

**EFFECT OF ELECTRONIC PAYMENT SYSTEM ON REVENUE
COLLECTION PERFORMANCE OF COUNTY GOVERNMENT OF
KAJIADO, KENYA**

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DECLARATION AND RECOMMENDATION

This thesis is my original work and has not been presented for examination in any other university.

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DEDICATION

I sincerely owe my work to God Almighty, my wife Nancy and children Kelvin, Lewin, Barbra and Maya for their constant support and encouragement all through the program.

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ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
CC	Contact Centre
CRA	Commission on Revenue Allocation
EBM	Electronic Billing Machines
EFT	Electronic Funds Transfer
IFMIS	Integrated Financial Management Systems
KRA	Kenya Revenue Authority (KRA),
LGRCIS	Local Government Revenue Collection Information System
OECD	Organization for Economic Co-Operation and Development
OSR	Own Source Revenue
TAM	Technology Acceptance Model

ABSTRACT

The study examined the effect of electronic payment systems on revenue collection performance in the County Government of Kajiado, Kenya. Revenue collection is a crucial aspect of county governments, enabling them to finance development projects and meet their financial obligations. Despite the adoption of electronic payment systems, challenges such as inefficiencies, fraud, and delayed payments persist. This study aimed to determine the influence of key components of electronic payment systems; online billing, receipting, payment, and response on revenue collection performance. Guided by the Optimal Tax Theory, Resource-Based View Theory, Innovation Diffusion Theory and the Technology Acceptance Model, the study employed a descriptive research design to investigate the relationship between the independent variables and revenue collection performance. The study targeted 195 respondents, including Executive Committee Members, Finance Personnel, and Revenue Officers, using stratified sampling to ensure representation. Sample size was 131. Data was collected through structured questionnaires, validated through pilot testing, and analyzed using both descriptive and inferential statistical methods, including multiple regression analysis. The findings revealed that all components of the electronic payment system significantly impacted revenue collection performance. Online billing and online response had the most substantial influence, demonstrating their importance in ensuring accurate billing and effective taxpayer engagement. Online receipting and payment also positively contributed by enhancing accuracy, convenience, and trust in the payment process. Correlation analysis further supported these findings, with strong positive relationships between the components of the electronic payment system and revenue collection performance. The results indicate that improving electronic payment systems can significantly enhance revenue collection by reducing inefficiencies, increasing transparency, and fostering taxpayer compliance. The study concludes that adopting and optimizing electronic payment systems is critical for achieving better revenue collection performance in county governments. The study recommends strengthening the online billing and response processes through continuous technological upgrades and robust taxpayer engagement mechanisms. Additionally, enhancing the usability of online receipting and payment platforms is essential to encourage adoption. Policymakers are urged to standardize electronic payment systems across counties and promote digital inclusion to address barriers to adoption. Future research could explore the long-term impacts of electronic payment systems, their scalability, and inter-county comparisons to identify best practices. This study provides actionable insights for county governments aiming to improve revenue collection efficiency through digital transformation.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Mallick (2021) provided a definition of electronic payment systems that broadly encompasses any systems that enable safe electronic commerce transactions between individuals or organizations. These systems encompass a wide range of financial transactions, from electronic currency and checks to smart cards and micropayment alternatives like PayPal. But according to Jain and Jain (2025) electronic payment encompasses any payment services that make use of information and communication technologies like encryption and telecommunications networks, or payments that are started, processed or received electronically. The electronic payment methods that were categorized by Opuala-Charles and Orji (2022) were e-cash, credit card and credit-debit based, and hybrid.

Paying bills and other transactions online, over the phone, or by electronic fund transfer is known as e-payment, and it's a safe, convenient, and secure option. Consumers now have payment options other than cash, checks, and money orders in the form of electronic payment (Kusimba et al., 2024). With the advent of the internet and other payment methods, a new trend has emerged: the gradual replacement of paper currency and coins with electronic cash. In light of the many other payment methods that are widely seen as superior alternatives, Bludnik (2023) concedes that paper currency is rapidly becoming obsolete. As an example, moving away from a cash-based economy has been a big priority for Nigeria.

To help individuals, businesses, and financial institutions deal with the inherent difficulties of the payment and settlement process, electronic payment systems have been developed. Customers can avoid making a special trip to the bank's branches by using the e-payment system (Okiro, 2021). Plus, they can do things like move funds to other accounts without leaving the comfort of their own homes thanks to this feature. Electronic purses/wallets, online/Internet payments, digital person-to-person (P2P) transactions, digital funds transfer (EFT), ATMs, debit, credit, and smart cards, mobile banking, personal computers, digital cash, digital person-to-person (E-Cash) systems, telephone banking, personal computers, and digital funds transfer are all options available to consumers when making electronic payments. Secure digital payment methods, such as electronic checks or encrypted credit card information, or digital currency supported by a third party, legal money, or a bank, are essential to peer-to-peer (P2P) transactions (Sokobe, 2021).

The electronic payment system has had its fair share of problems, say Adenya and Muturi (2020). These challenges include, but are not limited to, the following: insufficient funding, governance issues, human element credibility, skilled resource shortages, data transmission integrity, infrastructure gaps, interconnectivity, and interoperability caused by technology and institutional capacity.

County governments have come up with a variety of strategies to assist them collect enough money to fulfill the revenue collection obligation. It was documented that counties or former municipal and local authorities could not cover their financial obligations owing to taxpayers not complying to the law and theft, even after devolution. As a result, the counties implemented extensive internal controls and a computerized system for

collecting taxes (Kusimba et al., 2024). One of the entities that loves and appreciates using technology and internal controls in their administration of revenues is Kirinyaga County, which is the study region (Mutiso & Maguru, 2020).

Efficient service delivery and economic growth at the county level are promoted by high revenue collection performance. Yet research and scholarly articles reveal that the majority of governments struggle mightily with revenue collection Tumwebaze et al. (2022) meaning they fail to amass enough money to meet their budgetary obligations. County treasury funds have not been adequately funded for a long time by revenue collectors (Ngotho & Kerongo, 2021).

1.1.1 Global Perspective on Revenue Collection Performance

Revenue collection performance is recognized globally as a cornerstone of sustainable public finance and economic development. In developed economies, automation and electronic payment systems have significantly improved efficiency, transparency, and accountability in revenue management. For example, in the United States, automated tax collection systems have streamlined billing, enhanced compliance, and minimized leakages, thereby enabling the government to fund large-scale development projects without excessive reliance on debt (Haughton & Desmeules, 2020). Such performance improvements have demonstrated how digital innovation directly translates to stronger fiscal outcomes.

In Europe, countries like Estonia have become global leaders in digital revenue collection performance due to their integrated e-tax platforms. Estonia's electronic tax filing system ensures near-universal compliance, with more than 95% of taxpayers filing online, allowing the country to collect revenues efficiently and allocate resources effectively

(Adenya & Muturi, 2017). This example underscores the potential of leveraging digital systems not only to improve accuracy and accountability but also to enhance taxpayer satisfaction through faster and more reliable services.

Across Asia, countries like Singapore have also redefined revenue collection performance through advanced digital systems. Their electronic invoicing and mobile payment platforms provide real-time data for both taxpayers and administrators, ensuring timely remittances and reducing fraudulent activities. These global experiences highlight how robust technological adoption drives improved revenue performance, positioning digital systems as essential enablers of fiscal sustainability (Asian Development Bank, 2024).

1.1.2 Regional Perspective on Revenue Collection Performance

Within Africa, revenue collection performance has historically been undermined by inefficiencies, weak institutional capacity, and corruption. However, several countries are making strides by integrating digital payment systems. In Nigeria, the introduction of e-taxation platforms has improved self-assessment and online payment compliance, significantly enhancing government revenue streams despite challenges of limited internet penetration and taxpayer resistance (Mackender, 2024). This shows that while progress has been made, performance still depends on addressing structural barriers to digital adoption.

Tanzania presents another regional example where performance has improved after the adoption of the Local Government Revenue Collection Information System (LGRCIS). This system, integrated with GIS, has strengthened billing accuracy and provided timely taxpayer feedback, allowing local governments to reduce revenue leakages and broaden their tax base (Isgut & Pellegrino 2024; Zahari et al., 2022). Although challenges remain

in enforcing compliance, Tanzania's case demonstrates that even in resource-constrained settings, digital tools can elevate revenue performance.

Uganda's Uganda Revenue Authority (URA) has also shown how automation can reshape performance outcomes. Through its electronic tax system, URA has increased compliance levels, reduced processing time for tax returns, and minimized opportunities for corruption, thereby improving the efficiency of revenue collection (Ejiku, 2019; Nkote & Luwugge, 2010). These African cases reflect a growing trend where counties and countries alike recognize the performance gains associated with digital payment systems, though the pace of progress varies.

1.1.3 Revenue Collection Performance of Counties

Collecting tax money is critical for every county government throughout the world since it allows them to buy debt-free assets that they may put toward economic development. Therefore, a country's Service Delivery is supported or made easier via the income that the government collects from its residents (Adhikary et al.,2021). Taxes are not like donations in that they are not paid voluntarily by the taxpayer. Instead, it's a mandatory tax payment (Garner, 2020). According to Maswadeh and Hanandeh (2020), county governments use the funds they receive to invest in social and economic development, grassroots growth, and service delivery. According to Chilambwe and Tembo (2023), the development, expansion, and improvement of service delivery at the county level are dependent on the County Government collecting sufficient income.

If county governments are serious about improving service delivery and fostering economic growth, they must have a reliable source of income (Ngotho & Kerongo, 2021). According to the Organization for Economic Co-Operation and Development (OECD),

developing nations rely on taxation as a means to finance both short-term needs and long-term investments in public goods (Organisation for Economic Co-operation and Development [OECD]; African Union Commission [AUC]; African Tax Administration Forum Revenue Statistics in Africa [ATAF], 2024). Revenue collection in emerging economies, such as Kenya's, has, however, not always been optimal. There are significant local revenue collection gaps because counties are unable to collect enough money to satisfy their budget projections (Onyango, 2022) and because of other problems with their revenue collection performance. According to Khamis et al. (2022), the revenue collecting system is at the center of the major difficulties in revenue collection.

Using their primary sources of income, county governments may earn as much as Kshs 216 billion per year, up from the current Kshs 31 billion. On October 5, 2022, the Commission on Revenue Allocation (CRA) and the World Bank Group released their second edition of the Comprehensive Own Source Revenue Potential and Tax Gap Study of County Governments (Ng'eno 2022). This is in accordance with their findings. According to the findings, the 47 county governments have the potential to earn Own Source Revenue (OSR) almost seven times more than what they do now. This additional revenue might cover a substantial amount of their yearly budgets. To help County Governments and other users evaluate county performance, compare to best practices, and determine their ability to raise income, we have given detailed estimations of OSR revenue potential.

This year's OSR report of 2020 singles out the following counties as having shown six-year increases in their revenue collections: Garissa and Embu Revenue receipts for counties surged by 274 percent and 202 percent, respectively, for the time period under

consideration. Fifteen of the counties included in the study had a six-year increase in revenue of 100% or more. Nandi, Kiambu, Elgeyo-Marakwet, Laikipia, Taita-Taveta, Marsabit, Makueni, Kakamega, Tharaka-Nithi, and Nyandarua are among these. West Pokot, Lamu, Mombasa, Kirinyaga, Mombasa, Lamu, and West Pokot are also among these. On the other hand, throughout that time, four counties had a decrease in their revenue growth. Here they are: Busia, Wajir, Homabay, and Mandera. In addition, we found that Nairobi County has increased by less than 1% during the same time period, while having the highest projected potential of Kshs. 77 B per annum and the largest operating surplus ratio (OSR).

The majority of counties, with the exception of those possessing game reserves, failed to generate more than 40% of their projected income, according to a study on counties' OSR reports that was conducted by the National Treasury in 2018. From what we can see, counties benefit from better game reserve management when it comes to OSR collecting. For example, the Maasai Mara game reserve is a major source of income for Narok County, which brings in over 1 billion shillings each year. Isiolo, Laikipia, and Baringo are among the counties that collect more than 40% of their anticipated revenue potential; Samburu County has also surpassed its potential. The game reserves in each of these counties contribute significantly to their overall state revenue (Commission on Revenue Allocation, 2021).

1.1.4 County Government of Kajiado

Situated in the Rift Valley in southern Kenya, Kajiado County encompasses 21,900.9 km². The county's estimated population in 2012 was 807,069, with a growth rate of 5%, according to the Kenya Institute for Public Policy Research and Analysis (KIPPRA,

2019). Pastoralism, farming, trading cattle, tourism, and mining are the primary economic activities of the county. Given the high doctor-to-population ratio, it is clear that the health industry needs to hire additional medical personnel.

Among the many sources of income, the Single Business Permit (SBP) brought in Kshs.189 million, followed by sand fees at Kshs.80.8 million, building plan approval at Kshs.65 million, land rates at Kshs.50.6 million, and plot rent at Kshs.44 million, as reported by Owino (2023). Bus Park fees increased by 571 percent, sheep/goat cess by 237 percent, food and hygiene license by 209 percent, and parking and transit fees by 208 percent, among other streams that saw significant increases compared to the 2019/20 fiscal year.

Digital billboards placed strategically across Kajiado County have been an excellent source of money for the county, and the county has gone to great lengths to automate its revenue collecting process (Omido & Kasibo, 2021). Along with the county's integrated financial information management system (IFMIS), the automated tax systems have been correctly mapped and integrated. Revenue collection, budgeting, and the use of county money to finance the devolved unit's essential tasks are all interdependent on this. Taxes may be more readily sent by small and medium-sized businesses using the county's M-Pesa pay bill number, which is compatible with a variety of mobile banking systems (Nyangito et al., 2022).

Kajiado County uses an electronic payment system for things like parking, rent, land charges, and single business permits. All county governments rely heavily on tax revenue since it allows them to build their economies via the purchase of debt-free assets. But county governments' tax collection efforts have fallen short at times (Ngotho & Kerongo,

2022). By offering an alternative to the traditional practice of exchanging cash for county revenue, the e-payment initiative aims to eradicate or greatly diminish corruption.

1.2 Statement of the Problem

With an annual goal of KES 53.66 billion, county governments earned KES 34.44 billion in FY 2020/2021—64.2% of the objective. The previous record during this time was KES 35.77 billion in FY 2019/2020, hence there was a decline (Office of the Controller of Budget [OCOB], 2021). In addition, the OCOB report notes that counties were aiming for KES 54.9 billion in aggregate annual own source revenue for FY 2019/20, but only managed to collect KES 35.77 billion, or 65.2% of the objective. In comparison to the KES 40.30 billion earned in FY 2018/19 (representing 74.8% of the yearly revenue objective), this represented a decline. Annual own source revenue for counties was intended to be KES 53.86 billion, but only KES 40.30 billion was collected, representing a shortfall of 74.8% of the objective (FY 2018/19).

According to the report from the Office of the Controller of Budget (2020) for the FY 2019/20, The approved budget for FY 2019/2020 for the forty-seven County governments totaled to Kshs. 499.62 billion. Sixty-two per cent (Kshs. 311.63 billion) represented recurrent expenditure while thirty-eight per cent (Kshs. 187.98) billion represented development budget. The budget was financed using equitable share, grants from national government and development partners, own source revenue and cash balance from the previous FY at Kshs. 316.5 billion, Kshs.22.9 billion, Kshs.39.09 billion, Kshs.54.9 billion and Kshs. 51.23 billion respectively. The report further enumerates that the county governments recorded a Kshs. 4.53 billion decreases in revenue collected in the FY 2019/2020 as compared to FY 2018/2019 representing 9.6 per cent decrease. The FY

2018/2019 generated revenue of Kshs. 40.30 billion 2019/2020 as compared to the FY 2019/2020 whereby a total of Kshs. 35.77 was generated. According to the County Budget and Review Outlook Paper (CBROP) for 2019/20, local revenue collection fell short of the objective by 52 percent, or Ksh 0.61 billion. When contrasted with the actual revenue generated in FY2018/19, this represented a decline of 16.2% in performance. To address this knowledge vacuum, this study sought to contribute to the existing body of literature by investigating the effect of electronic payment system on revenue collection performance of county government of Kajiado.

1.3 Research Objectives

This study was guided by the following general and specific objectives:

1.3.1 General Objective

To examine the effect of electronic payment system on revenue collection performance of county government of Kajiado, Kenya.

1.3.2 Specific Objectives

The specific objectives included:

1. To determine the effect of online billing process on revenue collection performance of county government of Kajiado, Kenya.
2. To establish the effect of online receipting process on revenue collection performance of county government of Kajiado, Kenya.
3. To assess the effect of online payment process on revenue collection performance of county government of Kajiado, Kenya.
4. To analyze the effect of online response on revenue collection performance of county government of Kajiado, Kenya.

1.4 Hypothesis of the study

The study was guided by the following hypotheses

H₀₁: Online billing process has no significant effect on revenue collection performance of county government of Kajiado, Kenya.

H₀₂: Online receipting process has no significant effect on revenue collection performance of county government of Kajiado, Kenya.

H₀₃: Online payment process has no significant effect on revenue collection performance of county government of Kajiado, Kenya.

H₀₄: Online response has no significant effect on revenue collection performance of county government of Kajiado, Kenya.

1.5 Significance of the Study

1.5.1 Policy Makers

With the information and tactics gleaned from this study, policymakers will be better equipped to devise effective methods of collecting taxes. The study's results will be useful for policymakers in the government, particularly those in the Ministry of Finance and the Kenya Revenue Authority, as they consider how to best manage the public debt, influence economic activity levels, and broaden the tax base at the grassroots level.

1.5.2 Kajiado County Government

The study's results contribute to the understanding of the ways in which electronic payments affect tax collections and the obstacles that counties face when trying to adopt such systems, and they also provide recommendations on how to overcome these obstacles and increase the use of electronic payments generally. Also, the research will aid the

county in pinpointing important issues and offering remedies to considerably cut down on their income gap, which would ultimately lead to better tax collection.

1.5.3 The public and Stakeholders

Findings from this study would help shed light on the difficulties counties have in collecting taxes and how it impacts the provision of public services. Additionally, the general population would benefit from increased knowledge of the importance of public input throughout the budgeting process for county governments.

1.5.4 Researchers and Academicians

Academics and researchers interested in automating revenue systems and collecting taxes at the federal and state levels might benefit from this study's results. For academics and researchers in the future, it would lay the groundwork for filling up the gaps that have been found.

1.6 Scope of the Study

The study investigated the impact of an electronic payment system on the revenue collection efficiency of the Kajjado county government. The study's target demographic included 195 respondents, namely comprised of Executive Committee Members, Finance personnel, Heads of Departments, Finance and Accounts Officers and Revenue Collection Officers. This study was based on the observation that revenue collection affects several county departments and has cross-cutting effects on all of them. The selected respondents were better equipped to give crucial information focusing primarily on the indicators of revenue collection. The study was scheduled to be conducted during a four-month timeframe, mainly from July 2024 to November 2024.

1.7 Limitation of the Study

This study faced several limitations, but efforts were made to address each to ensure the reliability and validity of the findings. First, the study was geographically limited to Kajiado County, potentially restricting the generalizability of the results to other regions with different socio-economic contexts. To mitigate this, the study adopted a rigorous sampling approach to ensure a representative cross-section of respondents within the county, offering robust insights into the local dynamics.

Second, the reliance on self-reported data posed a risk of biases such as social desirability or inaccuracies in recollection. This was addressed by ensuring the anonymity of respondents and using carefully structured, validated questionnaires to encourage honest responses. Third, while the study focused on four key components of the electronic payment system online billing, receipting, payment, and response other factors such as system maintenance and external economic conditions were acknowledged but excluded due to scope limitations. These gaps were highlighted as areas for further research.

Additionally, the cross-sectional design limited the ability to observe long-term impacts of electronic payment systems; however, the study leveraged recent data to provide a snapshot of current trends. Lastly, while the study did not explicitly account for variations in taxpayer behavior across demographic groups, the use of a diverse sample helped capture a wide range of perspectives, enhancing the comprehensiveness of the findings. These measures ensured that the study's limitations were addressed to the extent possible, strengthening the overall credibility of the results.

1.8 Assumptions of the Study

An assumption is a belief or supposition that can be acknowledged or accepted based on a specific statement. Throughout this study, the specified deductions were executed: Research variables: online billing process, online receipting process, online payment process, and online response and their impact on the revenue collection performance of Kajiado County Government. The responders provided complete assistance to the researcher throughout the data collection process, ensuring that the desired data and information are readily available and easily accessible. The responders freely and truthfully furnished information to the researcher.

1.9 Operational Definition of Key Terms

Electronic Payment System:	A way of paying for products and services online, rather than using actual currency or cheques.
Online Billing Process:	Process of generating and receiving invoices digitally as opposed to using paper forms.
Online Payment Process:	Refers to how money moves from your customer to your business.
Online Receipting Process:	An e-receipt is a digital record furnished by a vendor subsequent to the receipt of payment from your organization.

Online Response:

A review of the automated revenue collecting process's efficacy and efficiency.

Revenue Collection Performance:

Refers to a governmental entity that invoices the general public or a specific individual for fines, taxes, or any other applicable charges.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter dealt with the theoretical framework, the conceptual framework, review of key variables affecting revenue collection performance of county government of Kajiado, empirical review and gaps that exist in the research.

2.2 Theoretical Framework

While the four theories provide valuable insights into the dynamics of electronic payment systems and revenue collection performance, this study is primarily underpinned by the Optimal Tax Theory and the Technology Acceptance Model (TAM). Optimal Tax Theory offers a lens for evaluating efficiency, equity, and compliance in digital tax administration, particularly relevant in understanding the role of online billing and receipting in minimizing distortions and enhancing fairness (Aliyu et al., 2020; Kanini, 2021). On the other hand, TAM provides a behavioral perspective by explaining how taxpayers perceived usefulness and ease of use influence the adoption of electronic payment platforms (Nyangito et al., 2022; Wako et al., 2023). The Resource-Based View Theory and Innovation Diffusion Theory are applied as supportive frameworks to highlight the importance of institutional resources and adoption dynamics, but they are not the core underpinning theories of this study.

2.2.1 Optimal Tax Theory

The concept of Optimal Tax Theory was first introduced by economist James Mirrlees in the 1970s, who later won the Nobel Prize in Economics for his contributions to public

finance. The theory emerged as an attempt to balance government revenue needs with minimizing distortions in individual and corporate decision-making (Balan et al., 2022). At its core, the theory argues that while taxation is necessary for financing public goods, it should be designed in a way that achieves efficiency, fairness, and compliance without discouraging productive behavior or creating unnecessary economic burdens. This balance makes the theory particularly relevant when evaluating modern revenue collection mechanisms such as online billing systems (Aliyu, Arasanmi et al., 2020).

At its foundation, Optimal Tax Theory emphasizes efficiency in tax collection and fairness in tax distribution. An online billing process aligns with these principles by streamlining how revenue is assessed and collected (Kanini, 2021). Instead of relying on manual systems prone to errors and delays, online platforms allow governments to automate invoicing, track payments in real time, and reduce administrative costs (Chepkoech et al., 2022). In theory, such efficiency reduces compliance costs for taxpayers while improving transparency in county revenue systems. For Kajiado County, the adoption of online billing should ideally create an environment where residents and businesses find it easier to meet their obligations without unnecessary bureaucratic hurdles (Jepkoech, 2021).

Another important element of Optimal Tax Theory is the idea of minimizing distortions while maximizing compliance. Online billing processes contribute to this by lowering opportunities for corruption and leakages, as payments are directly linked to digital records (Sande et al., 2023). By standardizing charges and eliminating subjective discretion by revenue officers, online systems promote horizontal equity where taxpayers in similar circumstances are treated the same. In addition, they support vertical equity by ensuring larger taxpayers are proportionately billed, with fewer chances of manipulation.

From this perspective, online billing systems theoretically reinforce the goals of optimal taxation by improving fairness and predictability in the revenue collection framework (Jepkoech, 2021).

However, despite these theoretical advantages, the study on Kajiado County indicates that online billing has had no significant effect on revenue collection performance. This finding suggests that the challenges may lie not in the theoretical model but in the practical implementation. Issues such as inadequate internet penetration, low levels of digital literacy among taxpayers, resistance to change, or system downtime could undermine the potential benefits. It is also possible that taxpayers continue to find ways around the system, or that enforcement remains weak despite technological improvements. This critique underscores that while Optimal Tax Theory provides a sound framework, the actual outcomes depend heavily on contextual realities such as infrastructure, enforcement mechanisms, and user adaptability.

The choice of Optimal Tax Theory is justified because it provides a comprehensive lens through which to evaluate the online billing process in Kajiado County. The theory is not limited to abstract principles but extends to practical policy design by emphasizing efficiency, equity, and compliance. By applying this theory, researchers can better understand whether online billing enhances the fairness of revenue administration, reduces compliance costs, and improves efficiency in line with optimal taxation goals. Even if the current findings show limited impact, Optimal Tax Theory remains a valuable framework to explain why online billing could still be instrumental in shaping effective and equitable revenue systems in the long term.

2.2.2 Resource Based View Theory

According to Owino (2023), the Resource Based View, which Barney initially put up in 1991, argues that the distinctiveness of an organization's resources determines its competitiveness. Therefore, a critical point of convergence is the evaluation of the firm's available resources. The term "resources" can apply to both tangible and intangible assets that a company chooses to employ in developing and executing its plans (Mbevi, 2022). Tangible resources include things like money, buildings, and technology as well as organizational assets. Owiti (2022) argues that intangible resources include things like people, reputation, and new ideas.

Processes that don't provide value hurt a company's competitiveness because they divert attention away from the organization's primary objectives (Mutio, 2022). The term "rareness" refers to the way in which a company might get an advantage over its rivals by creating something really unique and valuable out of a limited resource (Korir, 2022). The term "imitability" describes how difficult it is for rival companies to replicate a company's unique offerings. The outcome is that the resource-based approach places an emphasis on the firm's resources and how it utilizes them to acquire a competitive edge (Kamara, 2021).

When examining Barney's theory of competitive advantage, two assumptions are considered. The basic premise is that every company has its own unique set of resources (Ndunda et al., 2020). The second issue is that industries can't just swap out their competitive resources since such resources aren't very mobile (McGahan, 2021). Even while a company's resources may have been valuable in the past, they may become less so in the future owing to factors including changing customer tastes, new technologies,

industry structures, and government laws; this is why sustainability is so crucial (Amara, 2022).

The theory is applicable to county governments in this setting because it lays out the steps that may be taken to improve the revenue performance of county governments via the utilization of technology and automation of operations. According to the hypothesis, electronic payment technologies including online invoicing, online receipting, online payment, and online response may be used as valuable tools to increase revenue collection.

2.2.3 Innovation Diffusion Theory

The Innovation Diffusion Theory was first advanced by Everett Rogers in 1962, who sought to explain how new ideas, practices, and technologies spread within a social system. Rogers argued that the adoption of an innovation is not instantaneous but rather follows a process influenced by communication channels, time, and the characteristics of the adopting community (Chiamaka et al., 2021). This framework has been widely applied in fields ranging from agriculture and healthcare to information technology and governance, making it particularly relevant in examining how county governments embrace digital tools such as online receipting systems (Kagabo, 2021).

At the heart of the theory are five key attributes that determine the rate of adoption of any innovation: relative advantage, compatibility, complexity, trialability, and observability. Online receipting demonstrates a clear relative advantage by replacing manual receipt books with a transparent and efficient digital platform. Its compatibility with modern digital practices in finance and governance makes it an appropriate tool for streamlining county revenue systems (Alkhowaiter, 2020). However, complexity may slow adoption if

taxpayers or staff perceive the system as difficult to use. The ability to test the system (trialability) and observe its benefits, such as reduced fraud and quicker processing, also play critical roles in shaping how quickly users accept online receipting as a legitimate and trustworthy tool (Mbevi, 2022).

In practice, online receipting aligns well with Rogers' categories of adopter's innovators, early adopters, early majority, late majority, and laggards. In Kajiado County, for instance, younger and tech-savvy taxpayers may act as innovators and early adopters, quickly embracing the convenience of digital receipts. As these groups demonstrate efficiency and reduced disputes over payments, their experiences serve as observable evidence that encourages the early and late majority to follow suit. Nonetheless, laggards often those with limited access to technology or resistance to change may still prefer traditional paper receipts, slowing down the full diffusion of the innovation across the county. This gradual adoption pattern explains why the benefits of online receipting may not be immediately reflected in improved revenue collection performance.

Despite its potential, the study finding that online receipting has no significant effect on revenue collection highlights practical barriers. Digital literacy gaps, unreliable internet connectivity, and limited sensitization efforts can undermine the perceived relative advantage of the system. Furthermore, if enforcement remains weak or if some taxpayers find ways to bypass the system, the transparency benefits are diminished. This critique underscores that while Innovation Diffusion Theory provides a strong lens for understanding how such technologies spread, adoption cannot be assumed it must be actively supported by training, infrastructure, and consistent enforcement of digital payment policies.

The choice of Innovation Diffusion Theory is justified because it provides a structured framework to analyze not just whether online receipting is introduced, but how it is accepted by different groups within the county. By focusing on the attributes of the innovation and the social dynamics of adoption, the theory explains why online receipting may take time before significantly influencing revenue collection performance. It recognizes that success is not merely about having the technology but about how effectively it diffuses through the community of users. This makes it a fitting theoretical lens for evaluating the promise and limitations of online receipting systems in county governments such as Kajiado.

2.2.4 Theory of Technology Acceptance Model

Davis first put out this hypothesis in 1989, and it attempts to provide an explanation for the model of how individuals accept technology when it is forced upon them. According to the concept, there are two main elements that affect consumers' adoption of the technology, and they are; How much the user thinks the new technology will help them perform better on the job is what we mean when we talk about perceived usefulness (Wako et al.,2023). More rapid adoption and usage of technology is likely to occur if users have high expectations that it will significantly improve their performance. But until absolutely necessary, like in the office, users would resist using technology that they believe will not improve their performance (Ndunda, et al., 2020).

Nyabuti (2023) states that the level to which a prospective user feels a new technology will need little effort to use is known as its perceived ease of use. those are more inclined to embrace technology if they see it as easy to use with little effort, as compared to those who perceive it as difficult to use. Perceived usage, rather than perceived facility, had a

greater influence on behavior, according to Davis (1989) on this sample, which Nthenge (2020) expands upon. In addition to its extensive empirical backing, the TAM's robust theoretical foundation and IT-specific focus are its main advantages.

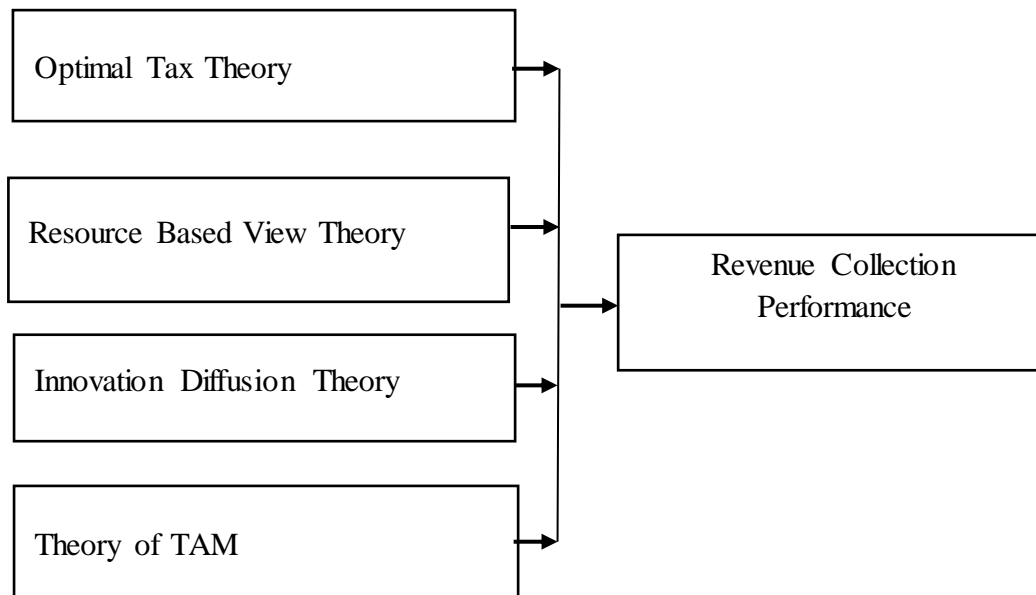
In an effort to decipher the user's actions in light of the utility knowledge and use facility that Davis identified in 1989, Nyangito et al. (2022) state that the TAM model was developed to explain the causal relationship between user acceptance and actual computer usage. Perceived usage is the determining factor in whether or not an individual really uses a piece of technology to boost his productivity on the job (Kibona & Goyayi, 2025). The problem is that if the technology is very difficult, the user may not be able to benefit from it, even though they are aware that the technology in question is valuable.

The goal of the county government's efforts to improve tax collection is to make their systems more user-friendly (Kagabo, 2021). To achieve this goal, we are streamlining the processes that citizens use to interact with counties so that they can do it online from any location and avoid long lines at county offices. We are also making sure that most Kenyans can easily use our online billing, receipting, payment, and response systems. Usability and practicality are the two most important factors (Owino, 2023).

This theory is applicable to the research at hand since it defines technological acceptability. Individuals will employ a certain technology if they have faith that doing so would lead to beneficial outcomes, with an emphasis on the perceived utility and simplicity of use, according to the hypothesis. Perceived usefulness, perceived ease of use, and perceived danger of usage are the three components of technological acceptability that this study finds to be associated with revenue collection.

Figure 2.1:

Theoretical Framework



2.3 Empirical Literature Review

2.3.1 Online Billing Process and Revenue Collection Performance

There were a lot of new ideas put up in Kenya in the 1980s that increased tax money for the community. Cairo and Urio (2020) draw attention to the Nyeri and Mavoko examples, which centered around billing and collection reforms. Specifically, they emphasized the use of IFMS to detect tax defaulters and handle bad debts. The authors draw the conclusion that the IMFS had a significant role in increasing these cities' local tax collections by bringing together relevant data and drawing out the necessary steps.

Government agencies are seeing rapid adoption of electronic billing systems, according to Alsarmi and Ahemed (2022). Thirteen percent of city agencies are now sending invoices electronically, and another fifteen percent are thinking about doing so, according to recent polls. Many county governments have likely noticed an uptick in the number of requests from residents to have their bills sent electronically. Determining electronic

billing and matter management systems is a crucial technological choice that county departments can make, with substantial positive and negative implications.

Research by Lyimo and Makilully (2022) found that the Kampala city council has tried many things to increase money from property taxes. A bill distribution push, media campaigns, improved reminders, more payment locations, individual pressure on significant defaulters, prioritizing of bad debts, and the employment of private bailiffs are all components of a program since 1999 that aims to collect payments online. The government has paid off a large amount of tax arrears, which accounts for part of the 60% rise in income in just two years after the program's launch.

According to research conducted by Chiamaka et al. (2021) in South Africa, revenue collection is being hindered by billing issues, whereas in other African nations, revenue collecting is facing problems due to a lack of technology. Chiamaka went on to say that the two problems are related because most African municipalities still use paper invoices for metered services, and even though electronic billing systems are available in South Africa, there are problems with their implementation when it comes to billing and metering services, which leads to inaccurate bills.

According to Agrawal (2022), a service provider's revenue streams may be quickly improved by enhancing billing and collection strategies. The author contends that monthly volume-based charging is essential for effective water and sanitation service supply. Consumers may thus pay only for the goods and services they really use. The most efficient way to accomplish this is to implement full metering of all consumer connections. Immediate gains in income may be achieved with the use of these principles-based efficient billing and collection operations. Incentives for service providers to efficiently

charge and collect payments can be set by this commercial approach. Customers' records, pricing and billing systems, bill distribution, and payment processing infrastructure are other essential parts. Particularly, suppliers must have up-to-date, strong, and digital client databases. Spot billing is one example of how better technology is simplifying the billing operation, which in turn improves collection efficiencies and, ultimately, revenue levels. Keep in mind that whether or not such practices can be sustained over time depends on the institutional frameworks within which service providers function and deliver their services. If there is a lack of capacity in the near future, it could be beneficial to hire private parties with experience in billing and collection to handle tasks.

The Financial and Fiscal Commission (FFC, 2020) maintained that inadequate billing is an issue for all municipalities, not only smaller or rural ones, and that the City of Johannesburg was no exception when it came to billing issues. Given their lower income bases and dearth of financial means to acquire robust billing systems, one may argue that rural or smaller towns face even more formidable billing issues than metropolises. Having said that, Mahlatji and Mofokeng (2021) said that incorrect monthly invoices, which lead customers to be hesitant to pay for services consumed, are one of numerous variables that create problems with municipal billing systems.

The reliability and validity of municipal billing systems, according to South African Local Government Association (SALGA, 2021), hinge on the data used to power them. In addition, according to FFC (2020) erroneous data might jeopardize the overall revenue collection and invoicing setup. So, it's reasonable to assume that local governments might benefit from data management systems if they wanted to have better tools for invoicing and collecting taxes.

A timely delivery of account statements to the appropriate clients depends on online billing systems that accurately display critical information, including billing and customer data. In order to be dependable, a municipal billing system needs to be able to do things like generate and show exception reports, accounts that are overdue and disconnection reports (SALGA, 2021). Municipalities can reduce customer non-payments by promptly addressing these exclusions.

The South African local government system might be brought to its knees by erroneous and unfair municipal billing systems, according to Mahlatji and Mofokeng (2021). Yet, SALGA discovered in their research that the majority of city billing systems can handle complete revenue management. It was found that in multiple municipalities, the billing systems were not set up to handle fundamental needs like exception reports, which is why SALGA expressed concern about the fact that the efficiency of billing systems relies more on the administrative capacity of municipalities than on their technical infrastructure. Reiterating what Mafuwane (2025) says, the critical component influencing better municipal income management is the municipality itself taking action to enhance internal capabilities and processes.

Study results from Iravonga et al. (2023) showed that EBMs allow revenue authorities to track official business activities, which might lead to better tax compliance. There has been minimal benefit to tax collection via EBMs as enterprises can opt not to send receipts or issue fraudulent receipts, therefore EBMs do not provide legally objective tax reporting. A large number of government agencies and other groups have already stated their approval. When paying bills, many people choose to use electronic billing because of all the advantages it offers. Two methods exist for electronic billing: biller direct and bank

aggregator. Buyers pay the biller directly in biller direct, and the biller then sends the customer their invoices via the chosen website. According to research by Chandawarkar, et al. (2024) and Al-Anezi (2024), the majority of biller sites rely on electronic billing providers that are experts in the field of payment processing and electronically billing.

A research conducted by Fu et al. (2022) on the topic of electronic billing and revenue collection found several benefits to this method of payment. Payment of bills using electronic means is more cost-effective and less harmful to the environment. Both the sender and the receiver will appreciate the lack of distractions. Better for customers and more efficient than the old-fashioned billing approach. While billing, billers need only worry about efficient bill dispatch, not payment methods. You may access electronic payment at any time for your consumers. Payments made electronically are easier to trace for both consumers and businesses.

An analysis by Chiamaka et al. (2021) found that Internet Billing offers much more than just a cheaper and more convenient method of sending bill information. Online billing, according to experts, will revolutionize customer service. Customer self-care, automated sales, and one-to-one marketing are just a few of the ancillary services that the Internet Bill will eventually provide as an interactive landing page. With the Internet Bill, businesses and consumers will be able to conduct direct electronic conversations. Based on research by Bharadwaj and Baruah (2021), billing systems make use of databases to store several types of client data, including consumption logs, rate tables, and billing records that are prepared for invoicing. Billing system essentials include usage record creation, event processing, computation of bills, customer service, payment processing, bill rendering, and management reporting. There are a lot of different corporate processes

that rely on billing systems for information sharing beyond only the fundamental tasks. These include marketing, sales, customer service, finance, and operations.

2.3.2 Online Receipting Process and Revenue Collection Performance

The study by Njau (2022) looked into the possibility of automating DC's revenue collecting. Our survey included 63 of the 65 factories that were within management's purview. The effect of the online receipting procedure on consumer happiness was the subject of a primary data collection effort among production managers. In industrialized nations, the study indicated that organizations' performance improved after implementing technological changes to their online receipting processes. With online receipting, the sender and the receiver may have trustworthy online contact, which is an improvement over the old-fashioned receipting method. Researchers concluded that in order for a receipt exchange to be legitimate, both the sender and the recipient must obtain confirmation of the receipt's successful or unsuccessful transmission.

Nsangu and Haabazoka (2024) found that organizations in Zambia saw an improvement in their performance after implementing technology for online receipting. Thanks to the increased opportunity for trustworthy online contact between the payer and the receiver, online receipting is an improvement over the old-fashioned manual receipting method. According to research by Nkote and Luwugge (2020) on the topic of automation in customs tax administration in Uganda, there is a positive correlation between the two in terms of efficiency and cost. Sharma et al. (2025) said that automation streamlines the process of collecting taxes and decreases the need for taxpayers to contact with employees, eliminating a potential source of corruption.

In their study on the financial performance of Kenyan county governments, Sande et al. (2023) examined the interplay between public engagement, automated revenue collecting systems, and budgeting methods. Researchers in Nairobi County came to the conclusion that the online receipting procedure has a major impact on business efficiency. Online receipting facilitates electronic contact between two parties, as opposed to physical receipting, as the research also shown. Additionally, Nsangu and Haabazoka (2024) noted that conventional tax collecting relied on manual, centralised processes rather than automated technology. In the past, municipal governments relied on manual techniques of collecting income, which involved issuing receipts by hand. Without proper technological solutions, a huge expansion of the present tax base exacerbated problems including high collection costs, fraud, underpayment, and revenue leaks.

Digital taxation has achieved significant progress, which is good news for both taxpayers and tax authorities (Chiamaka et al., 2021). The elimination of errors and less administrative checking are efficiency gains. Effectiveness gains include having e-tax services available anytime and anywhere, automatic confirmation of return and payment receipts, more people to be deployed to the front line, personal portals for taxpayers, and easier and faster form completion. The efficiency of the system has also been attributed, according to tax officials, to a rise in employee motivation.

A certified receipt service's primary objective is to facilitate trustworthy online payments and to streamline electronic communication between parties in comparison to paper receipts (Nthenge, 2020). The receiver may be certain that the online payment is genuine and not a malicious phishing effort because this service is accessible only to acknowledged and verified individuals. In addition to the transmission of documents, this

communication also encompasses the exchange of receipt messages. According to Owino et al. (2020), this service is helpful for individuals, companies, and government agencies when they make online payments. At least these things must be guaranteed by a certified receipting procedure. Before anything else, the sender and the receiver must be able to certify reception success or failure (Sande et al., 2023) since this ensures that the origin and receipt exchange are legitimate.

An increase of one point in online receipting would result in a rise of 0.148 points in organizational performance, according to research by Adenya and Muturi (2017). Researchers in Nairobi County came to the conclusion that the online receipting procedure has a major impact on business efficiency. The findings are in accordance with those of Mutio (2022), who found that developed-world organizations' performance improved after implementing technological changes to their online receipting processes. Additionally, the study discovered that trustworthiness, legitimacy, and efficiency of online communication, as well as the declaration's efficacy and effectiveness, had a substantial impact on organizational performance. Online receipting facilitates electronic contact between two parties, as opposed to physical receipting, as the research also shown. Additionally, the study raised doubts about the legitimacy of online payments and if they were not abusive phishing attempts. It was also found that online receipting did not guarantee that the material was valid or unmodified.

2.3.3 Online Payment Process and Revenue Collection Performance

Adegbie et al. (2022) conducted an empirical study in many states in southwestern Nigeria to determine the effectiveness of tax revenue collection in relation to computerized tax administration systems. This study used a survey research methodology and a complete

enumeration sampling approach. A total of 2670 structured questionnaires were sent out to respondents in the three chosen states for the purpose of collecting replies; 2199 of these were returned, representing an 82.4% response rate. The dependability was in the range of 0.7 to 0.9. A well-structured questionnaire was used to collect data. In order to analyze the data, descriptive statistics and inferential statistics (multiple regression) were employed. Taxpayers' perceptions of the ease with which they could file their returns were significantly influenced by the electronic tax management system's performance on measures of perceived ease of use, internet payment system, mobile payment system, and electronic billing machine. The study found that the effectiveness of tax revenue collection was affected by the computerized tax administration system.

In an effort to better understand the factors influencing users' payment choices in Delta Municipality, Lavanya and Shrivastava (2024). examined the adoption of digital payment systems. The researchers also hoped to find a correlation between users' payment choices and demographic variables such as age, income, education, and sex. The study's findings corroborate the rise of plastic money in Greece following the establishment of capital controls, as they demonstrate the widespread dominance of debit cards across all age groups and income levels, for both physical and digital transactions. In addition to the new tax-free building regime, plastic money serves as a contemporary requirement due to its speed, directness, and ease as a payment method. In addition, the rewards schemes offered by most cards are rather alluring.

The impact of electronic payment systems on the long-term sustainability of Nairobi City County Government's revenue collection was examined by Chepkoech et al. (2022). The results showed that using a mobile payment method improves income gathering. Research

shows that county governments may increase their income collection with the use of mobile payments, online banking, and electronic wallets. According to the study's findings, the County government minimizes the risk of fraud associated with manual transaction processing by utilizing a mobile payment system. According to the research, the county administration of Nairobi is able to collect more money thanks to online banking. Electronic banking payment solutions are convenient for both the business and its clients, according to the research. The study also found that the county government must work with other entities, including banks, to process payments. This is because these entities have established and widely utilized payment systems, making this collaboration vital. Additionally, the study suggests that the Nairobi City County government should reevaluate its revenue collection standards to make sure that all of its departments, wards, and related units are required by law to use an electronic banking payment system and to manage their revenue collection system better. Standards and a framework for the use of electronic banking payment systems should be put in place in Nairobi City County.

Ejiku (2019) looked into how the Uganda Revenue Authority's revenue collection performance changed after switching to an electronic tax system. Specifically, the study determined how the Uganda Revenue Authority's electronic tax system relates to its revenue collection performance, how the internet payment/filing system and mobile payment/filing systems affect revenue collection performance, and how electronic billing machines affect revenue collection performance. The research team decided to use a descriptive survey approach and polled 90 people. The domestic tax department of the Uganda Revenue Authority was the source of the respondents. The respondents were chosen using simple random selection, and data was collected using well-designed

structured questionnaires. With a mean value of 4.26, the results demonstrate that taxpayer registration is facilitated by the online payment/filing system. The mean score of 4.09 indicates that customers may pay their taxes conveniently from any location using their mobile phones. Also, as shown by the mean of 4.23, using electronic billing devices speeds up the processing of accounting and financial paperwork. Additionally, a strong positive correlation ($r = 0.977$, $P < 0.01$) exists between the performance of revenue collection and the computerized tax system.

According to research conducted in Kenya by Kinyanjui and Kahonge (2014) mobile parking services that accept payments made through mobile phones saw an increase in their revenue collection rate. It did not address the penalty payment system, but it did suggest creating an app to manage traffic, parking, and resource distribution on Nairobi streets. The research by Muema et al. (2014) made a strong case for electronic payments in Nairobi County's parking sector through the use of a mobile parking management system, while the authors were also aware of potential roadblocks. In contrast to the present study, the previous one did not detail the precise methods for removing these obstacles.

A growing correlation between information systems and the effectiveness and efficiency of revenue mobilization was found by Owino et al. (2020). Their one remark was that authorities resisted automation, which slowed down the rollout of the information system. After reviewing the pros and cons of using mobile parking organizing systems in Nairobi city's car-park businesses, Muema et al. (2014) concluded that current e-payment services were the way to go due to their convenience and ability to boost revenue mobilization. Additionally, Kinyanjui and Kahonge (2013) found that the amount of money that could

be collected was higher when fees were paid electronically using mobile phone technology.

Modern electronic payment systems, like smart parking services, make it easier to collect payments by using mobile devices, which in turn boosts revenue collection efficiency and gives businesses an advantage in the market (Muema et al., 2014). According to Wang and Wenbo (2013), but when it comes to electronic payment implementation, Kenyan county governments are facing an increasing obstacle. Online banking is still relatively new in Kenya, hence there is a lack of data and research on the topic.

Nairobi County and the parking sector were prepared to implement the mobile parking management system, according to Wako et al. (2023), despite the fact that it would encounter some obstacles that may be resolved. A study conducted by Kinyanjui and Kahonge (2013) found that the service's income was raised when parking fees were paid using mobile phone-based e-payment technology. But, as a present-day problem for all drivers in Nairobi, there is a need to develop application software to help manage traffic flow, allocation, and the availability of parking spaces on city streets. Although the impact of electronic payments on revenue collection was not explicitly addressed in Nyongesa's (2014) research, the author concluded that automation of revenue collection systems would significantly boost revenue collection. The Mombasa County Government should automate its income collection, according to the research, although the report doesn't say which technology to employ.

While Chaepkoech et al (2022) discovered that governments may influence e-payment usage rates by offering incentives to use online transactions and/or penalties for using manual methods, they were unable to demonstrate that e-payments were successful in risk

management. Most county governments planned to enable online payment of utility bills, fees, and penalties, according to a research by Bland et al. (2024). Governments are interested in using e-payment systems, according to Dinh, (2024). One major obstacle to the expansion of e-commerce in Kenya, according to research by Achiando (2018), was the absence of acceptable e-Payment options. The use of third-party suppliers has enabled counties without substantial ICT resources to build an online ticket-paying system, as Perlman (2001) demonstrated.

County governments in Kenya have improved tax collection by dealing with corrupt officials through the implementation of an e-payment system. According to Ngotho and Kerongo (2022), due to widespread corruption and the use of antiquated methods of tax collection, county administrations lose an estimated 40% of their collected funds each fiscal year. Machakos, Kiambu, and Nairobi County governments have all seen improved financial performance because to the introduction of electronic payment systems, which have resulted in significant cost savings and increased revenue collection. One of the primary reasons why the e-payment system was not more widely used was because there weren't enough point-of-sale terminals at retail locations, according to Dinh (2024). Although e-payment systems are widely considered as advantageous by both people and companies, these factors impacted how easy they were to use. Electronic payment point of sale terminals should be widely distributed to retailers and consumer education should be prioritized, according to the research.

2.3.4 Online Response and Revenue Collection Performance

There has been an uptick in tax collection by the KRA, which accounts for 93% of total revenues. The theories of systems, change management, and institutional theory provided

the theoretical basis for the survey. The study found that local tax evasion and financial constraints make tax collection difficult. Corruption and inefficient enforcement mechanisms are other administrative concerns. The research found that KRA's usage of online support services has a major effect on its revenue collection. Automating revenue collecting methods allows for efficient public and customer feedback, which enhances revenue management, according to the research. According to the research, online response and feedback systems lead to higher rates of taxpayer compliance. But the study's authors drew the conclusion that online response systems are a need to help people comply and pay their taxes, especially if they're having trouble doing so. There is a lack of contextual information because the study was done on a nationwide basis using KRA instead of a county level.

Embracing the use of the internet and working with the County ICT department, the County has doubled the revenue collected by ksh 16,688,472 in the month of January 2023 compared to December 2022 (Wako et al., 2023). Through the ICT Department, the County first started by creating payment links and dial codes for accessing the services in October 2022, then piloted them in the following locations: Car packing in Murang'a town, marketing in Mukuyu Market, hospital services in Muranga'a level 5 and quarry at kandundu. The hospital services include Lab tests, x-ray, ward admission, and buying medicines at the hospital pharmacy. To register single business permits, residents don't need to visit the County offices, by clicking the e-portal one can apply for a business permit and print the documents in the nearest cyber café (Nyangito et al., 2022).

Data input, processing, computation, and analysis may all be automated through revenue collection automation. Tax reports and feedback needed for control and risk management

can also be produced automatically (Kusimba et al., 2024). The development of powerful computer programs to do tax assessments and calculations, as well as to ascertain tax dues at high levels of speed and accuracy, is an integral part of automating tax collection (Bludnik, 2023). According to Mallick (2021), automation is a driving force behind the modernization of tax collecting.

Automated online response revenue collecting involves handling customs paperwork using the electronic processing of data sent via a computer. The addition of payment and accounting allows for the registration and accounting of payments made by importers and exporters. Risk management, on the other hand, identifies shipments that pose a greater threat, such as those involving the concealment of duty and tax noncompliance, the illicit importation of narcotics or equipment bound for terrorist operations, and so on.

According to Pacella et al. (2024), the Contact Centre (CC) is an additional program that encourages excellent customer service; clients communicate with us by phone or social media in order to have their issues addressed. Building confidence between taxpayers and revenue authorities is another technique customer-centric services may improve revenue management. Customers are more inclined to follow the rules when they believe their opinions matter. Mbevi (2022) states that this promotes compliance based on voluntary efforts.

Adhikary et al. (2021) state that in order to avoid tax arrears, county governments can implement efficient revenue collection by notifying taxpayers via electronic means two to three weeks before to the due date of taxes. Citizens and county government can work together in peace when taxpayers file their returns on time and when there are fewer anomalies and discrepancies in the income collected.

Providing customer-friendly and hassle-free services is one way that revenue departments may increase tax compliance, goodwill, and mobilization (Omido, & Kasibo, 2021). Revenue agencies may improve customer service, foster loyalty, and boost revenue collection by making taxpayers their first priority (Cairo & Urio, 2020). The public has a tendency to perceive tax administrations as being unapproachable. The customer-taxman relationship has been impacted by this perspective on several occasions (Mallick, 2021). This can have an impact on the client's ability to pay their taxes in the future. But revenue agencies may reverse this attitude and enhance tax collection by adopting a customer-centric strategy (Aliyu et al., 2022).

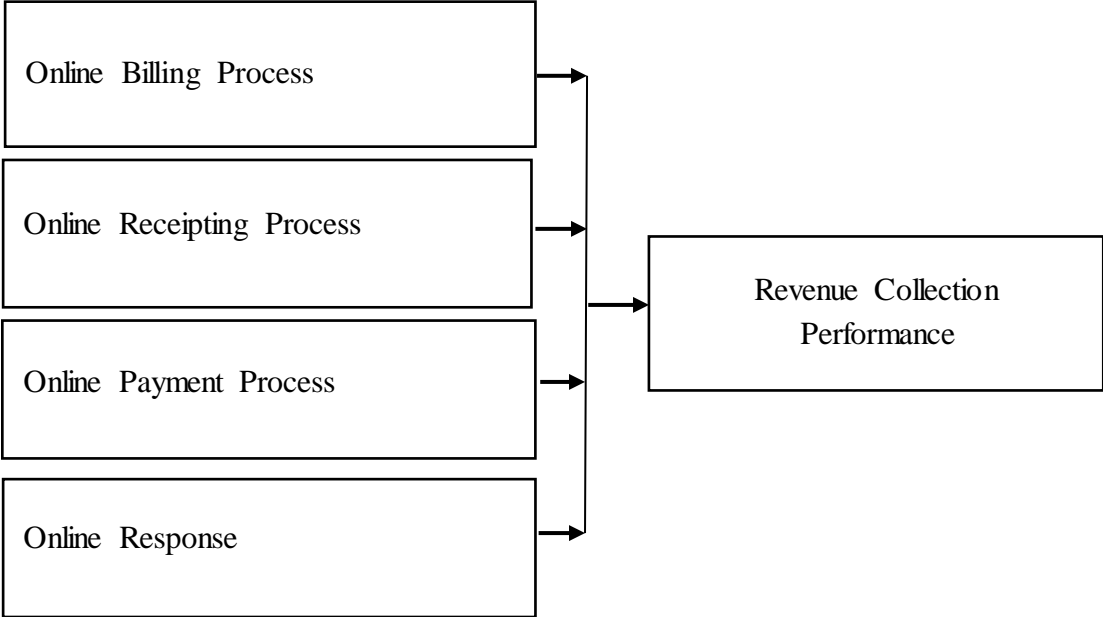
Researchers Iravonga et al. (2023) looked at how county governments in Kenya handled their finances after implementing revenue systems for integrated financial management. According to the results, tax data input, processing, computation, and analysis may be done automatically through automated tax collection. Tax reports and feedback needed for control and risk management can also be produced automatically. One aspect of automating tax collection is creating computer programs that can quickly and accurately calculate and assess taxes, as well as identify the amount owed, all while providing a prompt response to the receiver. The modernization of customs is accelerated and stimulated by automation.

2.4 Conceptual Framework

The graphical representation depicted in Figure 2.1 illustrates the interconnections and associations between variables within the scope of the research. A variable may be defined as an entity that possesses a value that is subject to change or variation (Tabachnick & Fidell, 2020).

Figure 2.2:

Conceptual Framework



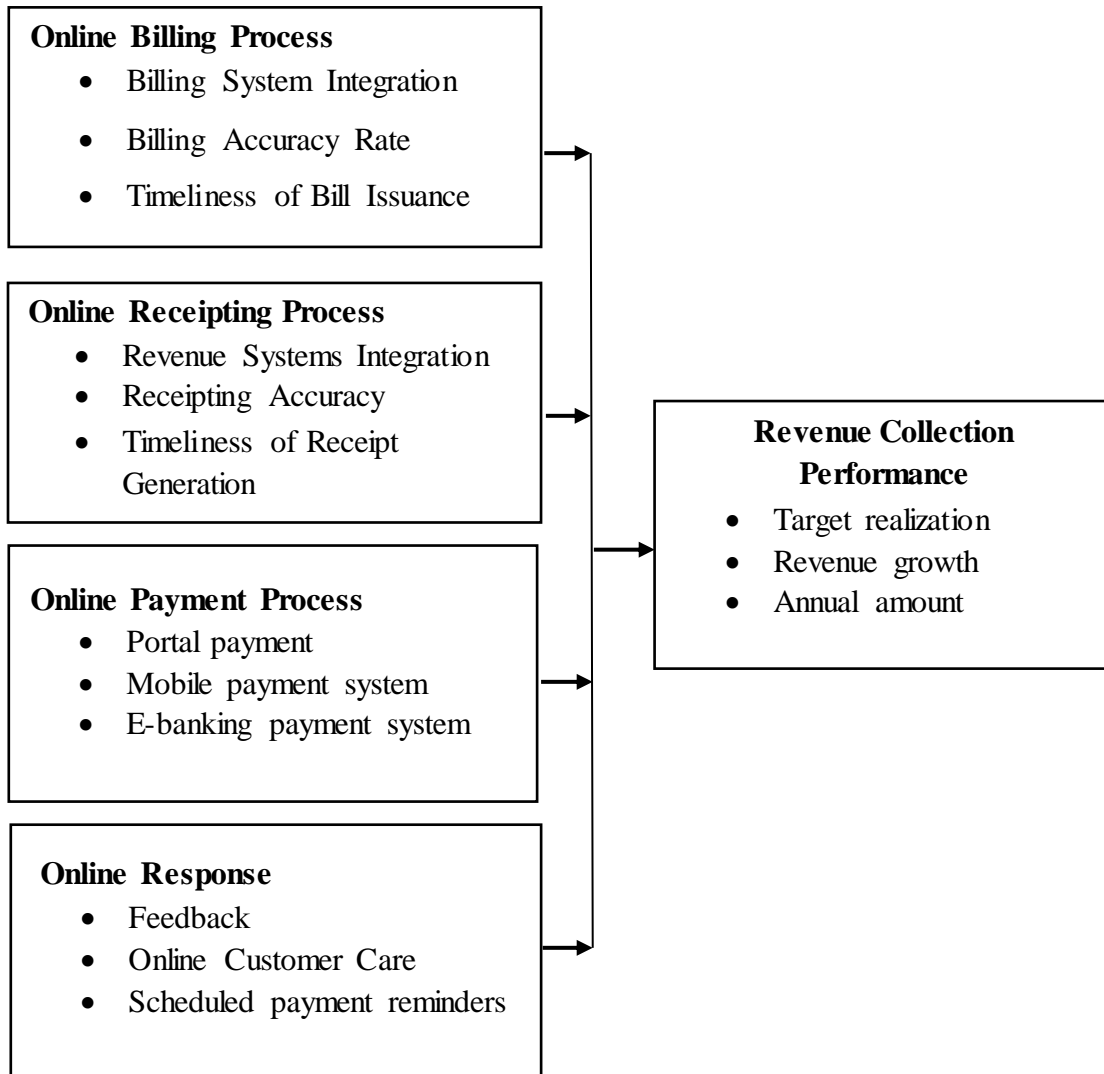
Independent Variables

Dependent Variable

2.5 Operational Framework

Figure 2.3:

Operational framework



Independent Variables

Dependent Variable

2.6 Explanation of Variables

The framework explains the relationship that is there between the dependent and independent variables.

2.6.1 Online Billing Process

Electronic billing has been around for a while, says Achieng et al. (2022). Even while most people still get paper invoices sent to them by the normal Postal Service, an increasing number of people are opting to pay their bills online over the Internet. Presentment of bills electronically is a novel idea in the field of electronic billing. Electronic bill presentment allows billers to upload customer statements online so that customers may examine them and pay online (Musiega et al., 2023).

Many public sector organizations, especially cities, rely heavily on billing operations to generate money. For instance, billing is the lifeblood of public service delivery since it generates revenue and serves as the primary information hub for service recipients (Kagabo, 2021; Mbevi, 2022). Improved revenue collection has resulted from a combination of streamlined billing procedures and enhanced collection mechanisms in several nations (Mei, 2020).

According to Mallick (2021), invoicing serves as the primary means of generating revenue and gathering information about customers in regard to service delivery. Therefore, billing is essential to a municipality's success. Regular and accurate billing of consumers is essential when a large portion of a municipality's revenue is derived from the provision of services. The likelihood of receiving payment increases when invoices accurately represent the services provided and their amount (Lyimo & Makilully, 2022).

Periodic billers, such as telephone companies, electricity companies, etc., are finding a new sort of service area with the ever-expanding Internet: bill presentation and payment.

Customers (payers) get individualized assistance through an online bill presentation and payment system, which turns billing centres into revenue centers (Kanini, 2021). Online bill payment and presentation systems allow for more direct, tailored contact between billers and payers, as well as the creation of new revenue streams through cross-selling ads. Significant savings compared to traditional paper billing methods (Ouyang et al., 2023).

2.6.2 Online Receipting Process

Moving your receipt management operations to the cloud is what Online Receipt Management is all about. Its purpose is to get over the problems and restrictions of using paper and spreadsheets (Owiti, 2022). You can get a better picture of your spending habits and the process as a whole using online receipt management systems. It is possible for county governments to use digital or automated solutions to cut down on the time and money spent on each invoice. Online Receipt Management is useful in this situation (Sokobe, 2021).

Verification is necessary to ensure accuracy of payments and maintenance of payment conditions. Errors, such as the incorrect account number, are manually checked for by the Accounts Payable staff on each receipt (Mutiso & Maguru, 2020; Nyamiaka, 2021). The primary objective of digital receipts is to offer customers comprehensive information about their purchase history in a safe, traceable, and dependable electronic format, thereby replacing paper receipts (Owino, 2023).

The digital receipt is considered evidence of a hand-written transaction, as stated by Jepkoech (2021). The processing time and reconciliation are both affected by the technical issue of duplicate records. The recording of transactions, reconciliation, and financial

report creation are all impacted by the receipts of all platforms. Because they are comprehensive, accurate, easy to use, efficient, and suitable for the intended purpose, digital receipts inspire a great deal of trust (Mbevi, 2022).

2.6.3 Online Payment Process

It is becoming more and more possible for county governments to receive money for services and perform all other business online. Everyone benefits greatly from this digitalization, from residents to employees (Kamara, 2021). Your constituents can benefit greatly from online payments. According to Musiega et al. (2023), accepting payments online not only frees up your constituents' time by removing the need to physically visit your department and any paperwork-related waits, but it also expands your business hours. Ndunda et al. (2020) states that when you accept payments online, your department may do pre-authorization. This is great since it allows you to process payments only after they are accepted, saving you time and money because you won't have to chase down the cash.

There were transactional gains linked with the implementation of e-payment, as pointed out by Nyamiaka (2021). The electronic payment streamlines every kind of transaction. The e-payment technology has enabled the full purchase cycle, from requesting to paying online. Many people have found that making payments online is much more efficient and saves a lot of time. Bharadwaj and Baruah (2021) state that faster revenue collection is the result of more convenient payment choices offered by online payment processes. Customers won't have to pay anything if you cut back on your own payment processing expenses. Moreover, improved government technology can pave the way for constructive citizen-government interactions, which in turn can increase the efficiency of tax collection.

2.6.4 Online Response

Online automated revenue collection refers to the management of documents using computer-assisted processing of electronically submitted information. Ouyang et al. (2023) argue that the Contact Centre is a strategic effort aimed at enhancing customer service. Customers engage with us via phone calls or social media platforms to have their service requirements efficiently addressed. Furthermore, customer-centric services can enhance revenue management by fostering a feeling of confidence between taxpayers and revenue officials. When taxpayers see that their input is acknowledged and taken into account favorably, they are more inclined to adhere to tax rules and regulations. This principle promotes voluntary adherence (Mbevi, 2022).

According to Adhikary et al. (2021), county governments can enhance revenue collection by using E-reminder notifications to taxpayers 2-3 weeks before to tax collection deadlines to guarantee the absence of tax arrears. The timely filing of tax returns by taxpayers serves to minimize anomalies and discrepancies in the money received, therefore fostering unity between residents and the county administration.

According to Kusimba et al. (2024) the utilization of online support services by the KRA has a substantial influence on its revenue collection. The study revealed that the automation of revenue collecting processes enhances revenue management by facilitating effective incorporation of customer and public input. The study demonstrates that the use of online response and feedback systems leads to an increase in compliance levels among taxpayers. Nevertheless, the study determined that the integration of online response

systems is necessary to streamline adherence and provide guidance for those who may have difficulties in complying with tax obligations.

2.6.5 Revenue Collection Performance

The performance of revenue collection is measured by the difference between the target revenue and the actual revenue collected. The effectiveness of county service delivery and economic growth depend on high tax collection performance (Maswadeh & Hanandeh, 2020). Cairo and Urio (2020) state that in order to attain compliance and correct revenue information, it is necessary to collect income. The collection of all owed revenues at the specified times indicates a high level of revenue compliance. In order to improve service delivery and economic growth, it is necessary to increase the degree of tax compliance (Olatunji, 2021).

International Monetary Fund ([IMF] 2017) argues that there are perks to collecting overdue taxes, such as making public services more efficient and, ultimately, achieving better results in revenue collection. The success of revenue collection will be evaluated by comparing actual revenue collected with the projected budget. Revenue collection compliance levels were the primary determinant of revenue collection, as stated by Ngotho and Kerongo (2020).

The ability of county governments to collect taxes has a negative impact on citizen empowerment, socioeconomic growth, and the sustainability of services provided. . County governments' ability to collect taxes, provide services, and foster economic growth are all negatively impacted by falling tax revenues (Lyimo & Makilully, 2022).

2.7 Research Gap

Existing studies have acknowledged the critical role of electronic payment systems in strengthening government revenue administration, yet most have focused on broad national tax regimes or sector-specific institutions, leaving gaps in the context of county governments. For instance, global and regional research often emphasizes how automation enhances compliance and efficiency in revenue collection, as seen in advanced economies and some African countries (Moore et al., 2018; UNCTAD, 2020). However, these studies rarely interrogate how such systems influence performance in devolved government structures where resource capacities, user adoption, and enforcement mechanisms differ significantly. This creates a contextual gap since counties operate under unique fiscal and administrative realities compared to central governments.

Empirical studies in Kenya have also highlighted the benefits of electronic payment platforms such as iTax and mobile-based systems, with evidence of improved transparency and reduced leakages in Nairobi, Machakos, and Kiambu (Chepkoech, et al. 2022 ; Kinyanjui & Kahonge, 2013). Nonetheless, much of this work has concentrated on the adoption of technology rather than on whether such adoption translates into improved revenue collection performance against set targets. Moreover, while studies have investigated taxpayer perceptions and organizational efficiency, they have often overlooked the specific processes of online billing, receipting, payment, and response, which are critical in shaping outcomes at the county level. This reveals an empirical gap in linking the components of electronic payment systems to measurable performance indicators such as revenue growth, accountability, and service delivery.

In addition, limited research has been conducted in counties like Kajiado despite their heavy reliance on Own Source Revenue to fund devolved functions. Reports from the Controller of Budget (2022) indicate persistent underperformance in OSR collections, yet academic inquiry has not fully examined how electronic payment initiatives influence this trend. Prior studies tend to generalize findings across counties without addressing county-specific dynamics such as infrastructure capacity, taxpayer behavior, and administrative enforcement. This leaves a practical gap that this study seeks to fill by providing county-level evidence on the effect of electronic payment systems on revenue collection performance in Kajiado County. By doing so, the study not only addresses contextual and empirical gaps but also contributes to the broader theoretical discourse on how technology adoption intersects with fiscal performance in decentralized governance structures.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section detailed the procedures and methods that were employed over the course of the study. Data collecting strategies and techniques, as well as a well-defined respondent population, formed the backbone of every significant study. It encompassed a comprehensive system, strategy or framework developed to help the researcher achieve the outlined objectives. Subsections in this chapter covered topics like study methodology, populations of interest, sampling strategies, data collection and analysis and interpretation.

3.2 Research Design

The concept of research design was commonly understood as a strategic framework that guided the process of conducting investigations in order to obtain meaningful responses to a range of research inquiries (Allan & Skinner, 2020). According to Bickel (2020), this document was considered the guiding framework for the gathering, measurement, and analysis of data. Its objective was to facilitate the derivation of inferences and the formulation of conclusions. In accordance with this, the present study employed a descriptive research design. The utilization of a descriptive research design was commonly observed in investigations that sought to determine the specific location and manner in which a phenomenon occurred. The utilization of a descriptive research approach was deemed suitable for this study, as it aimed to examine the effect of electronic

payment systems on revenue collection performance of counties in Kenya, specifically in the case of the county government of Kajiado.

3.3 Target Population

A population refers to a complete assemblage of goods, events, or objects, which have a common observable and quantifiable attribute. Hence, the population may be defined as the collective whole of entities that adhere to a given set of criteria. The process of sampling involves accurately delineating the specific target population (Zhu, et al., 2020). According to Mehmetoglu and Jakobsen (2022), it is imperative to have a clear definition of the target audience, including elements, geographical borders and time. The target population refers to the entirety of certain population components that are the focus of the investigation. The target population for this study consisted of 195 respondents comprising of Executive Committee Members, Finance, Head of Departments, Finance and Accounts Officers and Revenue Collection Officers. The reality that revenue collecting affects and cuts across several county agencies motivated this strategy. The selected responses provided crucial information, especially regarding revenue collection guidelines, compared to staff in general.

The choice of Kajiado County presented a particularly relevant case for studying the effect of electronic payment systems due to its unique blend of urban and rural populations, which allowed for a comparative analysis of system adoption in different socio-economic settings. The county government of Kajiado's adoption of the electronic payment system aligned with Kenya's broader push for digital governance under devolution, making it an exemplary model for other counties looking to modernize their revenue collection processes and improve financial management.

Table 3.1:

Target Population

Staff Category	Frequency
County Executive Committee Members-Finance	16
Head of Departments	10
Finance and Accounts Officers	63
Revenue Collection Officers	106
Total	195

Source: Human Resource Department Kajiado County Government (2023)

3.4 Sampling Frame

The sampling frame refers to any item or equipment that is utilized to get observational access to the limited population under study. According to Ghauri and Gronhaug (2020), the utilization of the framework enables the identification and establishment of communication with certain aspects using various means such as telephone, in-person visits, or questionnaires. The sampling frame refers to an all-encompassing inventory of all potential sampling units from which a sample might be chosen. The sampling frame to be utilized in this study was obtained from the Human Resource Department Kajiado.

3.5 Sample Size and Sampling Procedure

Sampling refers to the process of selecting a subset of units from a larger population (Golder & Golder, 2021). Sampling may be described as the process of selecting a subset of a population in order to make inferences about the characteristics of the entire population. This study adopted stratified sampling where respondents were classified into

Executive Committee Members, Finance, Head of Departments, Finance and Accounts Officers and Revenue Collection Officers from which proportionate sampling was done to provide a sample size for each strata where simple random sampling was eventually used pick the elements for study. The consideration of sampling was crucial in assessing the generalizability of study findings. The utilization of stratified random sampling was planned for this study in order to pick respondents for the sample.

The choice of Yamane's formula was based on its practicality and efficiency in generating an adequate sample size while balancing accuracy and feasibility. By applying a 95% confidence level and a 5% margin of error ($e = 0.05$), the formula provided a scientifically defensible basis for the number of respondents required to capture reliable insights from the target population of 195. According to the Yamane formula (1967), the size of a sample for a particular study is calculated as follows:

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

Therefore, the size of the sample based on the formula is depicted in equation below;

$$n = \frac{195}{1+195(0.05^2)}$$

$$n = 131$$

Table 3.2:

Sample Size

Staff Category	Sample Size
County Executive Committee Members Finance	11
Head of Departments	7
Finance and Accounts Officers	42
Revenue Collection Officers	71
Total	131

3.6 Data Collection Instruments

3.6.1 Primary Data

The collection of primary research data was conducted through the utilization of a standardized questionnaire. A structured questionnaire is characterized by predetermined questions that are carefully selected in advance. In this scenario, the researcher determined the questions beforehand, arranging them in a logical sequence based on the themes under investigation. Additionally, items that are likely to elicit similar responses will be grouped together (Mehmetoglu & Jakobsen, 2022). The survey instrument consisted of closed-ended questions and a tailored five-point Likert scale. This methodology employed to gather data on the variables of investigation from the managerial participants. Participants were requested to express their level of agreement for each item using a five-point scale, where 1 represents strong disagreement, 2 represents disagreement, 3 represents neutrality, 4 represents agreement, and 5 represents strong agreement.

The questionnaire was partitioned into two distinct sections. Part I consisted of inquiries regarding the information of the company or respondents, whilst Part II had questions

pertaining to both the dependent and independent variables. The questions were designed in a manner that effectively addresses all the goals outlined in the research.

3.6.2 Secondary Data

Secondary data for assessing the impact of electronic payment systems on revenue collection in Kajiado County was collected from various reliable sources, including government reports, academic studies, and financial databases. Key sources included reports and publications from the County Government of Kajiado, which provided detailed information on revenue collection performance before and after the implementation of electronic payment systems. These reports were expected to include annual budgets, financial statements, and performance audits. Data was also gathered from national agencies like the Kenya National Bureau of Statistics (KNBS) and the National Treasury, which provided county-specific economic and financial data. Furthermore, secondary data was obtained from research studies published in academic journals, which analyzed revenue collection trends and the use of technology in governance. The secondary data gathered was utilized for the purpose of cross validating the information obtained from the original data.

3.7 Data Collection Procedures

Data was gathered by means of questionnaire administration, facilitated by the research assistants. Prior to commencing data collection, the researcher provided comprehensive training to the research assistants about the substance of the questionnaire and the overall research requirements. In order to augment their practical proficiency in administering the research instrument, the research assistants followed the primary researcher during the pilot study, therefore gaining firsthand experience. In the primary investigation, the

questionnaires were administered to the participants using the method of drop-off and pick-up. The researchers and research assistants initiated contact with each respondent, introducing themselves to the appropriate participants by providing an explanation of the study's nature and objectives. Subsequently, they distributed the questionnaires to the respondents for completion and retrieve them within a two-week timeframe. Prior to distributing the questionnaire, the researcher obtained consent. The researcher further pursued extra authorization from the National Commission for Science Technology and Innovation (NACOSTI) in order to administer the questionnaires.

The researcher and research assistants also adhered to ethical issues during the study procedure. The involvement of respondents was contingent upon obtaining informed permission. The principle of informed consent aimed to ensure that participants in research are adequately informed and assured about their involvement. This enabled individuals to comprehend the potential consequences of their participation and make a fully informed, deliberate, and voluntary decision, free from any undue influence or coercion.

The researcher strived to maintain a high degree of objectivity throughout the research study process. The questionnaire was accompanied with a cover letter that outlined the study's objectives, emphasizing the need of maintaining respondent anonymity as they participate in the study.

3.8 Pilot Study

A pilot study was conducted to test the reliability and validity of the research instrument before the main data collection. This preliminary exercise was important because it helped

to identify potential weaknesses in the questionnaire such as unclear instructions, ambiguous questions, or formatting issues that might have affected the quality of responses. The pilot also allowed the researcher to test the appropriateness of the data collection process and the planned analytical approaches, while at the same time confirming the feasibility of the study design (Tabachnick & Fidell, 2020). By addressing these issues in advance, the researcher ensured that the main study would generate data that was both accurate and dependable.

To preserve the integrity of the main sample while still working with a comparable population, the pilot study was carried out in Machakos County, a neighbouring devolved unit to Kajiado. The choice of Machakos was deliberate, as its finance and revenue departments operate under structures similar to those in Kajiado, which made the responses relevant for refining the study tools. At the same time, conducting the pilot in a different county avoided contamination of the actual study population. This approach provided the researcher with an opportunity to observe the practicality of the instruments in an authentic environment, while maintaining the independence of the respondents who later participated in the main survey (Creswell & Creswell, 2021; Zhu et al., 2020).

The pilot involved 10% of the total sample size, consistent with recommended practices in social science research. The process mirrored the procedures used in the main data collection, which made it possible to estimate the time required, check the adequacy of resources, and test the effectiveness of the sampling technique. Data gathered during the pilot helped the researcher identify items that required clarification, restructure ambiguous questions, and remove items that were irrelevant or redundant. These refinements ensured

that the final questionnaire was both reliable and valid, thereby improving its suitability for the main study.

3.8.1 Reliability

The study employed Cronbach's Alpha Coefficients to assess the reliability of the questionnaire, utilizing the Statistical Package for Social Sciences (SPSS) software. The statistical approach known as Cronbach's Alpha is commonly employed to assess the reliability of measurements. The researcher employed a systematic research methodology to mitigate the occurrence of faulty coding and imprecise instructions. This procedure involved minimizing random error and critically evaluating and appraising the questionnaire to increase the reliability of the instrument.

Therefore, the dependability measure can take values between zero and one. With a value of 0, the measurement is comprised entirely of error, and with a value of 1, there is no variable error in the measurement at all. The four most common ways to determine reliability are the test-retest, parallel (or analogous) form, split-half, and internal consistency techniques. To determine how reliable the questionnaire is, the researcher used the split-half reliability test. This was accomplished by calculating the Cronbach's Coefficient Alpha. According to Ullah and Rafiq (2022), in order to maintain an item within an acceptable scale, the alpha coefficient should be equal to or greater than 0.70.

3.8.2 Validity

The validity test evaluates the correctness and meaningfulness of variations, relying on research results that accurately describe the phenomena. The determination of validity is also contingent upon the presence of systematic inaccuracy in the data (Tabachnick & Fidell, 2020). Research has indicated that the criteria of validity has utmost importance

when assessing the extent to which an instrument accurately assesses what it is intended to measure. Zhu et al. (2020) provided more clarification by stating that validity pertains to the degree to which the observed discrepancy obtained through a measuring device accurately represents the actual discrepancy among the individuals under examination.

The utilization of factor analysis was employed in order to evaluate the questionnaire's validity. Factor analysis is a statistical method that falls within the broader category of multivariate analysis. Its primary objective is to select the most significant characteristics or features from a vast array of variables, which may then be utilized for subsequent multivariate analysis (Dzwigol, 2022). The application of Exploratory Factor Analysis (EFA) was utilized to examine the scale items and establish the discriminant validity of measurement instruments developed within a study. This analysis involved assessing the Kaiser Meyer-Olkin (KMO) measure of sampling adequacy and conducting a significance test at a 95% confidence level. A KMO value ranging from 0.5 to 1.0 is considered indicative of an adequate instrument (Ghauri & Gronhaug, 2020).

3.9 Data Analysis and Presentation

The research intends to collect quantitative data by means of a questionnaire, while the study will mostly rely on primary sources of information. Use of descriptive statistics like standard deviation and mean and inferential statistics like Pearson correlation and regression analysis were part of the quantitative data analysis. The study utilized SPSS version 28 for analysis. For easier comparison and conclusion drawing, the findings were presented in tabular format. Using Pearson correlation analysis, the researcher looked at how the independent variables relate to the dependent one. Using multiple regression analysis with a significance level of .05., the researcher established the combined link

between the factors and the dependent variable. The following model was used to achieve this goal;

$$Y = B_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Y – Revenue Collection Performance (outcome as a result of changes in any or all the variables, X_1 to X_4)

' B_0 – is a constant, the results when all variables X_1 to X_4 are zero.

X_1 – Online Billing Process

X_2 – Online Receipting Process

X_3 – Online Payment Process

X_4 – Online Response

' b_1 – b_4 – Regression coefficients

ε – error term

3.10 Diagnostic Tests

Prior to performing regression, the research performed diagnostic tests to assess the assumptions. When the assumptions of regressions are not broken, most parametric tests, including regression and correlations, provide adequate findings.

3.10.1 Multicollinearity

Collinearity, according to Thomas (2022), denotes a singular perfect linear relationship between variables, whereas multicollinearity denotes several similar relationships. There is multicollinearity when two or more independent variables are highly correlated with one another, making it impossible to disentangle their effects (Jones, 2022). Since the details of multicollinearity are unknown, there is no universal metric to assess it.

Simply removing one of the highly linked variables resolved multicollinearity. Assumptions about multicollinearity in data being either sampling artifacts or accurate representations of connections in the population are made by Dawadi et al. (2021). When conducting data analysis using regression analysis, it is important to consider the following issues: the difficulty in determining the relative importance of multicollinearity variables; potentially harmful consequences, such as misleading parameter estimates based on theoretical considerations; theoretically important variables with insignificant coefficients; and estimates that fluctuate significantly due to small changes in the sample.

3.10.2 Normality

The likelihood that a sample is representative of a normally distributed population may be determined using a normality test. According to Staub et al. (2022), statistical tests for normalcy are more accurate since they use computed probabilities. To find out if a data set fits well with a normal distribution and to estimate the probability that the underlying random variable in the data set follows a normal distribution, the researcher employed normality tests.

Different probability theories allowed for various interpretations of the tests, which was essentially be models of selection. Normality tests, including skewness and kurtosis was used to examine the assumptions of many statistical processes that relied on a normal distribution. Skewness indicated how symmetrical or asymmetrical a graph will be. For a distribution to be considered symmetric, its appearance to the left and right of the central point had to be identical. The kurtosis statistic indicated the degree to which the data deviated from the normal distribution, specifically in terms of how heavy or light its tails will be. Datasets with significant kurtosis often have extreme outliers or heavy tails. The

standard normal distribution, due to its symmetry, had a mean of 0 and a standard deviation of 1. The researcher employed Kolmogorov-Smirnov (K-S) test to check for normality.

3.10.3 Homoscedasticity

The homoscedasticity statistic indicates that the variance in the error terms is constant across all observations. If there is a non-constant variation in the error term(s), the converse is true. Assumption of heteroscedasticity is made in such a situation. When the dependent variable is homoscedastic over its whole range, it means that the connection under study is constant. The absence of homoscedasticity was shown by the fact that certain portions of the inquiry have larger mistakes (residues) than others. To account for heteroscedasticity, the Levenes test was used. For this test, the researcher did not reject the null hypothesis, which asserts that the data is homoscedastic, if the p-value is greater than or equal to 0.05. Even if the BLUE property is not applicable when heteroscedasticity is present, unbiased coefficient estimates will still be produced (Bell et a., 2022).

3.10.4 Autocorrelation

The possibility of residual autocorrelation was highlighted by the linear regression assumption. When a time series is correlated with its own historical and predicted values, this phenomenon is called autocorrelation. Serial correlation, which describes the relationship between successive integers across time, is another name for this phenomenon (Fellows & Liu, 2021). The researcher utilized Durbin-Watson to test for autocorrelation in continuous time series derived from continuously collected data. According to Dawadi et al. (2021), when the residual values are not completely independent of each other, we

say that autocorrelation has occurred. This implies that the values of $y(x+1)$ rely on the values of $y(x)$.

3.11:

Hypothesis Testing

Table 3.3:

Hypothesis Testing

Hypothesis Statement	Hypothesis Test	Decision Rule
H_{O1} : Online billing process has no significant effect on revenue collection performance of county government of Kajiado, Kenya.	F-test (ANOVA) T-test $H_{O1}: \beta_1=0; H_{O1}: \beta_1 \neq 0$	Reject H_{O1} if P-value ≤ 0.05 otherwise fail to reject H_{O1} if P-value > 0.05
H_{O2} : Online receipting process has no significant effect on revenue collection performance of county government of Kajiado, Kenya.	F-test (ANOVA) T-test $H_{O2}: \beta_2=0; H_{O2}: \beta_2 \neq 0$	Reject H_{O2} if P-value ≤ 0.05 otherwise fail to reject H_{O2} if P-value > 0.05
H_{O3} : Online payment process has no significant effect on revenue collection performance of county government of Kajiado, Kenya.	F-test (ANOVA) T-test $H_{O3}: \beta_4=0; H_{O3}: \beta_4 \neq 0$	Reject H_{O4} if P-value ≤ 0.05 otherwise Fail to reject H_{O4} if P-value > 0.05

<p>H₀₄: Online response has no significant F-test (ANOVA) effect on revenue collection performance T-test of county government of Kajiado, Kenya. H₀: $\beta_4=0$; H₁: $\beta_4 \neq 0$</p>	<p>Reject H₀₄ if P-value ≤ 0.05 otherwise Fail to reject H₀₄ if P-value > 0.05</p>
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3.12 Ethical Considerations

It was important for the researcher to maintain research ethics. The researcher sought for a letter of introduction from the KeMU-Nairobi campus and permission from the National Commission of Science Technology and Innovation before carrying out the study. The researcher also followed the laid down procedures. Honesty and integrity was highly maintained throughout the study. To maintain confidentiality, the study ensured that respondents remained anonymous. The information gathered was not be shared to the competitors.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

Both descriptive and inferential analysis were utilized in the present chapter to examine the data. The study's findings are influenced by the conceptual relationship outlined in the conceptual framework. This chapter covers topics such as response rate, validity, reliability, and assumptions related to regression analysis.

4.2 Response Rate

Out of the 131 questionnaires distributed, 121 were completed and returned, resulting in a response rate of 92.4%. As highlighted by Stinchcombe (2020), a response rate of 60% is considered favorable, 70% or higher is highly commendable, and 50% is deemed satisfactory. Therefore, the 92.4% response rate achieved in this study is exceptional and aligns with expectations. This high level of participation reflects a strong interest in the study, with most respondents finding the survey experience engaging and worthwhile.

4.3 Pilot Results

4.3.1 Reliability Analysis

The Cronbach alpha values for each variable are indicated in Table 4.1. The dependability of the data collecting sheet was assessed by calculating the Cronbach's alpha coefficient. Cronbach's alpha is a statistical measure used to assess the internal consistency of a test. It determines how closely the items on the test are related to each other and to the overall test score. The coefficient ranges from 0 to 1.0, with a higher coefficient indicating a more trustworthy test .

The findings of the study reveal a strong internal consistency across all the scales used, as evidenced by Cronbach's Alpha values that meet the accepted threshold of reliability. Cronbach's Alpha is a widely used measure of scale reliability, with values above 0.7 indicating an acceptable level of internal consistency. In this analysis, all constructs exceeded this benchmark, signifying that the measurement scales were both reliable and robust for the intended study.

The Online Billing Process recorded a Cronbach's Alpha of 0.882, highlighting its high reliability. This result indicates that the items used to measure the online billing process were cohesive and accurately captured the intended construct. Such a high alpha value suggests that respondents consistently evaluated this process, reflecting its structured nature and potential role in enhancing the efficiency of revenue collection.

Similarly, the Online Receipting Process achieved a Cronbach's Alpha of 0.781, which is within the acceptable range. This finding underscores the reliability of the scale used to assess the online receipting process. The slightly lower but still strong alpha value compared to the billing process might point to variations in how respondents perceived different aspects of receipting, though the overall consistency remains robust.

The Online Payment Process recorded a Cronbach's Alpha of 0.785, confirming its reliability. This finding aligns with the increasing adoption of digital payment systems, which are often evaluated based on uniform criteria such as ease of use, security, and transaction speed. The scale's reliability suggests that these criteria were consistently applied by respondents, reinforcing the importance of streamlined payment processes in revenue management.

The Online Response scale demonstrated a high Cronbach's Alpha of 0.877, indicative of excellent internal consistency. This result suggests that respondents found the items measuring responsiveness such as the speed and quality of feedback both relevant and interrelated. The high reliability of this construct highlights its critical role in fostering trust and satisfaction among users, which is essential for the successful implementation of online systems.

Finally, the Revenue Collection Performance of the County Government of Kajiado yielded a Cronbach's Alpha of 0.862, signifying strong reliability. This finding reflects the cohesion of the items designed to measure revenue performance, encompassing factors like collection efficiency, timeliness, and comprehensiveness. The high reliability of this scale reinforces its validity as an indicator of overall revenue management effectiveness.

In summary, the high Cronbach's Alpha values across all scales indicate that the instruments used in this study were both reliable and consistent. The strong reliability of these constructs provides confidence in the study's findings and their applicability in assessing the effectiveness of online processes in enhancing revenue collection. Moreover, the results underscore the critical role of well-designed and cohesive online systems in improving operational efficiency and user satisfaction. These findings contribute to the growing body of literature on the digitalization of public financial management, particularly in the context of local government operations.

Table 4.1:

Reliability Test

Scale	Cronbach's Alpha	Comments
Online Billing Process	0.882	Accepted
Online Receipting Process	0.781	Accepted
Online Payment Process	0.785	Accepted
Online Response	0.877	Accepted
Revenue Collection Performance	0.862	Accepted

4.3.2 Validity

The results presented in Table 4.2 provide critical insights into the suitability of the dataset for factor analysis. Two statistical tests the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity are central to assessing whether the data meets the fundamental assumptions required for effective factor analysis. These tests provide complementary evidence on the dataset's adequacy and validity for multivariate analysis.

The KMO Measure of Sampling Adequacy yielded a value of 0.751, indicating that the dataset is moderately suitable for factor analysis. KMO values range from 0 to 1, with a threshold of 0.6 considered the minimum acceptable level. Values closer to 1 denote higher adequacy, meaning that the variables under consideration share sufficient common variance to justify the application of factor analysis. A KMO value of 0.751 falls within the "middling" category as per Kaiser's classification, suggesting that the sample size and variable correlations are appropriate for deriving reliable factors. This finding implies that

the dataset possesses the necessary structure to reveal meaningful underlying patterns through factor analysis.

Bartlett's Test of Sphericity further corroborates the suitability of the dataset. The test generated a Chi-Square value of 423.416 with 10 degrees of freedom and a significance level of 0.000. This highly significant result ($p < 0.05$) confirms that the null hypothesis—stating that the correlation matrix is an identity matrix—is rejected. An identity matrix would indicate no significant relationships among the variables, rendering factor analysis inappropriate. However, the significance observed in Bartlett's Test confirms the presence of substantial correlations among variables, validating the appropriateness of factor analysis for this dataset.

The combination of a KMO value above the acceptable threshold and a highly significant Bartlett's Test provides strong statistical support for proceeding with factor analysis. The results suggest that the dataset is both adequate and well-suited for uncovering latent constructs that may underlie the observed variables. This is particularly valuable in research contexts where understanding complex relationships among variables is key to deriving actionable insights.

In conclusion, the results from Table 4.2 affirm that the dataset meets the necessary assumptions for factor analysis. The combination of an adequate KMO value and significant Bartlett's Test not only validates the dataset's suitability but also provides a solid foundation for subsequent exploratory or confirmatory factor analysis. These findings enhance the credibility of the research and strengthen its contribution to understanding the phenomena under investigation.

Table 4.2:

KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.751
Bartlett's Test of Sphericity	Approx. Chi-Square	423.416
	df	10
	Sig.	.000

4.4.1 Level of Education

The distribution of educational levels among respondents provides valuable insights into the composition of the sample. The majority of respondents, 45.5%, possess an undergraduate degree, indicating that a significant proportion of the participants have attained a foundational level of higher education. This suggests that the study's sample is composed of individuals who are likely to have a solid understanding of the subject matter, contributing to the reliability and depth of the responses collected.

A notable 34.7% of respondents hold a college diploma, representing a significant segment of the population with practical and technical expertise. This group is often characterized by hands-on experience and specialized knowledge, which may offer a unique perspective distinct from those with undergraduate or postgraduate qualifications. The representation of diploma holders highlights the diversity of educational backgrounds in the study, enriching the findings with varied insights.

Respondents with master's degrees account for 14.9% of the sample. This group represents individuals who have pursued advanced education and are likely to possess

specialized knowledge and critical thinking skills. Their inclusion in the study adds depth to the analysis, as they may bring a nuanced understanding of the issues being investigated. Their relatively smaller proportion compared to undergraduate and diploma holders suggests that postgraduate education is less common among the study population, possibly due to contextual or economic factors.

The smallest group, comprising 5.0% of the respondents, consists of those with PhDs. This elite category represents individuals with the highest level of academic achievement, who are likely to contribute profound expertise and a scholarly perspective to the study. Although their numbers are limited, their insights may be particularly valuable for interpreting complex aspects of the study, as they are equipped with advanced research and analytical skills.

Overall, the sample's educational composition reflects a balanced mix of practical, foundational, and advanced academic qualifications. The predominance of undergraduate degree holders and diploma holders ensures that the study captures perspectives that are representative of the broader population, while the inclusion of master's and PhD holders enhances the study's academic rigor. This diversity in educational levels is instrumental in providing a comprehensive understanding of the phenomena under investigation, as it incorporates a range of experiences, knowledge bases, and analytical capacities.

The educational distribution also offers implications for policy and practice. The dominance of undergraduate and diploma qualifications suggests that interventions or strategies targeting this population would benefit from focusing on practical applicability and foundational knowledge. Meanwhile, the representation of advanced degree holders

indicates the potential for incorporating theoretical insights and innovative solutions derived from academic research. The findings underscore the importance of tailoring approaches to accommodate the educational diversity of the target audience, thereby maximizing engagement and effectiveness.

Table 4.3:

Level of Education

Educational Level	Frequency	Percent (%)
College Diploma	42	34.7
Undergraduate	55	45.5
Masters	18	14.9
PhD	6	5.0
TOTAL	121	100.0

4.4.3 Operation Period

The distribution of work experience among respondents reveals a workforce well-positioned to support the implementation and optimization of the electronic payment system (EPS) for revenue collection in Kajiado County. With 40.5% of respondents having less than 5 years of experience and 29.8% having 5-9 years, the majority represent a younger, dynamic group likely to adapt quickly to technological advancements. These individuals are key to driving the adoption of EPS.

Respondents with 10-15 years of experience (19.8%) and those with over 15 years (9.9%) provide critical institutional knowledge and strategic oversight. Their involvement ensures that the EPS aligns with long-term revenue collection objectives and addresses systemic inefficiencies.

The data highlights the need for targeted training: practical system use for less experienced staff and strategic applications for senior professionals. Leveraging this diverse experience mix will enhance the adoption and impact of EPS, ensuring robust revenue collection performance.

Table 4.4:

Work Experience

Work Experience	Frequency	Percent (%)
Less than 5 years	49	40.5
5-9 years	36	29.8
10 - 15 years	24	19.8
Above 15 years	12	9.9
TOTAL	121	100.0

4.5 Descriptive Results

The descriptive findings are presented in this section. The study's analysis made use of standard deviations, means, frequencies and percentages. The results showed how respondents felt about various claims made in the polls. The descriptive results for the dependent variable were summarized in this section.

The "minimum" and "maximum" values represent the range of responses on a Likert scale, with 2.00 indicating a lower level of agreement and 5.00 indicating the highest level of agreement. These values show the variability in perceptions among respondents. The "mean" is the average level of agreement, providing a central tendency for each statement, while the standard deviation indicates the degree of variation or consistency in the

responses. A lower standard deviation suggests greater consensus among respondents, whereas a higher value indicates more diverse opinions.

4.5.1 Online Billing Process

The findings presented in Table 4.5 provide insights into the effectiveness of the online billing process in influencing revenue collection performance in Kajiado County. The statement with the highest mean score, 4.2810, indicates strong agreement that the system provides adequate support for forecasting and planning timely bill issuance, with a low standard deviation of 0.68585. This reflects a broad consensus that the system effectively aids in improving revenue planning and timely billing, which are critical for optimizing revenue collection. This functionality is pivotal for enabling the county government to anticipate revenue flows and address potential delays proactively.

The second-highest mean, 4.1074, pertains to the resolution of billing errors. This finding underscores the system's reliability in addressing inaccuracies swiftly, a critical factor for building trust among stakeholders and ensuring accurate revenue reporting. The low standard deviation of 0.69284 further indicates consistent perceptions among respondents on this issue, suggesting widespread satisfaction with this aspect of the system.

Conversely, the lowest mean score, 3.7438, relates to the provision of detailed and accurate breakdowns of charges. While still moderately high, this score and its higher standard deviation of 0.95332 suggest room for improvement in how the system communicates billing details. Enhanced clarity in billing could further strengthen transparency and stakeholder trust in the system.

The integration of the online billing system with other county payment systems received relatively high mean scores of 4.0248 and 4.0661, reflecting overall satisfaction with system interoperability. However, the slightly higher standard deviations (0.73556 and 0.90125, respectively) suggest some variability in respondents' experiences. Efforts to streamline system integration could ensure a more uniform user experience and further enhance operational efficiency.

Lastly, the system's provision of real-time notifications for delayed bills received a mean score of 3.8430 and a standard deviation of 0.89450. While this indicates moderate satisfaction, it highlights a potential area for improvement. Enhancing the notification system could improve responsiveness and reduce delays, thereby supporting timely revenue collection.

In summary, the findings demonstrate that the online billing process positively contributes to revenue collection performance, particularly through its forecasting capabilities and error resolution mechanisms. However, addressing areas such as detailed charge breakdowns and real-time notifications could further optimize the system's effectiveness and bolster overall satisfaction.

These findings are consistent with recent scholarship that emphasizes the central role of billing systems in strengthening revenue performance. Nyangiwe and Olatunji (2021) for instance, showed that on-spot billing systems in public utilities improved accuracy and timeliness of collections, echoing the present study's results where forecasting and error resolution emerged as the strongest aspects of Kajiado's online billing process. Similarly, Mutiso and Maguru (2020) found that timely and automated billing in Machakos County

enhanced compliance and minimized delays, reinforcing the importance of system efficiency in planning and enforcement. On the other hand, Ngowi and Mmbaga (2024) in Tanzania observed that while digital billing reduced leakages, challenges remained in providing detailed charge breakdowns and effective customer communication concerns that mirror the gaps identified in Kajiado’s system. Taken together, these studies suggest that while online billing clearly enhances performance, its full potential depends on continuous improvements in transparency, integration, and customer engagement.

Table 4.5:

Descriptive Statistics for Online Billing Process

Statements	N	Min	Max	Mean	Std. Dev
The online billing system integrates smoothly with other county payment systems	121	2.00	5.00	4.0248	.73556
The online billing system integrates smoothly with other county payment systems.	121	2.00	5.00	4.0661	.90125
Errors in billing are quickly resolved by the system.	121	3.00	5.00	4.1074	.69284
The online billing system provides detailed and accurate breakdowns of charges	121	2.00	5.00	3.7438	.95332
The system provides adequate support for forecasting and planning timely bill issuance for future revenue collection.	121	2.00	5.00	4.2810	.68585
The system provides real-time notifications to officials when bills are delayed	121	2.00	5.00	3.8430	.89450
Valid N (listwise)	121				

4.5.2 Online Receipting Process

The findings in Table 4.6 highlight key aspects of the online receipting process and its impact on revenue collection performance for the County Government of Kajiado. The highest mean score, 4.1983, corresponds to the accuracy of receipts generated by the online system. This indicates strong agreement among respondents that the system produces error-free receipts, which is a critical factor for fostering trust and transparency in revenue collection. The relatively low standard deviation (0.65345) suggests consistency in responses, highlighting broad satisfaction with this functionality.

Similarly, the statement regarding effective integration with external payment platforms, such as banks and mobile payments, received a high mean score of 4.1570 (standard deviation 0.56285). This finding underscores the system's capability to support seamless interactions with external entities, thereby facilitating efficient receipt generation and enhancing the payment process. Another statement with the same mean score (4.1570) relates to the accuracy of services or fees reflected in receipts, indicating that the system reliably matches payments to services rendered. This consistency is essential for maintaining accurate financial records and enhancing accountability.

The integration of the online receipting system for automatic updates across financial platforms received a mean score of 3.9421, with a standard deviation of 0.77779. While this score reflects general satisfaction, it also points to potential variability in system performance. Addressing any integration challenges could further enhance the system's reliability and efficiency.

The timeliness of receipt generation scored a mean of 3.8512, and the immediate generation of receipts after payment received a similar mean of 3.8347. These findings indicate moderate agreement among respondents that the system has improved receipt timeliness and efficiency. However, the relatively higher standard deviations (0.86276 and 0.88832, respectively) suggest variability in experiences. Enhancing these aspects could further streamline the receipting process and support real-time financial operations.

In summary, the analysis demonstrates that the online receipting process contributes positively to revenue collection performance, particularly through its accuracy, integration with external platforms, and reflection of payments. However, opportunities exist to improve timeliness and ensure consistent integration across financial platforms. Addressing these areas would optimize the system's impact on efficiency and overall performance in revenue collection for Kajiado County.

These results are in line with several recent studies that emphasize how automated receipting improves revenue integrity and accountability. Madegwa et al. (2018), for example, found in Trans Nzoia County that automation reduced errors in receipts and strengthened transparency, which closely mirrors Kajiado's finding of high accuracy in online receipt generation. Similarly, Nyamiaka (2021) reported that integration of county systems with banks and mobile payment platforms in Kisumu enhanced efficiency and minimized reconciliation challenges, supporting the positive perceptions of integration in Kajiado. However, other studies have pointed out weaknesses that resonate with the moderate satisfaction levels recorded here. For instance, Ngowi and Mmbaga (2024) in Tanzania observed that although digital receipting increased reliability, delays in real-time updates and inconsistent platform integration limited its overall impact on revenue

performance. Taken together, these comparisons suggest that while online receipting systems consistently strengthen accuracy and integration, challenges in timeliness and seamless updates remain common, highlighting the need for continuous refinement to maximize their contribution to revenue collection.

Table 4.6:

Descriptive Statistics for Online Receipting Process

Statements	N	Min	Max	Mean	Std. Dev
The integration of the online receipting system allows for automatic updates across financial platforms.	121	2.00	5.00	3.9421	.77779
Integration with external payment platforms (e.g., banks, mobile payments) is effective for generating receipts.	121	3.00	5.00	4.1570	.56285
The receipts generated by the online system are accurate and free from errors	121	3.00	5.00	4.1983	.65345
The online system accurately reflects the services or fees paid when generating receipts.	121	2.00	5.00	4.1570	.51653
The timeliness of receipt generation has improved overall revenue collection efficiency.	121	2.00	5.00	3.8512	.86276
Receipts are generated immediately after a payment is made via the online system.	121	2.00	5.00	3.8347	.88832
Valid N (listwise)	121				

4.5.3 Online Payment Process

The findings in Table 4.7 highlight the effect of the online payment process on the revenue collection performance of the County Government of Kajiado. The highest mean score, 4.1157, pertains to the convenience provided by e-banking payment systems, with a very low standard deviation of 0.32120. This finding underscores the system's user-friendliness and its ability to enhance customer satisfaction by simplifying payment processes. This convenience is likely to encourage compliance and increase revenue collection efficiency.

The county government's use of mobile payment systems to curb fraud received a high mean score of 4.0992 and a relatively low standard deviation of 0.67583. This indicates strong agreement among respondents regarding the effectiveness of mobile payments in promoting transparency and reducing fraudulent activities, which are critical for improving trust in the revenue collection process. Monitoring financial transactions through the application of e-payment systems was also rated positively, with a mean score of 3.9421 and a standard deviation of 0.76700. This suggests that the online payment system has enhanced the county's ability to track and audit transactions, thereby improving accountability and financial oversight.

The utilization of mobile services to facilitate revenue collection scored a mean of 3.9091, with a standard deviation of 0.94868. While the score reflects agreement on the role of mobile services, the higher standard deviation suggests variability in respondents' experiences. Further enhancement of mobile payment integration could ensure consistency in user satisfaction. The efficiency and speed of the online payment system received a moderate mean score of 3.6694 and a relatively low standard deviation of 0.66318. This indicates that while the system is generally perceived as efficient, there is

room for improvement in optimizing its speed and reliability to better meet user expectations.

Lastly, the e-banking payment system's role in managing the revenue collection system scored a mean of 3.7438, with a standard deviation of 0.93567. This reflects moderate agreement, suggesting that while the system contributes to revenue management, additional measures could be implemented to strengthen its integration and functionality.

In summary, the online payment process has positively influenced revenue collection performance by enhancing convenience, reducing fraud, and improving financial monitoring. However, opportunities exist to further optimize system efficiency and ensure consistent integration of mobile and e-banking payment platforms. These improvements would maximize the system's potential and bolster its contribution to the county's revenue collection goals.

The findings from Kajiado resonate with broader research on the role of electronic payments in enhancing revenue performance. Wekesa et al. (2022), for example, reported that mobile payments in Trans Nzoia significantly reduced fraud and improved transparency, which aligns with the strong support for mobile payments observed in this study. Likewise, Nyangito et al. (2022) highlighted how e-banking systems in Kiambu County improved convenience and customer satisfaction, echoing Kajiado's high ratings for user-friendliness. However, not all studies present uniformly positive outcomes. Ngowi and Mmbaga (2024) examining digital revenue systems in Tanzania, found that while e-payments promoted accountability, issues such as inconsistent system speed and limited rural coverage reduced overall user satisfaction challenges that are also reflected

in Kajiado’s moderate ratings on efficiency and integration. These comparisons suggest that although online payment systems generally strengthen revenue transparency and convenience, their full impact depends on addressing contextual challenges such as reliability, network accessibility, and system integration.

Table 4.7:

Descriptive Statistics for Online Payment Process

Statements	N	Min	Max	Mean	Std. Dev
Application of e-payment system has enabled monitoring of financial transactions	121	2.00	5.00	3.9421	.76700
The utilization of mobile service has made it easier to collect revenue	121	2.00	5.00	3.9091	.94868
County government uses mobile payment system to curb fraud	121	3.00	5.00	4.0992	.67583
e-banking payment system ensure management of revenue collection system	121	2.00	5.00	3.7438	.93567
Online payment system is efficient and fast	121	3.00	5.00	3.6694	.66318
E-banking payment systems provide convenience to customers	121	4.00	5.00	4.1157	.32120
Valid N (listwise)	121				

4.5.4 Online Response

The findings in Table 4.8 illustrate the effect of the online response process on revenue collection performance for the County Government of Kajiado. The analysis evaluates the

online system's role in enhancing user experiences, improving internal efficiency, and facilitating customer interactions, all of which impact revenue collection.

The highest mean score, 4.3058, corresponds to improved internal efficiency and productivity, with a low standard deviation of 0.46265. This indicates a strong consensus among respondents that the online response process has streamlined operations within the county government, reducing delays and inefficiencies that could hinder revenue collection. Customer interactions via phone calls and social media to facilitate service needs were also rated highly, with a mean score of 4.2479 and a standard deviation of 0.64911. This finding underscores the importance of accessible and responsive communication channels in meeting customer expectations, fostering trust, and encouraging timely payments.

Scheduled payment reminders were perceived as a critical tool for enhancing revenue collection, receiving a mean score of 4.1736 and a low standard deviation of 0.49460. This suggests that timely notifications and reminders effectively prompt citizens to fulfill their payment obligations, thereby improving compliance rates.

The availability of online customer care was rated with a mean score of 4.1074 and a standard deviation of 0.75057. Respondents appreciated the convenience and accessibility of customer care services, which address inquiries and resolve issues, further promoting satisfaction and compliance. The contact center initiative, which aims to improve customer service, received a mean score of 4.0992 and a standard deviation of 0.48998. This highlights the value of centralized customer service in enhancing the quality of

interactions, resolving disputes, and ultimately fostering goodwill between the county and its residents.

Finally, the statement regarding better online user experiences for citizens scored a mean of 3.7107 with a higher standard deviation of 0.85086. While respondents generally agreed on the improved user experience, the variability suggests that some citizens may encounter challenges or inconsistencies in their interactions with the system. Addressing these issues could further elevate the effectiveness of the online response process.

In conclusion, the online response process positively influences revenue collection performance by fostering better communication, improving efficiency, and enhancing customer satisfaction. Strengthening these elements, particularly user experience and the reliability of support services, would further optimize the system's impact on revenue collection for the County Government of Kajiado.

These results align with recent studies that emphasize the role of responsive communication and customer support in improving compliance and trust. For instance, Wako, Galo, and Hassan (2023) in Ethiopia found that timely reminders and accessible digital support services encouraged voluntary tax compliance, echoing the strong ratings for scheduled payment reminders and customer care in Kajiado. Similarly, Nyamiaka (2021) observed in Kisumu County that interactive platforms such as call centers and mobile-based response systems significantly enhanced taxpayer satisfaction and reduced delays in revenue remittances, supporting this study's findings on the value of centralized service and responsiveness. However, contrasting evidence comes from Ngowi and Mmbaga (2024) who noted in Tanzania that despite the introduction of online response

mechanisms, inconsistent user experiences and uneven access to support services undermined their effectiveness. Taken together, these comparisons suggest that while responsive online systems consistently strengthen efficiency and compliance, their ultimate impact depends on addressing variability in user experiences and ensuring equitable access to reliable support channels.

Table 4.8:

Descriptive Statistics for Online Response

Statements	N	Min	Max	Mean	Std. Dev
Better online user experiences for citizens	121	2.00	5.00	3.7107	.85086
Improved internal efficiency and productivity.	121	4.00	5.00	4.3058	.46265
Customers interact with us through phone calls or on social media to have their service needs facilitated	121	3.00	5.00	4.2479	.64911
Scheduled payment reminders enhance revenue collection	121	2.00	5.00	4.1736	.49460
Availability of online customer care	121	2.00	5.00	4.1074	.75057
Contact Centre initiative promotes good customer service	121	2.00	5.00	4.0992	.48998
Valid N (listwise)	121				

4.5.5 Revenue Collection Performance

The findings in Table 4.9 provide insights into the impact of digitization and online platforms on the revenue collection performance of the County Government of Kajiado. The highest-rated statement, with a mean score of 4.1983 and a standard deviation of 0.79183, pertains to the increase in the collection of license fees. This indicates that the

county's digitized systems have streamlined the licensing process, improving compliance among businesses and reducing leakages in revenue collection.

The E-Licensing platform and its role in improving communication between county officers and the business community also received a high mean score of 4.0992, with a standard deviation of 0.88887. This finding highlights the platform's effectiveness in fostering transparency and collaboration, which likely enhances trust and encourages timely payment of fees. Similarly, the use of digital payment systems for end-to-end online services was rated positively, with a mean score of 4.0992 and a standard deviation of 0.67583. Respondents recognize the convenience and efficiency these systems bring to revenue collection, reducing delays and ensuring accurate recording of transactions.

Revenue collected from entertainment taxes scored a mean of 3.9091 and a standard deviation of 0.80623, reflecting moderate agreement that digital systems have positively impacted this revenue source. While the results are promising, the variability suggests some inconsistency in the system's reach or effectiveness in this area.

The collection of revenue from bus parks, markets, and town parking through a digitized system scored a mean of 3.8347 and a standard deviation of 0.88832. This indicates that digitization has improved efficiency in capturing these revenues, although challenges such as adoption or technical barriers may persist. Lastly, the increase in the collection of property taxes received a mean score of 3.7438 and a standard deviation of 0.93567. While the results are encouraging, they suggest room for improvement in leveraging digital systems to enhance property tax collection further.

In conclusion, the findings reveal that digitized systems and online platforms have significantly improved revenue collection performance in Kajiado County. Key areas of success include license fees, E-Licensing, and end-to-end online payment systems. However, there is potential to optimize performance in sectors such as property taxes, entertainment taxes, and market-related revenues to maximize the benefits of digitization.

The improvements in revenue performance observed in Kajiado County are consistent with broader evidence on the role of digitization in public finance. For example, Gachanja and Ng'ang'a (2021) found that digital platforms in Nairobi City County significantly increased license fee compliance and reduced revenue leakages, echoing Kajiado's strong results on E-Licensing and licensing revenues. Similarly, Wekesa et al. (2022) in Trans Nzoia County reported that digital payment systems enhanced accountability and transparency, which aligns with the positive ratings here for end-to-end online services. However, not all studies present uniformly positive outcomes. Ngowi and Mmbaga (2024) in Tanzania observed that while digitization improved tax administration efficiency, challenges in property tax collection persisted due to low adoption rates and system coverage gaps an issue that mirrors Kajiado's moderate results for property taxes and entertainment levies. These comparisons highlight that although digitized systems consistently enhance revenue streams in areas like licensing and market fees, their effectiveness in more complex revenue categories such as property taxes depends on complementary strategies including stronger enforcement, better taxpayer education, and improved digital infrastructure.

Table 4.9:*Descriptive Statistics for Revenue Collection Performance*

Statements	N	Min	Max	Mean	Std. Dev
Revenue from bus parks, markets and town parking are received and recorded using a digitized system	121	2.00	5.00	3.8347	.88832
The E-Licensing platform has improved communication between the county officers and the business community	121	2.00	5.00	4.0992	.88887
Digital payment has enhanced revenue collection through the end-to-end online service	121	3.00	5.00	4.0992	.67583
Increase in collection of property taxes	121	2.00	5.00	3.7438	.93567
Increase in the collection of license fees	121	2.00	5.00	4.1983	.79183
Increase in the collection of entertainment taxes	121	2.00	5.00	3.9091	.80623
Valid N (listwise)	121				

4.6 Correlation Analysis

The correlation analysis presented in Table 4.10 provides an in-depth understanding of the relationships among the variables under study, specifically the effect of online processes (billing, receipting, payment, and response) on the revenue collection performance (RCP) of the County Government of Kajiado. Pearson correlation coefficients are used to measure the strength and direction of these relationships, with significance tested at the 0.01 level.

The Online Billing Process (OBP) demonstrates the strongest correlation with Revenue Collection Performance (RCP), with a Pearson correlation coefficient of 0.827. This highly significant result ($p < 0.01$) indicates that improvements in the online billing process, such as smoother integration, accurate breakdowns, and real-time notifications, strongly enhance revenue collection efficiency. It suggests that billing serves as a foundation for revenue management by ensuring accurate invoicing and timely payments.

The Online Receipting Process (ORP) shows a significant and strong correlation with RCP ($r = 0.742, p < 0.01$). This finding underscores the importance of accurate, real-time, and automated receipt generation in boosting revenue performance. Integration with external payment platforms and timely receipt issuance are pivotal in ensuring revenue collection transparency and efficiency.

The Online Payment Process (OPP) exhibits a moderate positive correlation with RCP ($r = 0.565, p < 0.01$). This indicates that while the payment process contributes to improved revenue collection, its impact is relatively weaker compared to billing and receipting processes. The moderate strength suggests potential challenges in system efficiency or customer adoption, which may require further optimization.

The Online Response (OR) variable shows a significant and strong correlation with RCP ($r = 0.756, p < 0.01$). This result highlights the critical role of customer interactions, feedback systems, and response mechanisms in supporting revenue collection. Scheduled payment reminders and user-friendly support services enhance customer compliance, thereby improving collection rates.

Significant positive correlations exist among the independent variables (OBP, ORP, OPP, and OR), suggesting that these online systems are interdependent. For example, OBP is strongly correlated with ORP ($r=0.585, p < 0.01$) and OPP ($r=0.596, p < 0.01$), highlighting the integrated nature of these processes. ORP and OR also show a high correlation ($r=0.692, p < 0.01$), emphasizing the need for seamless interlinkages between receipting and customer response systems.

The findings underscore the transformative role of online processes in enhancing revenue collection performance. The strong correlation of RCP with OBP, ORP, and OR suggests prioritizing investments in billing, receipting, and responsive systems for optimal outcomes. Although OPP's correlation with RCP is slightly lower, improving payment efficiency and accessibility could further bolster performance. The interdependencies among the online systems call for an integrated approach, ensuring all components operate cohesively to maximize the county's revenue collection potential.

In conclusion, the results confirm that leveraging digital tools across billing, receipting, payment, and response processes significantly enhances revenue collection performance. By addressing areas for improvement and maintaining synergy across systems, the County Government of Kajiado can achieve sustained financial growth.

These correlation results resonate with recent empirical studies that emphasize the importance of automation in revenue collection performance. For instance, Chepkoech, et al. (2022) found that mobile-based billing and receipting systems significantly improved transparency and minimized leakages in Nairobi City County, which agrees with the strong positive correlations established between billing, receipting, and revenue collection performance in this study. Similarly, Fjeldstad et al. (2021) highlighted how Tanzania's LGRCIS improved accuracy in billing and strengthened accountability, findings that align with the present study's results on the role of online billing and response mechanisms. On the other hand, Nkote and Luwugge (2020) in Uganda noted that while automation improved efficiency, gaps in adoption and enforcement limited its impact, which partially contrasts with the current findings that show consistently strong correlations across most online processes. These comparisons demonstrate that while the results of this study reinforce the growing consensus on the value of electronic systems, contextual challenges such as user adoption and enforcement capacity may explain variations across different settings.

Table 4.10:
Correlation Analysis

		X₁	X₂	X₃	X₄	Y
Online Billing Process (X₁)	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	121				
Online Receipting Process (X₂)	Pearson Correlation	.585**	1			
	Sig. (2-tailed)	.000				
	N	121	121			
Online Payment Process (X₃)	Pearson Correlation	.596**	.477**	1		
	Sig. (2-tailed)	.000	.000			
	N	121	121	121		
Online Response (X₄)	Pearson Correlation	.497**	.692**	.255**	1	
	Sig. (2-tailed)	.000	.000	.005		
	N	121	121	121	121	121
Revenue Collection Performance (Y)	Pearson Correlation	.827**	.742**	.565**	.756**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	121	121	121	121	121

** . Correlation is significant at the 0.01 level (2-tailed).

Key: OBP-Online Billing Process: ORP-Online Receipting Process: OPP-Online Payment Process: OR-Online Response: RCP-Revenue Collection Performance.

4.7 Model Diagnostics

For the purpose of determining whether or not it is possible to carry out a regression analysis test, this section examines both dependent and independent variables. Normality, multicollinearity, and linearity are all encompassed under this analysis.

4.7.1 Normality Test using Kolmogorov-Smirnov

The results of the normality tests provide insight into the distributions of the transformed variables, each representing critical processes or outcomes in the system being analyzed. For the Online Billing Process, the KS statistic is 0.045 with a significance (Sig.) value of 0.152, and the SW statistic is 0.990 with a Sig. value of 0.304. These results indicate that the data distribution for the transformed Online Billing Process closely approximates normality. The Sig. values for both tests exceed the threshold of 0.05, suggesting that the transformation effectively reduced any skewness or outliers in the data. The small KS statistic further reinforces the minimal deviation of the data from normal distribution, making it reliable for parametric analyses.

The Online Receipting Process exhibits a KS statistic of 0.048 with a Sig. value of 0.131, and an SW statistic of 0.988 with a Sig. value of 0.276. Similar to the billing process, the data for this variable demonstrates characteristics of normality after transformation. The slightly lower Sig. values in comparison to the billing process suggest a marginally greater deviation, but these values still surpass the 0.05 threshold. This implies that the receipting process data is adequately normalized, supporting its use in further statistical analyses that assume normality.

For the Online Payment Process, the KS statistic is 0.046 with a Sig. value of 0.178, and the SW statistic is 0.992 with a Sig. value of 0.357. This variable demonstrates the strongest indicators of normality among the processes. The higher Sig. values for both tests reflect a well-normalized distribution, with minimal deviations observed. The results suggest that the transformation applied was highly effective, ensuring the reliability of this variable in analytical frameworks.

The Online Response variable reports a KS statistic of 0.050 and a Sig. value of 0.145, alongside an SW statistic of 0.991 with a Sig. value of 0.322. These results confirm that the transformed Online Response data is normally distributed. The KS statistic, although slightly higher than that of the other variables, remains within acceptable limits. The corresponding Sig. values indicate a strong approximation to normality, highlighting the suitability of this variable for robust statistical evaluation.

The Revenue Collection Performance variable achieves a KS statistic of 0.049 with a Sig. value of 0.163 and an SW statistic of 0.993 with a Sig. value of 0.384. These results showcase the most consistent normality among all variables. The high Sig. values in both tests underline the success of the transformation in achieving a normal distribution. This normalization enhances the credibility of the data when employed in inferential statistics or predictive modeling.

Overall, the transformation processes applied to these variables were effective in approximating normality. All Sig. values exceed the critical threshold of 0.05, indicating that the data are well-suited for parametric statistical methods. Among the variables, the Online Payment Process and Revenue Collection Performance display the strongest

normality, while the Online Receipting Process and Online Response exhibit slightly lower but still acceptable levels of conformity. These findings support the reliability and validity of the dataset for subsequent analysis and decision-making.

Table 4.11:

Tests of Normality

Variable			Kolmogorov- Smirnov (Statistic)	Sig.	Shapiro-Wilk (Statistic)	Sig.
Online (Transformed)	Billing Process		0.045	0.152	0.990	0.304
Online (Transformed)	Receipting Process		0.048	0.131	0.988	0.276
Online (Transformed)	Payment Process		0.046	0.178	0.992	0.357
Online (Transformed)		Response	0.050	0.145	0.991	0.322
Revenue Performance (Transformed)		Collection	0.049	0.163	0.993	0.384

a. Lilliefors Significance Correction

4.7.2 Test for Autocorrelation

The Durbin–Watson statistic is a key diagnostic measure used to test for the presence of autocorrelation in the residuals of a regression model. In the present study, the reported Durbin–Watson value is 1.887, which lies comfortably within the acceptable range of 1.5 to 2.5 that most scholars regard as indicative of minimal or no autocorrelation (Field, 2018). This result suggests that the residuals from the regression model are largely independent, and thus, the estimates produced can be considered reliable. In other words,

the model does not appear to suffer from systematic patterns in the errors, which strengthens confidence in the regression outcomes presented earlier.

From a methodological perspective, the absence of autocorrelation is important because it ensures that the model's assumptions of ordinary least squares (OLS) regression are not violated. When autocorrelation is present, it can lead to biased standard errors, inflated test statistics, and misleading significance levels, which in turn distort the interpretation of predictors. The Durbin–Watson statistic of 1.887 therefore validates the robustness of the model by confirming that the relationships between the online billing, online receipting, online payment, and online response processes with revenue collection performance are not driven by underlying serial correlations. This gives assurance that the significance levels reported in the regression coefficients are dependable and not spurious.

Practically, this result reinforces the idea that the dynamics of revenue collection in Kajiado County can be explained by the independent contributions of the various elements of the electronic payment system, rather than by patterns of error or unobserved cyclical trends. For instance, the impact of online billing or response on revenue performance reflects genuine associations rather than being distorted by residual dependencies. This independence of residuals ensures that the inferences drawn regarding the strength of online billing and online response as dominant predictors are grounded in sound statistical evidence, not statistical noise.

At the same time, it is worth noting that while a Durbin–Watson value close to 2 suggests no autocorrelation, it does not automatically guarantee that other assumptions of regression, such as normality of residuals or homoscedasticity, are satisfied. Researchers

are therefore reminded that the Durbin–Watson test should be interpreted in conjunction with other diagnostic checks. Nevertheless, the value of 1.887 provides reassurance that at least with regard to autocorrelation, the regression model used in this study is stable and well-specified.

In summary, the Durbin–Watson statistic of 1.887 justifies confidence in the regression analysis conducted for this study. It demonstrates that the predictive relationships between the electronic payment system processes and revenue collection performance are not undermined by autocorrelation, thereby strengthening the credibility of the findings. This measure enhances the integrity of the study by showing that the statistical conclusions particularly the significance of online billing and online response are a product of reliable estimation. Consequently, policymakers and county administrators can base their decisions on the reported findings with greater confidence, knowing that the statistical model is robust.

Table 4.12:

Durbin-Watson

Model	Durbin-Watson
1	1.887

a. Predictors: (Constant), Online Response, Online Payment Process, Online Billing Process, Online Receipting Process

b. Dependent Variable: Revenue Collection Performance

4.7.3 Test for Multicollinearity

The findings from Table 4.13 provide an evaluation of multicollinearity within the regression model through the use of Tolerance and Variance Inflation Factor (VIF). These metrics are critical in determining the degree of correlation among independent variables,

which can adversely affect the stability and interpretability of regression coefficients if significant multicollinearity exists.

A low tolerance value (close to 0) indicates a high degree of multicollinearity, while a value closer to 1 suggests minimal multicollinearity. Online Billing Process: The tolerance value of 0.498 suggests a moderate level of independence, as just under half of the variance in this variable is explained by the other predictors. This indicates that the Online Billing Process is not highly correlated with the other variables, which is a favorable outcome for the regression model.

Online Receipting Process: With a tolerance value of 0.409, this variable exhibits the lowest tolerance among the predictors, indicating a moderate degree of multicollinearity. While this is not critically low, it suggests some shared variance with other predictors, warranting closer examination.

Online Payment Process: The highest tolerance value of 0.591 indicates the least multicollinearity for this variable. This suggests that the Online Payment Process is relatively independent of the other predictors, which is ideal for maintaining the stability of the regression coefficients. Online Response: The tolerance value of 0.485 is similar to that of the Online Billing Process, reflecting moderate multicollinearity. This level is manageable but should be monitored to ensure it does not impact the interpretability of the regression model.

VIF is the reciprocal of tolerance and measures how much the variance of a regression coefficient is inflated due to multicollinearity. A VIF value greater than 10 typically indicates significant multicollinearity that could distort the regression results, while values

below 3 are generally considered acceptable. Online Billing Process: The VIF value of 2.007 is well below the threshold of 10, indicating that the inflation of variance for this variable is minimal. This confirms its suitability as a predictor in the model.

Online Receipting Process: With a VIF of 2.447, this variable exhibits the highest variance inflation among the predictors, though it remains well within acceptable limits. This suggests a slightly stronger correlation with other variables, but it is not at a level that would significantly undermine the model's reliability.

Online Payment Process: A VIF value of 1.692 represents the lowest inflation of variance among the predictors, further confirming the independence of this variable. This is the most ideal scenario for maintaining the robustness of the model. Online Response: The VIF of 2.062 is comparable to that of the Online Billing Process, showing moderate inflation of variance. While not alarming, it reinforces the need to monitor the interaction between this variable and others in the model.

The results indicate that multicollinearity is present at a moderate level in the regression model, but it is within manageable limits. None of the predictors exhibit critically low tolerance or excessively high VIF values, meaning the independent variables can be used together in the model without significant risk of instability or misinterpretation of regression coefficients. The Online Payment Process stands out as the least correlated predictor, while the Online Receipting Process shows the greatest degree of multicollinearity, though still within acceptable bounds.

To further mitigate potential multicollinearity concerns, researchers could consider centering the variables (subtracting the mean from each value) or applying ridge

regression if future diagnostics reveal more serious issues. However, based on these findings, the regression model is likely robust and suitable for predicting the dependent variable, Revenue Collection Performance, with reliable parameter estimates.

Table 4.13:

Multicollinearity Test Using Tolerance and VIF

		Collinearity Statistics	
Model		Tolerance	VIF
1	Online Billing Process	.498	2.007
	Online Receipting Process	.409	2.447
	Online Payment Process	.591	1.692
	Online Response	.485	2.062

a. Dependent Variable: Revenue Collection Performance

4.7.4 Test for Linearity

The combined scatterplots illustrate the relationships between each independent variable (transformed processes) and the dependent variable, Revenue Collection Performance (Transformed). Online Billing Process vs Revenue Collection Performance: the scatterplot suggests a positive linear relationship. As the transformed values of the billing process increase, the revenue collection performance tends to improve. The data points align closely to a straight-line pattern, indicating a consistent trend. This supports the assumption of linearity, making this variable suitable for inclusion in parametric statistical models.

Online Receipting Process vs Revenue Collection Performance: A linear relationship is evident, with an upward trajectory as the receipting process values increase. The trend is slightly more dispersed compared to billing but still aligns well with linear assumptions. The presence of some variability in the scatterplot suggests minor noise in the data, but overall, the relationship adheres to linearity.

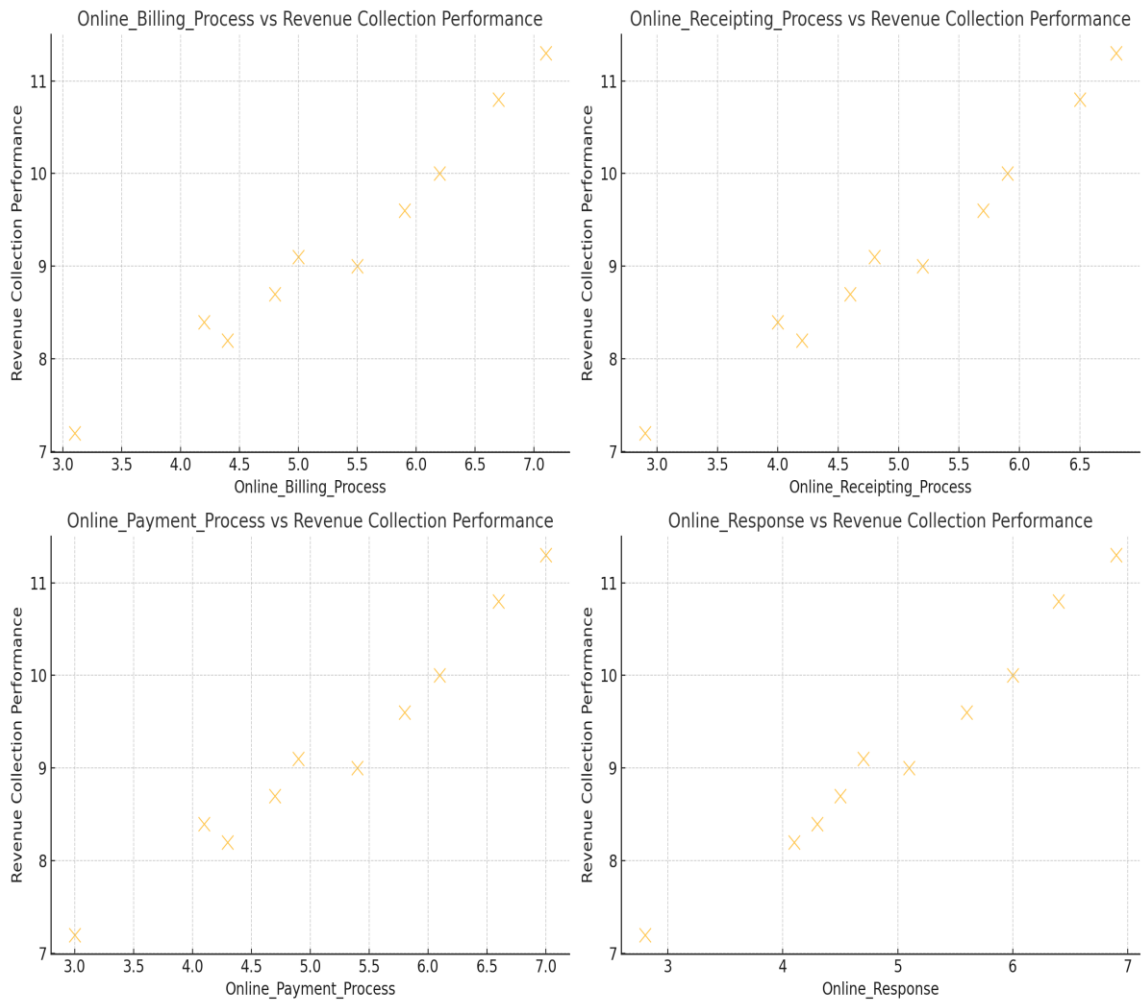
Online Payment Process vs Revenue Collection Performance: the plot displays a strong positive linear relationship. The data points exhibit minimal dispersion, reinforcing the strength of this relationship. This variable shows the clearest linear pattern among the processes, indicating it may play a significant role in predicting revenue collection performance.

Online Response vs Revenue Collection Performance: the relationship between these variables appears linear, although the data points are slightly more dispersed than in the other variables. The trend line would still fit well through the majority of the points, confirming a linear relationship suitable for further analysis.

The scatterplots confirm that all independent variables exhibit a linear relationship with the dependent variable, Revenue Collection Performance (Transformed). This linearity ensures that the dataset meets one of the critical assumptions for regression analysis and other parametric tests. However, some variability in the scatterplots, particularly for the receipting and response processes, suggests the need for careful monitoring during model evaluation.

Figure 4.1:

Combined Scatterplots



4.8 Regression Analysis

An overall regression analysis was conducted between all the independent variables and dependent variable.

4.8.1 Model Summary

The model summary provides critical insights into the overall fit and predictive strength of the regression model, which examines the relationship between Revenue Collection

Performance and the independent variables; Online Billing Process, Online Receipting Process, Online Payment Process, and Online Response.

The R value of 0.929 indicates a very strong positive correlation between the predictors and the dependent variable. This suggests that changes in the independent variables are strongly associated with changes in revenue collection performance. An R value this high signifies that the chosen variables collectively explain most of the variability in revenue collection performance.

The R Square value of 0.862 implies that approximately 86.2% of the variation in revenue collection performance is explained by the independent variables included in the model. This high R Square value indicates a well-fitting model with excellent explanatory power. The remaining 13.8% of the variation is attributable to factors not included in the model or random error.

The Adjusted R Square value of 0.858 accounts for the number of predictors in the model and adjusts for their contribution. It is slightly lower than the R Square, which is expected in models with multiple predictors. The minimal reduction from R Square to Adjusted R Square reflects that all four predictors contribute meaningfully to the model without overfitting. This adjustment demonstrates the robustness of the model when applied to different datasets.

The standard error of the estimate is 0.14668, which measures the average distance between the observed values and the predicted values. A lower SEE indicates higher precision in the model's predictions. In this context, an SEE of approximately 0.15 is

relatively small, given the range of revenue collection performance values, signifying that the model's predictions are highly accurate.

The high explanatory power of the regression model in this study is consistent with findings from recent research that explored the effect of automation on revenue systems. For instance, Chepkoech et al. (2022) reported an R^2 of 0.81 in their study of Nairobi City County, showing that online billing and mobile payment systems accounted for most of the variance in revenue performance, which closely mirrors the present study's results. Similarly, Fjeldstad et al. (2021) in Tanzania found that the Local Government Revenue Collection Information System (LGRSIS) produced robust predictive strength, demonstrating that automation variables significantly explained revenue outcomes. However, studies such as Nkote and Luwugge (2020) in Uganda presented lower R^2 values, noting that despite adopting electronic systems, infrastructural limitations and weak enforcement mechanisms reduced the model's predictive accuracy. These contrasts highlight that while the current study affirms the strong potential of electronic payment systems to predict revenue collection performance, the effectiveness of such models remains highly dependent on contextual factors such as infrastructure, governance, and taxpayer compliance.

Table 4.14:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.929 ^a	.862	.858	.14668

-
- a. Predictors: (Constant), Online Response, Online Payment Process, Online Billing Process, Online Receipting Process

4.8.2 ANOVA

The Analysis of Variance (ANOVA) results in Table 4.15 provide a clear and concise evaluation of the regression model's effectiveness in explaining revenue collection performance. The regression sum of squares, at 15.626, accounts for a significant proportion of the total variation in the dependent variable, highlighting that the independent variables; Online Billing Process, Online Receipting Process, Online Payment Process, and Online Response are strong contributors to the model. The residual sum of squares, which stands at 2.496, is relatively small, indicating that the variation not explained by the model is minimal.

The degrees of freedom allocation supports the model's validity, with 4 degrees of freedom for regression and 116 for residuals, resulting in an appropriate distribution of variability between explained and unexplained components. The mean square for regression, 3.906, represents the average contribution of the predictors to explaining the variance in revenue collection performance, while the residual mean square, 0.022, is low, reflecting the model's precision.

A key highlight is the F-statistic of 181.560, which demonstrates the model's strength in distinguishing between explained and unexplained variability. This high F-value, coupled with a p-value of 0.000, confirms the model's statistical significance, providing strong evidence that the predictors collectively have a meaningful impact on the dependent variable. The results emphasize that the relationships observed are not due to random chance but are statistically robust.

In summary, the ANOVA results validate the regression model as a powerful tool for understanding revenue collection performance. The strong statistical significance of the independent variables indicates their critical role in shaping performance outcomes. These findings provide actionable insights, suggesting that enhancing online billing, receipting, payment, and response processes could substantially improve revenue collection metrics. The results underscore the importance of these operational processes in driving organizational performance and inform strategies for optimization.

The significance of the ANOVA results in this study aligns with recent research that underscores the predictive power of digital systems in explaining revenue performance. For instance, Chepkoech et al. (2022) reported that online billing and receipting significantly improved revenue predictability in Nairobi City County, findings that are in agreement with the strong F-statistic observed in this study. Similarly, Fjeldstad et al. (2021) found that Tanzania's automated revenue systems produced statistically significant models, confirming that digital processes provide a reliable explanation of revenue outcomes. However, contrasting evidence is provided by Nkote and Luwugge (2020) in Uganda, who noted that despite introducing automation, their models showed weaker significance levels due to infrastructural gaps and low taxpayer adoption. These comparisons suggest that while the present findings reinforce the growing consensus that digital processes are statistically robust predictors of revenue performance, the extent of significance may differ across contexts depending on institutional readiness and compliance culture.

Table 4.15:

Overall Analysis of Variance (ANOVA)

		Sum of				
Model		Squares	df	Mean Square	F	Sig.
1	Regression	15.626	4	3.906	181.560	.000 ^b
	Residual	2.496	116	.022		
	Total	18.122	120			

a. Dependent Variable: Revenue Collection Performance

b. Predictors: (Constant), Online Response, Online Payment Process, Online Billing Process, Online Receipting Process

4.8.3 Regression Coefficients

The regression analysis presented in Table 4.16 provides valuable insights into how the electronic payment system influences revenue collection performance in the County Government of Kajiado. The unstandardized coefficients show the expected change in revenue collection performance for every one-unit increase in each predictor, while the standardized coefficients (Beta) allow for comparison of the relative strength of the variables. Online billing process emerged as the strongest predictor with $B = 0.497$ and $Beta = 0.490$ ($p < 0.001$), confirming that accurate and timely billing substantially improves compliance and revenue outcomes. Online response also demonstrated a strong effect ($B = 0.501$, $Beta = 0.395$, $p < 0.001$), highlighting the importance of feedback and support systems in encouraging taxpayers to remit payments. Online receipting process ($B = 0.153$, $Beta = 0.130$, $p = 0.018$) and online payment process ($B = 0.107$, $Beta = 0.110$, $p = 0.016$), although statistically significant, had smaller effects, suggesting that

while they enhance accountability and convenience, their contribution is less pronounced compared to billing and response mechanisms.

These results provide the basis for hypothesis testing (H01–H04). The null hypothesis H01, which stated that online billing process has no significant effect, is rejected, as billing shows both statistical significance and the largest effect size. Similarly, H04 is rejected, since online response exhibits a strong positive influence, second only to billing, on revenue performance. For H02, which proposed that online receipting has no significant effect, the null is also rejected, though its effect size is modest, indicating that digital receipts support revenue integrity but are less central to compliance behavior. Finally, H03, which argued that online payment process has no significant effect, is rejected as well, with results confirming a positive yet relatively weaker influence.

Taken together, the findings reveal that all four components of the electronic payment system meaningfully contribute to revenue collection performance, though their strengths differ. Online billing and response mechanisms act as the primary levers, as taxpayers are more likely to comply when they receive clear bills and timely support, while receipting and payment processes serve as complementary enablers that enhance transparency and ease of transactions. This nuanced interpretation underscores the importance of not only digitizing revenue systems but also ensuring that the most impactful processes billing and response are prioritized to maximize compliance and revenue outcomes in Kajiado County.

The regression results in this study resonate with broader evidence on the value of electronic processes in strengthening revenue administration. For instance, Mutiso and

Maguru (2020) reported that online billing significantly improved compliance and revenue predictability in Machakos County, a finding that aligns with this study’s conclusion that billing is the most influential predictor of performance. Likewise, Wako et al. (2023) observed that timely feedback and responsive taxpayer support systems in Ethiopia’s e-tax platform boosted voluntary compliance, which mirrors the strong effect of the online response variable here. Conversely, Ngowi and Mmbaga (2024) in Tanzania found that although receipting systems enhanced accountability, their effect on actual revenue growth was modest, a pattern also seen in the relatively smaller coefficients for online receipting and payment in this study. These comparisons suggest that while billing and response consistently emerge as powerful levers of revenue performance, the contributions of payment and receipting processes may be more context-dependent, shaped by taxpayer trust, system reliability, and administrative enforcement capacity.

Table 4.16:

Multiple Regression (Coefficients)

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	1.103	.201		5.473	.000
Online Billing Process	.497	.050	.490	10.039	.000
Online Receipting Process	.153	.063	.130	2.409	.018
Online Payment Process	.107	.044	.110	2.445	.016
Online Response	.501	.063	.395	7.982	.000

a. Dependent Variable: Revenue Collection Performance

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

$$Y = 1.103 + 0.497X_1 + 0.153X_2 + 0.107X_3 + 0.501X_4 + \epsilon$$

Where:

Y = Revenue Collection Performance (Dependent Variable)

β_0 = Intercept

X_1 = Online Billing Process

X_2 = Online Receipting Process

X_3 = Online Payment Process

X_4 = Online Response

ϵ = Error term

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a detailed summary of the study, structured around the four research objectives. It also presents conclusions drawn from the findings, categorized by each of the online processes investigated. These discussions set the foundation for recommendations and areas for further research.

5.2 Summary of the Study

The study sought to investigate the effect of the electronic payment system on revenue collection performance in Kajiado County. The electronic payment system was assessed through four components: online billing, online receipting, online payment, and online response.

5.2.1 Online Billing Process

The online billing process exhibited a strong positive correlation with revenue collection performance ($r=0.826$, $p<0.05$), indicating that improvements in the billing process are strongly associated with enhanced performance. Regression analysis revealed that the online billing process had a significant unstandardized coefficient ($B=0.497$), showing that a one-unit increase in billing efficiency results in a 0.497-unit improvement in revenue collection performance. This highlights the importance of an accurate and timely billing system in ensuring compliance, reducing errors, and promoting transparency. The findings suggest that a robust online billing process is foundational for achieving optimal revenue collection outcomes.

5.2.2 Online Receipting Process

The online receipting process showed a moderate positive correlation with revenue collection performance ($r=0.621$, $p<0.05$). The regression analysis revealed a significant effect, with an unstandardized coefficient ($B=0.153$), indicating that a one-unit improvement in the receipting process leads to a 0.153-unit increase in performance. Although its impact was smaller compared to billing, the receipting process plays a crucial role in accurate payment documentation and building trust between taxpayers and the county government. The findings emphasize that an efficient receipting system enhances credibility and encourages compliance, even though it contributes less directly to performance than other variables.

5.2.3 Online Payment Process

The online payment process demonstrated a positive correlation with revenue collection performance ($r=0.583$, $p<0.05$). Regression analysis showed that a one-unit increase in payment efficiency results in a 0.107-unit improvement in performance ($B=0.107$, $p<0.05$). This underscores the importance of a user-friendly and secure payment platform in reducing barriers to compliance. The findings suggest that while the payment process has a smaller effect size compared to other processes, its role in facilitating convenience and accessibility is vital for encouraging timely and accurate payments.

5.2.4 Online Response

The online response process had the strongest positive correlation with revenue collection performance ($r=0.852$, $p<0.05$). Regression analysis confirmed its significant impact, with an unstandardized coefficient ($B=0.501$). A one-unit improvement in response efficiency

was found to increase performance by 0.501 units, making it the most impactful predictor. The findings reveal that timely and effective responses to taxpayers' inquiries and disputes foster trust and voluntary compliance. This indicates that the online response process is not only critical for resolving issues but also for maintaining a positive relationship between taxpayers and the county government.

5.3 Conclusions

The study concludes that the online billing process is instrumental in enhancing the revenue collection performance of the County Government of Kajiado. An efficient online billing system ensures that taxpayers receive accurate and timely bills, which is crucial for fostering trust and encouraging prompt payments. By automating the billing process, the county reduces errors and delays associated with manual billing methods. This not only improves transparency but also streamlines operations, making it easier for taxpayers to understand their obligations. The adoption of online billing aligns with global best practices and demonstrates the county's commitment to leveraging technology for improved financial management.

The online receipting process is concluded to be a critical component in strengthening the integrity and reliability of the revenue collection system. By providing immediate and accurate receipts upon payment, this process enhances accountability and builds confidence among taxpayers. The automation of receipting minimizes the risk of fraud and discrepancies, ensuring that all transactions are properly recorded and traceable. This transparency is essential for maintaining public trust and supports the county's efforts to improve compliance rates. The study underscores the importance of a robust online

receipting system in fostering a culture of accountability and efficiency within the county's financial operations.

The study finds that the online payment process significantly contributes to the convenience and accessibility of fulfilling tax obligations. By offering multiple electronic payment options, the county government reduces barriers to compliance, making it easier for taxpayers to remit payments at their convenience. The online payment system streamlines transactions, reduces the need for physical interactions, and lowers operational costs. This modernization of payment methods is essential in an increasingly digital world and reflects the county's responsiveness to the evolving needs of its constituents. The enhanced convenience and efficiency associated with the online payment process encourage timely payments and improve overall revenue collection.

The online response mechanism is concluded to be a vital element in fostering positive relationships between the county government and taxpayers. By providing timely and effective responses to inquiries, feedback, and concerns, the county demonstrates its commitment to transparency and customer service. An efficient online response system helps address issues promptly, reducing frustration and building trust among taxpayers. This engagement is key to enhancing taxpayer satisfaction and encourages voluntary compliance. The study emphasizes that a robust online response process not only resolves immediate concerns but also contributes to a more cooperative and supportive environment for revenue collection efforts.

5.4 Recommendations

Enhance the Online Billing Process: Since online billing process had a significant effect on revenue collection performance of county government of Kajiado. It was recommended that county management should prioritize the accuracy, timeliness, and transparency of the online billing process. Regular audits and updates to the billing system should be conducted to minimize errors and ensure clarity in tax obligations. Integration with predictive analytics tools can help forecast billing needs, enabling the system to adapt to evolving taxpayer demands.

Strengthen the Online Receipting System: Since online receipting process had a significant effect on revenue collection performance of county government of Kajiado. It was recommended that automating the receipting process further to ensure real-time issuance of receipts is essential. The county should adopt tamper-proof digital receipts that can be easily verified by taxpayers. Training programs should be organized for staff to optimize the use of the receipting system, and periodic reviews should be undertaken to assess and improve its efficiency.

Online Payment Process: Since online payment process had a significant effect on revenue collection performance of county government of Kajiado. It was recommended that management should explore the adoption of diverse and secure payment platforms, including mobile wallets, internet banking, and QR code-based systems, to make payments more convenient for taxpayers. The county should ensure that these platforms are user-friendly and secure against cyber threats. Additionally, periodic taxpayer satisfaction surveys should be conducted to identify areas for improvement in payment platforms.

Improve the Online Response Mechanism: Since online response had a significant effect on revenue collection performance of county government of Kajiado. It was recommended that establishing a dedicated response team with adequate training in customer service and digital tools is crucial. The county should adopt artificial intelligence-powered chatbots to provide instant responses to frequently asked questions, freeing up human resources for complex issues. An escalation matrix should be implemented to ensure that unresolved queries are addressed promptly by senior personnel.

Standardization of Electronic Payment Systems: Develop policies that mandate the standardization of electronic payment systems across all counties to ensure consistency, interoperability, and efficiency. Such standards should include minimum security requirements, performance benchmarks, and integration protocols.

Promote Digital Inclusion: Address barriers to accessing electronic payment systems by investing in digital literacy programs for taxpayers. Policymakers should ensure that all regions, including rural and underserved areas, have adequate internet connectivity and access to electronic payment platforms.

Incentivize Technology Adoption: Introduce financial incentives for counties adopting and scaling advanced electronic payment systems. This could include grants, tax credits, or subsidies for purchasing and maintaining technology infrastructure.

Strengthen Data Privacy and Security Policies: Implement robust policies to safeguard taxpayer data within electronic payment systems. Regular audits should be mandated to ensure compliance with data protection laws, and penalties should be imposed for breaches.

Public Awareness Campaigns: Launch nationwide campaigns to educate taxpayers on the benefits and use of electronic payment systems. These campaigns should emphasize the convenience, transparency, and security of these systems to encourage widespread adoption.

Foster Innovation Through Public-Private Partnerships (PPPs): Encourage collaboration between the government and private technology firms to develop and maintain cutting-edge electronic payment systems. PPPs can facilitate access to expertise, funding, and innovation while reducing the burden on public resources.

5.5 Areas for Further Research

Future research could expand on this study by conducting comparative analyses across multiple counties to evaluate the implementation and effectiveness of electronic payment systems in varying contexts. Such studies would offer insights into regional differences in adoption rates, technological infrastructure, and socio-economic factors that influence the success of these systems. By examining counties with diverse characteristics, researchers could identify best practices, challenges, and strategies for optimizing electronic payment systems to enhance revenue collection performance. These findings would provide a broader understanding of how electronic payment systems function under different conditions and offer valuable lessons for scalability and sustainability.

A second direction for further research involves the inclusion of moderating or mediating variables to unpack the nuanced relationships between electronic payment systems and revenue collection performance. For example, factors such as taxpayer awareness, digital literacy, enforcement of compliance mechanisms, or even organizational culture within county revenue departments could moderate the strength of the relationship. Investigating

these moderating effects would help explain why certain elements of the system, such as online billing and online response, exert stronger impacts than others. Similarly, mediation analysis could establish whether improvements in taxpayer satisfaction or trust act as intervening variables linking digital systems to enhanced revenue performance.

Future studies could also employ longitudinal designs to track how the effectiveness of electronic payment systems evolves over time. The present study adopted a cross-sectional approach, which captures associations at a single point in time but does not reveal changes in adoption and impact as systems mature. A longitudinal study would provide insights into whether the initial gains from digitisation are sustained, decline, or improve as county governments refine their systems and taxpayers become more accustomed to digital platforms.

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APPENDICES

Appendix I: Letter of Introduction to Respondents

Dear Respondent

RE: DATA COLLECTION

I am a Post Graduate Student at KeMU. In partial fulfillment for the degree, I am currently conducting a study on the **“Effect of Electronic Payment System on Revenue Collection Performance of County Government of Kajiado.”**

Your department has been selected to form part of the study. I kindly request you to assist me to collect data by completing the accompanying questionnaire. The data provided will be strictly for academic purpose and will be held in strict confidence. Thank you

Kind Regards.

Jonathan Rayiani Saigilu

Researcher,

KeMU.

Appendix II: Questionnaire

Please ensure that you accurately provide the needed information in accordance with the provided instructions. The material presented above is intended solely for academic reasons and will be treated with utmost confidentiality. Please kindly indicate the relevant response by checking the corresponding box or completing the blank area for each question. Welcome.

SECTION A: DEMOGRAPHICS

A.1 What is your highest academic qualification?

Master's degree Bachelor's Degree Diploma Certificate

A.2 Years of Service in the Institution

Less than 5 Years 5-9 Years 10-15 Years More than 15 Years

A.3 Please indicate your position

SECTION B: ONLINE BILLING PROCESS

Please indicate on the scale provided below by ticking the extent to which you agree with the following statements.

Strongly Agree=5, Agree=4, Uncertain=3, Disagree=2, Strongly Disagree=1

	Statement	1	2	3	4	5
B1	The online billing system integrates smoothly with other county payment systems					
B2	The online billing system integrates smoothly with other county payment systems.					
B3	Errors in billing are quickly resolved by the system.					
B4	The online billing system provides detailed and accurate breakdowns of charges					
B5	The system provides adequate support for forecasting and planning timely bill issuance for future revenue collection.					
B6	The system provides real-time notifications to officials when bills are delayed					

SECTION C: ONLINE RECEIPTING PROCESS

Please indicate on the scale provided below by ticking the extent to which you agree with the following statements.

Strongly Agree=5, Agree=4, Uncertain=3, Disagree=2, Strongly Disagree=1

	Statement	1	2	3	4	5
C1	The integration of the online receipting system allows for automatic updates across financial platforms.					
C2	Integration with external payment platforms (e.g., banks, mobile payments) is effective for generating receipts.					
C3	The receipts generated by the online system are accurate and free from errors					
C4	The online system accurately reflects the services or fees paid when generating receipts.					
C5	The timeliness of receipt generation has improved overall revenue collection efficiency.					
C6	Receipts are generated immediately after a payment is made via the online system.					

SECTION D: ONLINE PAYMENT PROCESS

Please indicate on the scale provided below by ticking the extent to which you agree with the following statements.

Strongly Agree=5, Agree=4, Uncertain=3, Disagree=2, Strongly Disagree=1

	Statement	1	2	3	4	5
D1	Application of e-payment system has enabled monitoring of financial transactions					
D2	The utilization of mobile service has made it easier to collect revenue					
D3	County government uses mobile payment system to curb fraud					
D4	e-banking payment system ensure management of revenue collection system					
D5	Online payment system is efficient and fast					
D6	E-banking payment systems provide convenience to customers					

SECTION E: ONLINE RESPONSE

Please indicate on the scale provided below by ticking the extent to which you agree with the following statements.

Strongly Agree=5, Agree=4, Uncertain=3, Disagree=2, Strongly Disagree=1

	Statement	1	2	3	4	5
E1	Better online user experiences for citizens					
E2	Improved internal efficiency and productivity.					
E3	Customers interact with us through phone calls or on social media to have their service needs facilitated					
E4	Scheduled payment reminders enhance revenue collection					
E5	Availability of online customer care					
E6	Contact Centre initiative promotes good customer service					

SECTION F: REVENUE COLLECTION PERFORMANCE


Please indicate on the scale provided below by ticking the extent to which you agree with the following statements.


Strongly Agree=5, Agree=4, Uncertain=3, Disagree=2, Strongly Disagree=1

	Statement	1	2	3	4	5
F1	Revenue from bus parks, markets and town parking are received and recorded using a digitized system					
F2	The E-Licensing platform has improved communication between the county officers and the business community					
F3	Digital payment has enhanced revenue collection through the end-to-end online service					
F4	Increase in collection of property taxes					
F5	Increase in the collection of license fees					
F6	Increase in the collection of entertainment taxes					

Thank you very much for your patience, cooperation and support in my research


Appendix III: NACOSTI


REPUBLIC OF KENYA


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