, were made using the Jambo Pay platform by Nairobi County government. By the end of 2016, this is anticipated to have reached 50% or higher. Nairobi is presently developing an electronic platform for building permits (e-CP). Despite the improvement in automation, the revenue collection system remained incompletely connected. System fragmentation may result in income being utilised at the source, as reported by the Controller of Budget, and is often vulnerable to leakages.

Enhancing the own source revenue (OSR) not only boosts the total income for a county government but also enhances the financial independence for the county governments and enables them to more effectively handle their public finances in a way that aligns with their own economies (IMF, 2018). County-owned resource mobilisation empowers counties to exert authority over their development priorities and enhances the opportunity for county authorities to be held politically and administratively accountable to their voters (Abdille, 2022). Most countries in Africa struggle to meet their revenue collection targets due to weak systems and structures (ACR, 2016). For example, the mobilization of local government revenue in countries like Rwanda and South Africa was found to be hampered by poorly defined tax bases, the absence of tax handles, inadequate local government tax enforcement mechanisms, discretionary transfer system, perceived corruption, poor administration and limited accountability (Wawire, 2020; IMF, 2019). Studies further revealed that own-source revenue mobilization in East African countries was impeded by the general absence of voluntary compliance among taxpayers, weak relationships between tax policy and national development objectives, and difficulties with tax administration (Wawire, 2020; IMF, 2019).

Article 202 of the constitution of Kenya, provides that revenue raised nationally shall be shared equitably among the national government and the county governments. Further, Article 203 of the Constitution stipulates that for every financial year, the equitable share of the revenue raised nationally that is allocated to county governments shall not be less than 15% of all revenue collected by the national government and that the amount shall be calculated on the basis of the most recent audited accounts of revenue received, as approved by the national assembly. Each county government's equitable share of revenue raised nationally, is determined yearly through the county allocation of revenue act (CARA). The revenue sharing formula is developed by the commission on revenue allocation (CRA) and approved by the parliament in accordance with Article 217 of the constitution. The CARA for the FY 2022/23 allocated county governments' equitable share of Kshs 370 Billion, which was the same as the CARA allocation in FY 2021/2022. The county government are mandated to generate own source revenues from property rates, entertainment taxes, levies, user fees and licenses and any other taxes that may be authorised to impose within the relevant legislation. County own source revenue increased from Kshs 32.8 Billion of FY 2021/22 to Kshs 36.9 Billion in FY 2022/23 (12%).

1. Statement of the Problem

The According to a report by Commission on Revenue Allocation (2023), it indicated that out of forty-seven (47) counties in Kenya only Eleven (11) counties can finance more than 10% of their overall budget which implies that most of the county governments finance close to 90% of their budgets through National Government transfers to county governments (CRA, 2023). Many counties collect less own source revenue than their potential, which is unsustainable and prevents them from meeting their growing expenditures (CRA, 2023). County own source revenue stood at 8% from own sources such as fees, licenses, levies, cess, business permits and property income during FY 2022/23 compared with 9% of total receipts in FY 2021/22 (CRA, 2023). Today, most county governments have not been able to mobilize resources effectively resulting to under development and poor service

delivery that do not meet citizens‟ expectations, with key services such as health care, water, sanitation, education, and agricultural extension services remaining dismal (Kimutai, 2017).

The 2022–2023 report from the National Treasury identifies various obstacles to generating revenue within Kenyan counties. Some of these problems are; unclear ways to predict revenue, old valuation rolls, bad structures for managing revenue, interference from political groups, the lack of tariff and pricing policies, and not enough resources for the public to be involved in legislative processes (National Treasury & Planning, 2024). Therefore, there was need to undertake the study on public finance management practices, technological infrastructure, and the own-sources of revenue used by county governments in Kenya.

1.1 Research Specific Objectives

(i) To assess the moderating effect of technological infrastructure on the relationship between public financial management practices and own-source revenue by county governments in Kenya.

II.LITERATURE REVIEW

2.1 The New Public Management (NPM) Theory

New Public Management (NPM) Theory was advanced by Christopher Hood (1991). The Theory presents a set of administrative policies which dominated the civil service reform agenda in many Organisations for Economic Co-operation and Development (OECD), countries. This term was first introduced by academics in the UK and Australia to describe the approach developed during the 1980s, as part of an effort to make public services more straight forward and to improve its efficiency by using a private sector management model. New Public Management (NPM) is generally seen as an approach in public administration that applies knowledge and experience gained in the world of management and other disciplines to improve the efficiency and effectiveness of public service performance in modern bureaucracies (Indahsari & Raharja, 2020).

The New Public Management (NPM) Theory postulates seven principles to govern the NPM approach to organisational management. These include adoption of private sector-style of management practices which is business-like, development of a strategic plan with clear outline of the vision, strategic objectives and activities, formulation of a strong policy framework to guide the implementation of the strategy, development of a strong monitoring and control system to ensure effective implementation of the strategy, establishment of proper performance management system to facilitate effective measurement of performance results against the predetermined outcomes, a shift from a centralized system of governance to a decentralized structure of governance which will ensure increased flexibility and eliminate bureaucratic bottlenecks, and an emphasis on performance-based assessment of outsourced goods and services exercise greater fiscal discipline on the use of public resources to effects and efficiency in providing public service to the citizens (Indahsari & Raharja, 2020).

2.2 Technology Acceptance Model (TAM)

The adoption and utilization of information technologies can provide both immediate and long-term advantages at both organizational and individual levels. These benefits include enhanced performance, improved financial and time efficiency, and greater convenience (Foley Curley, 1984). This potential for technology to deliver value has driven research in information systems (IS) management to explore the factors influencing individuals' willingness to embrace innovative technologies (Davis, 1989). The study of technology adoption gained prominence during the 1980s, coinciding with the rise of personal computers. However, a significant challenge in advancing research on personal computing adoption was the lack of empirical insights into how users responded to the performance of information systems. Prior to the development of the Technology Acceptance Model (TAM), various technological and organizational approaches were employed to advance IS research (Benbasat, Dexter & Todd, 1986; Robey & Farrow, 1982; Franz & Robey, 1986). For instance, earlier studies emphasized the importance of involving users in the design and implementation of information systems, while another research stream focused on evaluating and refining system design and features (Gould & Lewis, 1985; Good et al., 1986).

The Technology Acceptance Model (TAM) was used in this study to understand individual user acceptance of technology, considering factors like perceived usefulness and ease of use. The model provides insights into how technology infrastructure is perceived and adopted by government officials and citizens, influencing its impact on the OSRC. The study hypothesized that the constructs and associations described in the modified external variable of TAM model are valid to measure behavioral intention to use technology by county governments in Kenya. Technological infrastructure (TI) refers to the foundation of an IT service in an organization, including computer hardware, software, networks, and people. Although not part of the TAM constructs, facilitating conditions influence users' attitude and intention to use technology. The study focused on technological infrastructure

dimensions such as automation of revenue collection, mobile payments systems, online response processes, and integrated tax management systems.

2.3 Public Choice Theory

The Public choice theory is a branch of economics that developed from the study of taxation and public spending. It emerged in the fifties and received widespread public attention in 1986, when James Buchanan, one of its two leading architects (the other was his colleague Gordon Tullock), was awarded the Nobel Prize in economics (Mueller, 2019). As early as 1651, English philosopher Thomas Hobbes laid the groundwork for what would develop into public choice theory when he argued that the justification for a political obligation is that since people are naturally self-interested, yet rational, they will choose to submit to the authority of a sovereign government to be able to live in a stable civil society, which is more likely to allow them to fulfill their interests (Hobbes, 1651). The influential eighteenth-century German philosopher Immanuel Kant wrote that for any action to have moral worth, it must be undertaken out of a sense of duty. According to Kant, actions taken out of self-interest—selfish benevolence—simply because they make the individuals taking them "feel good" about themselves, preclude the possibility of those actions having any moral value (Kant, 1785).

Public choice takes the same principles that economists use to analyze people's actions in the marketplace and applies them to people's actions in collective decision making. Economists who study behavior in the private marketplace assume that people are motivated mainly by self-interest. Although most people base some of their actions on their concern for others, the dominant motive in people's actions in the marketplace—whether they are employers, employees, or consumers—is a concern for themselves. Public choice economists make the same assumption—that although people acting in the political marketplace have some concern for others, their main motive, whether they are voters, politicians, lobbyists, or bureaucrats, is self-interest. In Buchanan's words the theory "replaces... romantic and illusory...notions about the workings of governments [with]... notions that embody more skepticism" (Buchanan, 1986).

The relevance of Public Choice Theory in this study lies in its ability to provide a theoretical framework to understand and explain the decision-making processes of county governments in Kenya. By considering the rational behavior and self-interest of individuals, as well as the role of institutions and collective action, the theory can help identify the factors that influence public financial management practices, governance frameworks, technological infrastructure, and own source revenue generation. This understanding can inform policymakers and stakeholders in developing more effective strategies and policies to enhance public financial management and governance practices at the county level in Kenya.

2.4 Public financial management practice and own-source revenue collection

A study Laban, Muchiri, and Muthinja (2023) examined how four forms of digital automation—automated revenue systems, mobile-payment platforms, online service-response processes, and integrated tax-management systems—shape own-source revenue (OSR) in Nyandarua County, Kenya. Drawing on Resource-Based View and Transaction Cost Theory, the researchers surveyed 52 finance and ICT personnel and analysed questionnaire responses alongside county financial records with SPSS. Multivariate regression produced an adjusted R^2 of 0.849, indicating that automation explains nearly 85 percent of the variance in OSR. Among the individual predictors, mobile payments ($\beta = .538$, $p = .005$), online response processes ($\beta = .239$, $p = .042$), and integrated tax systems ($\beta = .282$, $p = .019$) all exerted significant positive effects. The authors concluded that digitising revenue operations materially boosts county income and urged other counties to pursue similar technologies, while noting that the single-county focus limits generalisability. Building on this work, the present study will test how technological infrastructure influences OSR across eleven Kenyan county governments.

A study conducted by Munguti, G. M. (2022) explored ways to enhance own source revenue in Machakos. This correlational research involved 286 participants and utilized questionnaires for data collection. The analysis was performed using Statistical Package for Social Sciences (SPSS) version 23, employing descriptive statistics to identify revenue streams and challenges, while correlational tests and binary logistic regression were used to evaluate three research hypotheses. The results indicated that property tax was the most effective revenue stream, accounting for 25.6%. The primary challenge identified was the lack of experienced and qualified staff, which was noted by 13.9% of participants. Additionally, participants generally disagreed with the challenge statements, showing minimal variability in their responses ($M = 3.07$, $Mdn = 3.08$, $SD = .82$). The study also found significant correlations between revenue mobilization and factors such as automation ($r = .64$, $p = .00$), human resource training ($r = .53$, $p = .00$), and enforcement ($r = .52$, $p = .00$). Regression analysis revealed that both automation ($p = 0.00$) and enforcement ($p = .01$) were statistically significant, while human resource training ($p = .33$) was not. These findings suggest that Machakos has the potential to improve its own source revenue. The county is

encouraged to optimize its revenue streams, develop strategies to address challenges, automate revenue collection systems, and enforce taxable transactions effectively. The current study will examine the effect of technological infrastructure on own-source revenue by 11 county governments in Kenya.

A study conducted by Ringim, Razalli, and Hasnan (2019) explored the moderating effects of information technology (IT) capability on the relationship between business process reengineering (BPR) factors and the organizational performance of banks in Nigeria. The research utilized a field study survey conducted in a natural research environment, gathering data from commercial banks, microfinance banks, and primary mortgage financial institutions across the country. Hierarchical regression analysis was employed for data analysis using SPSS software. The results indicated that IT capability significantly moderated the relationship between various BPR factors—such as change management, customer focus, and management commitment—and the overall performance of the banks. Additionally, the findings highlighted that IT capability also influenced the relationship between IT investment, management commitment, and customer service management performance. This study offers valuable insights for researchers seeking to deepen their understanding of how BPR factors and IT capability impact organizational performance.

III. RESEARCH DESIGN AND METHODOLOGY

3.1 Research Philosophy

This study used positivist philosophy to effectively accomplish its aims. Positivism was the most appropriate technique for this research due to the following reasons: the study was hypothesis-driven, and this methodology aligned well with the principles of positivism. The study used survey methodology to effectively reach a diverse and geographically dispersed population. Positivism is suitable for assessing the reactions of a substantial number of subjects, namely the chosen county government officials, who serve as officials and representatives of the broader population of county government management. The study used quantitative methods for collecting and analysing data (Saunders et al., 2014).

3.2 Research Design

Research design, as defined by Rubi and Babbie (2011), is the systematic arrangement of frameworks to establish causal relationships in quantitative research. This study adopts a cross-sectional survey design, ideal for determining the prevalence of a phenomenon at a specific point in time (Kumar, 2014). This approach efficiently collects data from a large sample using a single questionnaire, ensuring consistency and reducing bias (Bhattacherjee, 2012). This study aims to determine the effect of strategic leadership, digital transformation, government regulations, and insurance penetration in Kenya. The cross-sectional survey design will provide insights into the prevalence of these factors and their associations, informing future research and recommendations. Focusing on a single organisation, the cross-sectional approach will examine multiple variables simultaneously. By administering a structured questionnaire to key stakeholders within the insurance industry, data will be collected on strategic leadership, digital transformation, government regulations, and insurance penetration, revealing their prevalence, associations, and potential impacts.

3.3 Target Population

Population refers to a group of individuals, objects, or cases with observable features from which the researcher generalizes the study findings (Bhattacherjee, 2012). The unit of analysis in study was the eleven (11) county governments in Kenya and was drawn from the Auditor General report (GoK, 2023) as presented in Table 3. The target population was 983 county officials that consisted of 884 accounting officers and 99 directors from county treasuries in 11 counties: Nairobi, Mombasa, Kisumu, Kiambu, Nakuru, Narok, Machakos, Kakamega, Laikipia, Uasin Gishu, and Meru County. These were the top eleven counties in local revenue collection during 2022/2023 financial year as per the report of the Office of Controller of Budget.

3.4 Sample Frame and Sampling Technique

According to Kothari (2004), it defines a sampling frame as a list of population from which a sample is drawn. It is the source material or device from which list of all elements within a population that can be sampled is drawn and may include individuals, households or institutions. It's a published list with a set of directions for identifying a population (Zikmund et al., 2013). A sampling frame facilitates formation of a sampling unit that refers to one member of a set of entities being studied which is the material source of the random variable (Bailey, 2008). For this study, the sampling frame was drawn from the lists of accounting officers and directors in county treasuries obtained from the human resource departments of the respective county governments.

A sample is a subsection of the target population used in a study to represent the entire population (Fowler and Lapp, 2019). Quantitative studies typically use probability sampling, while qualitative studies often use non-

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probability techniques. The sample size is the number of individuals or units included in a study, chosen based on the study's objectives, population makeup, accuracy level, anticipated reaction rate, number of variables, and whether it's a quantitative or qualitative study. For this study, the sample size of the study was determined using Yamane (1967) formula, as follows.

$$n = \frac{N}{1+Ne^2}$$

Where: *n* is the sample size; *N* is the population size - 983; *e* is the margin error – 5%. Thus, n= $\frac{983}{1+983(0.05)^2}$ = **284.31 = 284**

The final sample size of the study comprised of 284 participants

Stratified proportionate random sampling was employed to select the respondents for each county from the four categories (stratas) of county respondents for this study. The four categories (stratas) are the County Assembly, County Public Service Board, Chief Officers and County Directors. Stratified sampling divides the population into subgroups that are more homogeneous than the entire population (Creswell, 2014). The subgroups are also called strata and selection is normally undertaken from each individual stratum (Creswell, 2014). Proportionate sampling was used to proportionally allocate specific number of participants in each county and then apply random sampling to select 284 county respondents proportionally allocated in each category from the eleven (11) counties who participated in the study.

3.5 Data Collection Instruments and procedures

Data collection is a process of gathering specific information to prove or refute facts in a study (Kombo & Tromp, 2011). A review of the literature revealed that self-administered questionnaires, interviews and focus group discussions were the most frequently used data collection methods. Data was collected from primary sources. Primary quantitative data was collected by using structured questionnaires. The questionnaire was guided by the study objectives. The closed questions were answered using a 5-Point Likert scale where (5- Strongly agree, 4- Agree, 3 – not sure, 2- Disagree, 1- strongly disagree). The most positive got five points and the most negative one point. The questionnaires were administered by the researcher and research assistants using a google forms for the target group. The period given for collecting the filled questionnaires was set to two and three weeks.

3.6 Pilot

According to Cooper, Schindler and Sun (2006) pilot test is used to establish the accuracy and appropriateness of the research design and instrumentation. This was informed by the fact that the results of the current research should remain reliable and valid as much as possible. The study used 21 county treasury officials from Uasin Gishu County government to carry out the pilot study of which these are part of the sampled respondents. This study adopted 10% of the sample size. According Hertzog (2008), pilot studies typically utilize a sample size between 1% and 10% of the total sample size intended for the full study.

3.6.1 Reliability

Reliability is the consistency of measurement of the degree to which a measurement is free of random or unstable error (Cooper & Schindler, 2014). Testing reliability in research is essential in establishing the quality of the study (Kapoulas & Mitic, 2012). The purpose of reliability is to minimize biases in the study. Reliability focused on the degree to which empirical indicators were consistent across two or more attempts to measure the theoretical concept. A high measure of reliability implies that if future researchers were to undertake the research process independently, they would obtain similar results (Saunders, et al., 2014). For measuring reliability, the study used Cronbach Coefficient (Alpha value) to evaluate the internal consistency of the data collection tool. Cronbach alpha is considered the most important reliability index and considers the number of variables/items of the instrument, and the correlation between the variables. The range of values is between 0 and 1.0. A low value of alpha could be due to a low number of questions, poor interrelatedness between items or heterogeneous constructs. A Cronbach's coefficient of greater than 0.7 suggests that the instrument is accurate in measuring the variable Thao et al., 2022). This study adopted Cronbach's coefficient of 0.7 and above.

3.6.2 Validity

Saunders, Lewis, and Thornhill (2019) assert that the validity of a study is influenced by the measures employed and the precision of the research instruments. In quantitative research, validity refers to how effectively a measurement tool fulfills its intended purpose (Thatcher, 2010). Conversely, in qualitative research, it involves the process by which a researcher confirms the authenticity of the findings (Creswell, 2013). Content validity pertains to how well the instrument addresses the subject matter under investigation. To ensure this, the study's test items were reviewed by experts, including research supervisors, financial colleagues, and specialists in public

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finance management. A comprehensive literature review was also conducted to examine the relevant variables, serving as a method to validate content.

To evaluate the construct validity of the instrument, factor analysis was conducted on the variables. According to Othman et al., (2019) construct validity refers to how well a test measures the intended variable. Following the recommendations of Koh and Nam (2005), Principal Component Analysis (PCA) was performed with varimax rotation. Items with cross-loadings less than 0.30 were discarded, while those meeting the minimum threshold were deemed acceptable for inclusion in the study. The factor analysis produced several statistical outputs, including the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's Test of Sphericity, total variance explained, and the rotated component matrix.

3.7 Diagnostics Tests

"Analysis of diagnostic test involved a test for the assumption of Classical Linear Regression Model (CLRM). This ensured that data collected is within the acceptable parameters of linear regression. The four assumptions tested include, normality, multicollinearity, heteroscedasticity and linearity tests."

3.8 Model for the Study

Objectives	Hypothesis	Type of Analytical model	Interpretation
To assess the moderating effect of technological infrastructure on the relationship between public financial management practices and own-source revenue by county governments in Kenya.	**H_{O1}:** There is no significant moderating effect of technological infrastructure on the relationship between public financial management practices and own-source revenue by county governments in Kenya.	Multiple Regression i. $OSRC = \beta_0+\beta_1$ PFMP $+\varepsilon$ ii. $OSRC = \beta_0+\beta_1$ PFMP $+ \beta_3$TI$+\varepsilon$ $OSRC = \beta_0+\beta_1$ PFMP $+\beta_4$ PFMP *TI$+ \varepsilon$ Where $OSRC$ = own source revenue β_0 = Intercept β_1,β_4, = Coefficients PFMP = public finance management practices TI = technological infrastructure ε = Error term	R^2 Coefficient of 1 indicates a perfect predictability of the model P-value ≤ 0.05 shows a significant Regression between the variables. ANOVA F-test with a P value of ≤ 0.05 shows that the model has predictive ability. VIF< 10, Tolerance level>0 indicates no multicollinearity problems

IV. RESEARCH FINDINGS AND DISCUSSIONS

4.1 Demographic Characteristics

The demographic profile presented in Table 2 reveals critical insights about the respondent composition in this study examining public financial management practices, technological infrastructure, governance framework, and own source revenue generation in Kenya's county governments. The experience profile demonstrates a workforce with moderate to substantial tenure in county government operations. The majority of respondents (52.2%) possess 6-10 years of experience, which is particularly significant given that Kenya's devolved system of governance was implemented in 2013.

Table 2: Demographic CHARACTERISTICS

Demographic Profile		Frequency	Percentage
Experience of Respondents	1-5 years	95	37.8
	6-10 Years	131	52.2
	10 Years and above	25	10.0
	1-5 years	95	37.8
Level of Education	Post-secondary Certificate	82	32.7
	Bachelor's Degree	112	44.6
	Master's Degree	53	21.1
	Doctorate or PhD	4	1.6
Respondent Designation	Member of County Assembly	169	67.3
	Public Service Board Member	16	6.4
	Chief Officer	31	12.4
	Director	35	13.9

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The educational profile reveals a highly qualified respondent pool, with 68.4% holding at least a bachelor's degree, significantly exceeding basic qualification requirements for most county government positions. e presence of 21.1% with master's degrees and 1.6% with doctoral qualifications suggests access to respondents with advanced analytical capabilities who can provide sophisticated insights into governance frameworks and technological infrastructure challenges.

The designation distribution reveals a strategic sampling approach that captures multiple governance levels within county governments. The predominance of Members of County Assembly (67.3%) is particularly significant as MCAs constitute the legislative arm responsible for oversight, budget approval, and ensuring accountability in public financial management. Their majority representation ensures that the study captures perspectives from those directly involved in scrutinizing county budgets, approving supplementary budgets, and monitoring revenue collection performance. The inclusion of Chief Officers (12.4%) and Directors (13.9%), who form the technical backbone of county executive functions, provides operational insights into the actual implementation of PFM practices, technological systems, and revenue collection mechanisms

4.2 Hypothesis Testing

4.2.1. The Moderating effect of Technology Infrastructure on the relationship between Public Finance Management Practices and Own-source revenue by county governments in Kenya.

The aim of this research was to assess the extent to which technological infrastructure act as a moderating factor in the relationship between public financial management practices and own-source revenue by county governments in Kenya. To investigate this, the study tested the following hypothesis: $H0_1$ – here is no significant moderating effect of technological infrastructure on the relationship between public financial management practices and own-source revenue by county governments in Kenya. To evaluate this null hypothesis, a hierarchical multiple regression analysis was performed. The moderation effect was examined using the linear regression capabilities in SPSS ver 28, following the methodology established by Baron and Kenny (1986). This process involved analyzing the regression relationships among public financial management practices, technological infrastructure, and own-source revenue by county governments in Kenya. The regression analysis was conducted in a hierarchical manner; specifically, an interaction term—derived from the product of public financial management practices and technological infrastructure was included as an additional predictor in the model. The hierarchical regression models utilized in this analysis are elaborated upon in the following sections.

Table 3: Adjusted R-squared for the moderating effect of technological infrastructure on the relationship between public financial management practices and own-source revenue

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.556[a]	.309	.304	.46954	.309	55.547	2	248	.000
.576[b]	.332	.324	.46284	.022	8.240	1	247	.004

a. Predictors: (Constant), technological infrastructure, public financial management practices
b. Predictors: (Constant), technological infrastructure, public financial management practices, Interaction Term

Table 3 illustrates the percentage of variation in own-source revenue generated by county governments in Kenya (the dependent variable) that can be attributed to Public Finance Management Practices and Technology Infrastructure (the independent variables). In the initial model, the R value of 0.556 indicates a moderate positive correlation between Public Finance Management Practices and own-source revenue. The R Square value of 0.309 suggests that approximately 30.9% of the variance in own-source revenue can be explained by the Public Finance Management Practices alone. The F Change statistic of 55.547, with a significance level of 0.000, confirms that the model is statistically significant, indicating that the relationship observed is unlikely to be due to chance.

In the second model, the R value increases to 0.576, indicating a stronger correlation when technological infrastructure is included as a moderating variable. The R Square value rises to 0.332, meaning that 33.2% of the variance in own-source revenue can now be explained by both Public Finance Management Practices and technological infrastructure. The R Square Change of 0.022 suggests that the addition of technological infrastructure contributes an additional 2.2% to the explanatory power of the model. The F Change statistic of 8.240, with a significance level of 0.004, indicates that this addition is statistically significant, reinforcing the importance of technological infrastructure in enhancing the relationship between Public Finance Management

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Volume: 12 | Issue: 10 | October 2025 -Peer-Reviewed Journal

Practices and revenue generation. In conclusion, the analysis highlights the critical role of technological infrastructure in moderating the relationship between public financial management practices and own-source revenue. By investing in technology, governments can significantly enhance their financial management capabilities, leading to improved revenue generation and ultimately better public service delivery.

Table 4: ANOVA for the moderating effect of Technology Infrastructure on the relationship between Public Finance Management Practices and Own Source Revenue

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.493	2	12.247	55.547	.000[b]
	Residual	54.677	248	.220		
	Total	79.170	250			
2	Regression	26.258	3	8.753	40.859	.000[c]
	Residual	52.912	247	.214		
	Total	79.170	250			

a. Dependent Variable: own-source revenue
b. Predictors: (Constant), technological infrastructure, public financial management practices
c. Predictors: (Constant), technological infrastructure, public financial management practices, Interaction Term

The analysis of variance depicted in table 4 was intended to evaluate if Technology Infrastructure and Public Finance Management Practices in model 1 and if Technology Infrastructure, Public Finance Management Practices and Technology Infrastructure multiplied by Public Finance Management Practices (interaction term) in model 2 are significant. The ANOVA was also intended to determine whether the amount of variance that model 1 and model 2 accounted for (with the interaction term) is registering more than model 1 (that is characterized without the interaction term). The Findings of the analysis indicate that the model in its entirety is significant given that F = 55.547, p-value = 0.000 < 0.001 for model 1, and F = 40.859, p-value = 0.000 < 0.001 for model 2.

Table 5: Model Coefficients for the moderating effect of Technology Infrastructure on the relationship between Public Finance Management Practices and Own Source Revenue

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.423	.278		5.116	.000
	public financial management practices	.602	.106	.514	5.702	.000
	technological infrastructure	.053	.093	.051	.567	.572
2	(Constant)	3.554	.791		4.491	.000
	public financial management practices	.007	.232	.006	.028	.977
	technological infrastructure	-.461	.201	-.445	-2.290	.023
	Interaction Term	.140	.049	.967	2.871	.004

a. Dependent Variable: Own Source Revenue

In table 5 we are interested in the coefficient (Beta) values of Public Finance Management Practices, Technology Infrastructure and interaction term (Public Finance Management Practices and Technology Infrastructure). The results from Model 1 indicate that the constant term suggests an expected own-source revenue of approximately 1.423 when both public financial management practices and technological infrastructure are at zero, which is statistically significant and establishes a reliable baseline for revenue generation. Furthermore, the coefficient of 0.602 implies that for each one-unit increase in public financial management practices, own-source revenue is anticipated to rise by 0.602 units, while controlling for other factors. The standardized coefficient (Beta) of 0.514 indicates a strong positive effect, highlighting that effective public financial management practices are a significant predictor of revenue generation, as supported by the high t-value and low p-value that confirm the statistical significance of this relationship. In contrast, the coefficient for technological infrastructure is minimal and not statistically significant (p = 0.572), suggesting that it does not exert a meaningful impact on own-source revenue when considered in isolation within this model.

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The results from Model 2 reveal that the constant term indicates a higher baseline expected own-source revenue of 3.554 when all independent variables are zero, and this finding is statistically significant. However, the coefficient for public financial management practices in this model is negligible and statistically insignificant (p = 0.977), suggesting that the effect of Public Finance Management Practices on own-source revenue is not significant when technological infrastructure is included as a moderating variable. In contrast, the negative coefficient for technological infrastructure indicates that an increase in this variable is associated with a decrease in own-source revenue, which is statistically significant (p = 0.023). This unexpected outcome may imply that certain elements of technological infrastructure could be misaligned with revenue generation efforts, potentially leading to inefficiencies or mismanagement. Additionally, the positive coefficient for the interaction term suggests that technological infrastructure significantly enhances the relationship between public financial management practices and own-source revenue. The high t-value and low p-value (0.004) confirm the statistical significance of this moderating effect, indicating that effective technological infrastructure amplifies the positive impact of PFM practices on revenue generation.

The moderating model can be summarized as:
(iii)…Own source revenue = 1.423 + 0.602 (Public Finance management practices) + 0.53 (Technology Infrastructure)
(iv)...Own source revenue = 3.554 + 0.007 (Public Finance management practices) - 0.461 (Technology Infrastructure) + 0.140 (Public Finance management practices and Technology Infrastructure).
The researcher therefore, Rejects the null hypothesis one ($H0_1$) and consequently concludes that there is significant moderating effect of technological infrastructure on the relationship between public financial management practices and own-source revenue by county governments in Kenya. In conclusion, the analysis reveals that while public financial management practices are essential for generating own-source revenue, their effectiveness is significantly moderated by the presence of robust technological infrastructure. This highlights the need for county governments to prioritize technological investments alongside improving financial management practices to optimize revenue outcomes. Additionally, it may be beneficial to assess and refine the existing technological infrastructure to ensure it aligns with the goals of enhancing revenue generation.

4.2.2 Results discussions

The hierarchical regression analysis demonstrates that public financial management (PFM) practices alone exhibit a moderate positive correlation (R=0.556) with own-source revenue (OSR) in Kenyan county governments, explaining 30.9% of its variance (R^2=0.309), with a baseline constant of 1.423 indicating expected revenue when PFM is zero. A one-unit increase in PFM is projected to boost OSR by 0.602 units (coefficient=0.602; standardized β=0.514), underscoring its strong predictive power, as evidenced by significant t-values and low p-values. Incorporating technological infrastructure as a moderator in Model 2 strengthens the correlation (R=0.576) and explanatory power (R^2=0.332), with an R^2 change of 0.022 attributing an additional 2.2% of variance to this interaction. The positive and significant interaction coefficient (high t-value; p=0.004) confirms that robust technological infrastructure amplifies PFM's positive effects on OSR, revealing that while PFM is foundational for revenue generation, its efficacy is markedly enhanced by technological enablers. These findings emphasize the necessity for county governments to integrate technological investments such as digital systems with PFM enhancements to optimize OSR outcomes, potentially through assessments and refinements of existing infrastructure to align with revenue maximization goals.

The current study's findings on the moderating role of technological infrastructure in enhancing public financial management practices and own-source revenue (OSR) in Kenyan county governments are corroborated by Laban, Muchiri, and Muthinja Moses (2023), who analyzed automation's impact in Nyandarua County, revealing that automated revenue systems, mobile payments (β=.538, p=.005), online response processes (β=.239, p=.042), and integrated tax management systems (β=.282, p=.019) collectively explained 84.9% of OSR variations (adjusted R^2=.849), concluding that automation significantly boosts revenue collection and urging its adoption county-wide. Similarly, the results align with Munguti (2022)'s examination of OSR improvement in Machakos County, where automation showed a strong correlation (r=.64, p=.00) and regression significance (p=.00), alongside human resource training (r=.53, p=.00) and enforcement (r=.52, p=.01), highlighting untapped opportunities for revenue maximization through automated systems, strategic challenge mitigation, and enforcement of taxable transactions to meet fiscal targets. These studies collectively reinforce the need for Kenyan counties to prioritize digital automation and integrated technological interventions to amplify OSR outcomes.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The study concludes that while public financial management practices are crucial for predicting own-source revenue, their effectiveness is heavily influenced by the quality of technological infrastructure in place. The

analysis revealed that the introduction of technological infrastructure as a moderating variable enhanced the predictive power of the model, suggesting that robust technological systems can amplify the positive effects of financial management practices on revenue generation. However, it was also noted that the current technological infrastructure may not be adequately aligned with the needs of public financial management. This highlights the complex interplay between these elements, emphasizing the necessity for county governments to invest in and refine their technological capabilities to support effective financial management. Ultimately, the study underscores the importance of prioritizing technological investments alongside improvements in public financial management practices to optimize revenue outcomes, suggesting that a thorough assessment and alignment of existing technological infrastructure with revenue generation goals is essential for enhancing overall financial performance.

The study recommends that Counties should prioritize upgrading existing technological systems, such as Integrated Financial Management Information Systems and mobile payment solutions, to improve efficiency and transparency in revenue collection processes. Furthermore, training programs should be established to equip staff with the necessary skills to utilize these technologies effectively. By enhancing technological infrastructure, county governments can optimize their financial management practices and significantly boost their own-source revenue, leading to improved public services and community development..

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