ELECTRONIC BILLING SYSTEM'S IMPACT ON REVENUE COLLECTION IN THE COUNTY GOVERNMENT OF NANDI IN KENYA

ABSTRACT

The Constitution of Kenya 2010 led to the devolution of various Public services to County Governments, including the responsibility of revenue collection to fund their operations and functions. When the optimal collection of necessary revenues by County Governments is not achieved, the public may suffer adverse consequences, experiencing a denial of essential services. The study examined the effect of the electronic billing system on revenue collection in the county government of Nandi and was guided by the revenue diversification theory and the resource-based view theory. The study employed a descriptive research design. The target population of the study was 4,017 in all the departments in the county government of Nandi. This study used the Yamane (1973) formula to get the sample size and stratified random sampling to select respondents. Data was gathered by means of questionnaires. The statistical package for social sciences was used to analyse the data, and regression and correlation analysis methods were used. Inferential statistics was used to compare each independent variable with the dependent variable. The relationship between variables was evaluated using Pearson's correlation coefficient. Furthermore, regression analysis was conducted to analyze the combined effect of the variables. The study variables were tested at a significance level of 5%. Tables were used to present findings. Results revealed that the Nandi county government's electronic billing system had a favorable and significant impact on revenue collection (β =0.184, p =0.000). The use of online platforms streamlines billing processes. This study recommended that the county's billing should be done through online platforms. The county's internal audit department should ensure that there are adequate electronic checks in bank accounts.

Keywords: Electronic billing, Revenue collection, County Government, Nandi, Kenya

INTRODUCTION

Revenue collection is important to Governments worldwide, as it enables them offer services to the people and acquire assets without incurring debt. These assets, in turn, play a crucial role in fostering economic development. According to Atagboro and Ekpulu (2023), excellent revenue collection performance is needed to improve service delivery efficiency and promote local economic growth. Despite this importance, numerous studies, including Al-Khasawneh (2022), have revealed that many governments encounter huge challenges in achieving optimal revenue collection. This often results in governments falling short of collecting adequate funds to meet their budgetary expectations.

Electronic billing is a type of financial transaction that is carried out using electronic channels it differs from conventional methods like cash and check payments (Oloyede & Funmilayo, 2022).

The adoption of e-billing systems by county governments is instrumental in ensuring that revenue collection is optimized to fund various projects. By embracing cashless transactions facilitated by e-billing, County Governments can streamline their revenue collection processes, reduce inefficiencies associated with traditional payment methods and enhance financial transparency (Wekesa, Abuga & Simotwo, 2022).

The counties in Kenya have consistently fallen short of their revenue collection targets, resulting in significant losses that hinder economic development, growth, and the improvement of service delivery (Jimenez & Afonso, 2022). To address this challenge and substantially reduce corruption while achieving financial objectives, the introduction of Electronic billing systems has to be been implemented. Globally, there has been a surge in the adoption of Electronic billing systems, aiming to eliminate revenue losses through corruption and simplify payment processes (Yan, Mmbaga & Gras, 2023). Technology plays a pivotal role in not only improving the efficiency but also the sustainability of revenue collection in governments globally. Due in large part to the lack of feasible alternatives, revenue authorities historically mostly depended on in-person payment services or promoted the use of mailed checks for payments. However, using third-party entities like banks to collect income has become more cost-effective for revenue entities due to the rising trend of digitalization. The implications of electronic billing systems on revenue collection within the Nandi County Government is looked into in this study.

1.2 Statement of the Problem

The Constitution of Kenya 2010 led to the devolution of various public services to County Governments, including the responsibility for revenue collection to fund their operations and functions (Koskei, Cheruiyot & Naibei, 2019). The County Governments derive their revenue from various sources. When the optimal collection of necessary revenues by County Governments is not achieved, the public may suffer adverse consequences, experiencing a denial of essential services. This challenge has the potential to significantly impact the devolution process (Adenya & Muturi, 2017).

This technology significantly enhances revenue collection performance, providing a competitive advantage (Achieng, Tobias & Mose, 2022). Nevertheless, there is a growing challenge concerning the adoption of e-billing systems by County Governments in Kenya. Given that this technology is relatively new in Kenya, there is a scarcity of studies and information about e-billing systems in

Nandi County Government.The County Government has always fallen short of its revenue targets. A report from the County Treasury indicated that against a revenue target of Kshs 405 million, Kshs 387 million and 373 million in the financial years 2020/2021, 2021/2022 and 2022/2023, the county realised Kshs 278 million, Kshs 287 and million, Ksh. 200 million being an underperformance of 32%, 26% and 44% respectively (County Government of Nandi, 2023). There is thus the need for e-billing systems to boost revenue collection.

There is a dearth of literature on e-billing systems on revenue collection. Kessy (2019) analyzed electronic payment and revenue collection and indicated that e-payment has a notable impact on the process of revenue collection. The findings also highlighted that e-payment has the potential to offer a competitive advantage by enhancing the monitoring of revenue sources and elevating the quality of financial reporting. The study presents a contextual gap as it was conducted in local governments in Tanzania. Chepkoech, Gichana and Agong (2022) investigated how e-payment systems affected Nairobi City's ability to collect money sustainably. The diffusion of innovation theory, resource-based theory, and the success theory of information systems underpinned the research. The study presents theoretical and conceptual gaps. Previous studies present various knowledge gaps that the proposed study seeks to fill. Hence, this study examines the effects of e-billing systems on revenue collection in the county government of Nandi.

Objective of the study

This study examines the effect of electronic billing system n revenue collection in the county government of Nandi.

1.4 Conceptual framework

It is an interconnected set of assumptions or hypotheses that explain how a particular phenomenon functions or how its constituent elements are interconnected (Crawford, 2019). It is often represented visually through a diagram to facilitate understanding of the proposed relationships. It serves as a foundation for understanding the correlational or causal connections between observations and their interpretations. The dependent variable is revenue collection and the independent variable is electronic billing system. Figure 1 illustrates this:

Independent variable **Dependent Variable**

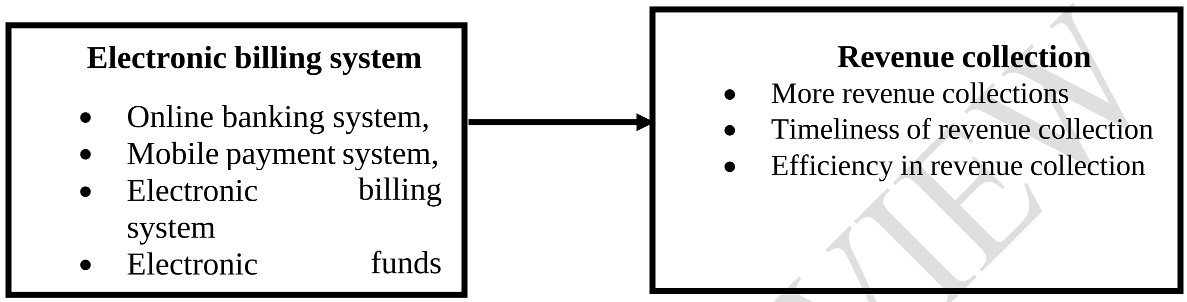

Figure 1: Conceptual framework

LITERATURE REVIEW

Theoretical framework

Theories consist of interlinked concepts and ideas and serve as logical statements, derived from and backed by empirical data or evidence. A theoretical framework provides explanations for the underlying reasons behind observed occurrences. According to Kivunja (2018), theories empower researchers to draw novel conclusions, enhance practical actions, and foster the development of more advanced theories. This study is guided by the revenue diversification theory and the resource-based view theory.

According to Jimenez and Afonso (2022), an organization's revenue portfolio that is balanced between different sources of income increases its financial stability. The theory is drawn from the finance Modern Portfolio Theory. The revenue diversification theory, according to Yan, Mmbaga, and Gras (2023), evaluates whether or not a more varied and well-balanced revenue portfolio might improve financial stability for counties by reducing revenue volatility. According to the study, initiatives implemented to improve income have a beneficial effect on financial results. The performance of revenue collection has been found to benefit from commercial and market-oriented revenue techniques. The theory is applicable to this study as various revenue streams are incorporated in e-billing systems to enhance revenue collection.

The vitality of the Resource-Based View (RBV) structure in the field of strategic management is pointed out by Agus (2020). RBV argues that the capacity of an enterprise to succeed is closely related to the skills and resources it has, which can serve as a basis to gain a competitive advantage. The theory posits that sustained success is achieved by leveraging unique, valuable, and non-substitutable resources. Dynamic capabilities, frequently associated with RBV, are regarded as the primary strategic and organizational routines utilized by managers. These dynamic capabilities enable organizations to adapt, innovate, and reconfigure their resource bases, thereby creating new and sustainable value-generating strategies. Bulińska, Stangrecka, and Bagieńska (2020) linked dynamic capabilities with RBV, emphasizing their pivotal role in shaping a firm's ability to thrive in a dynamic and competitive business environment. Concerning e-billing, adoption is driven by internal factors aimed at enhancing efficiency, improving processes, and acquiring knowledge and expertise, thereby creating opportunities for genuine competitive advantage. An organization that embraces e-billing stands to significantly enhance its county's revenue collection performance. However, if the motivation for adopting the e-billing system is primarily external, the implementing organization may succumb to pressures and may not witness improvement in revenue collection (Greve, 2021). This study recognizes the value of this theory, utilizing revenue collection performance measures as indicators to evaluate the county's success in achieving its objectives.

Empirical review

Kessy (2019) explored revenue collection and electronic payments in Tanzanian local government. A semi-structured questionnaire was distributed to revenue collectors and administrators, and 77 respondents in all were chosen. The data were analyzed employing both linear regression and descriptive statistics. The results demonstrated that e-billing affects revenue collection and increases municipal tax compliance. The study also demonstrated that e-billing might offer a competitive advantage through enhancing the accuracy of financial reporting and accelerating the tracking of the sources of income. Although the report emphasized the benefits of electronic billing, it also noted obstacles to their adoption. These difficulties included a lack of awareness, inadequate technical support, tax collectors' inexperience with the technology, weak connectivity, and an unstable power.

Chepkoech, Gichana and Agong (2022) examined how Nairobi City's sustainable revenue collection was affected by e-payment systems. The diffusion of innovation theory, resource-based theory, and information systems success theory all were used to support the cross-sectional research design of the study. As part of its target population, the Nairobi County Government recruited 98 middle-level managers and 143 low-level managers. Primary data were gathered via semi-structured questionnaires, and descriptive statistics which included means, frequencies, percentages, and standard deviation were used. The results showed that using e-billing improved County revenue collection. The study recommended that in order to improve sustainable revenue collection in Government institutions, policies be implemented by the national and local governments.

Wekesa, Abuga and Simotwo (2022) used a descriptive survey research design to examine how the performance of revenue collection in Trans Nzoia County was affected by electronic payment systems. The study used a questionnaire as its main data collection method and used the census technique, which yielded a sample size of 57 respondents. The questionnaire's reliability was evaluated through the application of Cronbach's alpha coefficient. The results of the study showed that electronic billing machines significantly and positively improved revenue collection performance.

METHODOLOGY

The research design employed by the study was descriptive. Descriptive studies entail not only data collection, but also the categorization, measurement, analysis and interpretation of data (Siedlecki ,2020). The target population of the study were the 4,017 in all the four departments in the county government of Nandi. This is because all staff were involved in revenue matters in the County. This study used the Yamane (1973) formula to get a sample size of 363. The study employed stratified random sampling. The strata were the 4 departments in the county. To get the number of employees per department, the study employed sampling proportionate to population. This ensured that there is an equal representation of each department. Later, the personnel had to be selected for the study through basic random sampling.

Data was collected through questionnaires. Semi structured questionnaires were distributed to the 363 employees. Detailed instructions on how to complete the questionnaires were provided to ensure accuracy and consistency in the responses. The accuracy and consistency of the questionnaires were carefully assessed. Quantitative data was analyzed using the Statistical Package for Social Sciences, employing correlation and regression analysis techniques. A descriptive analysis was conducted to examine the data. Inferential statistics were used to compare each independent variable with the dependent variable. Tables were used to present findings. The research adopted a specific model for analysis: -

$Y=\beta_0 + \beta_1 X_1 + \varepsilon$

Where: -Y is revenue collection; β_0 is a constant where βi is the Beta coefficient: X_1 is an electronic billing system and ε is the error term

RESULTS AND FINDINGS

Descriptive analysis

The analysis is provided to correspond with the study's goals, which are to ascertain how the county government of Nandi's electronic billing system influences revenue collection.

Electronic billing system and revenue collection

Regarding the goal of the study, respondents were questioned five times. Likert scale was employed to display the answers. Results indicate that 58% strongly agreed that billing was conducted through online platforms, 40% agreed while the remaining 2% were not sure (Mean= 4.56; SD=0.532). Likewise, 31% strongly agreed that there were adequate billing machines in the county, 62% agreed and 7% were not sure (Mean=4.25; SD=0.567). Fifty three percent strongly agreed that electronic invoicing was enabled through the system and 47% agreed. (Mean=4.53; SD=0.500). Additionally, 29% strongly agreed that authorization on billing was done online, 64% agreed while the remaining 7% were not sure (Mean=4.21; SD=0.565). Moreover, 41% strongly agreed that the electronic bills generated were accurate, 55% agreed and 4% were not sure. (Mean=4.38; SD=0.546). Table 1 below summarizes the descriptive statistics of the electronic billing system on revenue collection

Table 1: Electronic billing system on revenue collection

STATEMENTS	N	Mean	SD	5	4	3	2	1
Billing is conducted through online platforms.	328	4.56	0.532	58	40	2	0	0
There are adequate billing machines in the county.	328	4.25	0.567	31	62	7	0	0
Electronic invoicing is enabled through the system.	328	4.53	0.500	53	47	0	0	0
Authorization on billing is done online.	328	4.21	0.565	29	64	7	0	0
The electronic bills generated are accurate.	328	4.38	0.546	41	55	4	0	0

Source: Research Data

Linear regression model

To find out how the independent factors affect the dependent variable, a regression analysis was conducted. The results indicate that the R squared, or coefficient of determination, is 0.743. This suggests that, at a 95% confidence level, modifications to the electronic billing system could be accountable for 74.3% of the variability in Nandi County's revenue collection. There were only 25.7% of the variations in income collection that could be attributed to other causes. The link between these variables is measured by the correlation coefficient, or R. A correlation coefficient of 0.862 demonstrates that the variables have a notable and positive link as determined by the data. It may be drawn that there was no autocorrelation among the variables based on a Durbin-Watson value of 1.7.This allowed for reliable deduction of inferential statistics and interpretation as shown in Table 2.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.862[a]	0.743	0.740	0.12859	1.734
a. Predictors: (Constant), e billing					
b. Dependent Variable: revenue collection					

Source: Research Data

Analysis of Variance (ANOVA) is a statistical technique used to analyze the differences among group means in a sample. It is a collection of models and estimation procedures that help researchers determine whether there are statistically significant differences between the means of three or more groups. The ANOVA the results showed a level of significance of 0.000, indicating a substantial link between the dependent and independent variables. Furthermore, the calculated F-value was found to be higher than the crucial F-value (233.326 > 2.372). The model was thus dependable. As a result, the findings were sufficient to draw conclusive inferences and provide reasonable proposals.

Table 3: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	15.432	4	3.858	233.326	.000[b]
Residual	5.341	323	0.017		
Total	20.773	327			

a. Dependent Variable: revenue collection

b. Predictors: (Constant), E-billing

Source: Research Data

Table 4: Coefficients

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.	VIF
(Constant)	0.120	0.140		0.856	0.393	
E-billing	0.158	0.031	0.184	5.069	0.000	1.662
a. Dependent Variable: revenue collection						

Source: Research Data

Table 4 shows the model equation to be:

$Y = 0.120 + 0.184 X_1 + \varepsilon$

Where Y is revenue collection X_1, is the electronic billing system. Holding an electronic billing system constant revenue collection in the county government of Nandi would be at a constant value of 0.120.

The electronic billing system substantially boosted revenue collection in the Nandi County government (β =0.184, p =0.000). Chepkoech, Gichana and Agong (2022) examined how Nairobi City's sustainable revenue collection was affected by e-payment systems. Results showed that using e-payment improved county revenue collection. The authors recommended that to improve sustainable revenue collection in government institutions, policies be implemented by the national and local governments.

CONCLUSION AND RECOMMENDATION

The goal of the study is to ascertain the way the electronic billing system affects Nandi County Government revenue collection. The electronic billing system had a major advantageous effect on revenue collection. It was revealed that billing was conducted through online platforms as there were adequate billing machines in the county. Additionally, recommendations from findings are made, providing actionable insights for practitioners, stakeholders, and researchers.

This study concludes that the digitization of financial documentation contributes to a more streamlined and accessible record-keeping system for both customers and banks. This enhances customer experience by keeping them informed and contributes to better financial awareness and security. Through leveraging digital platforms, customers gain the ability to independently manage various aspects of their banking affairs. This aligns with the evolving preferences of modern consumers who seek autonomy and flexibility in their financial interactions

The use of online platforms greatly streamlines billing processes, especially with the support of advanced billing machines. This platforms offer a comprehensive solution for billing by incorporating electronic invoicing capabilities. Electronic invoicing, facilitated through online systems, introduces a modern and efficient approach to billing procedures. In this context, authorization processes are seamlessly integrated into the online framework, allowing for quick and secure approvals. The automation inherent in electronic billing reduces the likelihood of errors associated with manual data entry, calculation, and processing. The system is designed to meticulously generate electronic bills, reflecting precise details of the transactions or services provided. This accuracy not only enhances the reliability of financial records but also contributes to customer satisfaction by providing transparent and error-free billing statements. Moreover, the efficiency gained through online billing platforms extends beyond accuracy. The digital nature of these systems allows for real-time updates and accessibility, enabling businesses and organizations to stay current with their financial records. Authorized personnel can easily retrieve electronic bills, track payment status, and monitor billing history, contributing to improved financial management and decision-making.

This study recommends that the county's billing should be done through online platforms. The study recommends the introduction of a modern approach to billing processes. Enabling electronic invoicing streamlines the generation and management of bills, reducing reliance on traditional paper-based methods. Additionally, the study advocates for online authorization of billing processes, ensuring a swift and secure approval system. This not only expedites the billing cycle but also promotes a transparent and accountable financial workflow. Importantly, the electronic bills generated through this system are expected to undergo a confirmation process to guarantee their accuracy. This ensures that financial records align with actual transactions, contributing to the billing system's dependability and establishing stakeholder trust.

REFERENCES

Achieng, O. C., Tobias, M., & Mose, T. (2022). ICTs and Revenue Collection in Nairobi City County Government, Kenya. *International Research Journal Publishers*, 4(1), 76–90.

Adenya, P. K., & Muturi, W. (2017). Factors Affecting Revenue Collection Efficiency by County Governments in Kenya-A Case of Kiambu County. *International Journal of Social Sciences and Information Technology,* III(VIII), 2371–2384. Retrieved from http://www.ijssit.com

Agus Zainul Arifin, R. D. (2020). Strategic Orientation on Performance: The Resource Based View Theory Approach. *Jurnal Akuntansi*, 24(1), 131. https://doi.org/10.24912/ja.v24i1.661

Al-Khasawneh, R. O. (2022). Electronic Collection of Public Revenue in the Light of the Corona Virus Pandemic in Jordanian Governmental Institutes. *WSEAS Transactions on Business and Economics*, 19, 852–866. https://doi.org/10.37394/23207.2022.19.74

ATAGBORO, E., & Ekpulu, M. & G. A. (2023). Electronic-Tax System and Revenue Generation Efficiency in Bayelsa State Internal Revenue Board. *Journal of Accounting and Financial Management*, 8(6), 44–57. https://doi.org/10.56201/jafm.v8.no6.2022.pg44.57

Chepkoech, N., Gichana, J., & Agong, D. (2022). Effect of e-payment systems on sustainable revenue collection in Nairobi City County Government. *International Academic Journal of Economics and Finance,* 3(7), 238–253

Haruna, S., & Md Kassim, N. (2019). Willingness to use electronic revenue collection system: Moderating effect of e-collection training on the extended technology acceptance model. *International Journal of Enterprise Information Systems*, 15(4), 60–74. https://doi.org/10.4018/IJEIS.2019100104

Jimenez, B. S., & Afonso, W. B. (2022). Revisiting the theory of revenue diversification: Insights from an empirical analysis of municipal budgetary solvency. *Public Budgeting and Finance*, 42(2), 196–220. https://doi.org/10.1111/pbaf.12309

Karimi, H., Maina, K. E., & Kinyua, J. M. (2017). Effect of Technology and Information Systems on Revenue Collection by the County Government of Embu, Kenya. *International Academic Journal of Information Systems and Technology*, 2(1), 19–35.

Kessy, K. (2019). Electronic Payment and Revenue Collection in Local Government Authorities in Tanzania: Evidence from Kinondoni Municipality. *Tanzanian Economic Review*, 9(2), 89–106.

Koskei, A., Cheruiyot, P., & Naibei, I. (2019). Revenue Collection Efficiency in County Government of Kericho, Kenya. *East African Journal of Business & Economics*, 4(1), 28–39.

Marcoulides, K. M., & Raykov, T. (2019). Evaluation of Variance Inflation Factors in Regression Models Using Latent Variable Modeling Methods. *Educational and Psychological Measurement*, 79(5), 874–882. https://doi.org/10.1177/0013164418817803

Mtebe, J. S., & Sausi, J. (2021). Revolutionization of Revenue Collection with Government E-Payment Gateway System in Tanzania: A Public Value Creation Perspective. *East African Journal of Science, Technology and Innovation*, 2(3). https://doi.org/10.37425/eajsti.v2i3.248

Salmerón, R., García, C. B., & García, J. (2018). Variance Inflation Factor and Condition Number in multiple linear regression. *Journal of Statistical Computation and Simulation*, 88(12), 2365–2384. https://doi.org/10.1080/00949655.2018.1463376

Wekesa, I. B., Abuga, I., & Simotwo, P. (2022). Influence of Electronic Payment Systems on Revenue Collection Performance in Trans Nzoia County Government Kenya. *The International Journal of Business & Management.*