E-GOVERNMENT PLATFORM ATTRIBUTES AND REVENUE COLLECTION EFFICIENCY IN SELECTED PARASTATALS USING E-CITIZEN IN KENYA

BY

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MASTER OF SCIENCE IN COMMERCE

(FINANCE AND ECONOMICS)

KCA UNIVERSITY

2025

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE IN COMMERCE (FINANCE AND ECONOMICS) IN THE SCHOOL OF BUSINESS AT KCA UNIVERSITY.

OCTOBER 2025

DECLARATION

I verify that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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SUPERVISOR APPROVAL

I confirm that I have examined the research dissertation of

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And certify that all revisions that the dissertation panel and examiners recommended have been adequately addressed and that it meets acceptable academic standards.

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ABSTRACT

The increasing reliance on technology within public administration has made the integration of digital platforms essential for efficient revenue mobilization. This study investigated on the effect of key e-Government platform attributes like user compliance, system integration, and real-time reporting on revenue collection efficiency in selected Kenyan parastatals using the e-Citizen platform, with digital infrastructure as a moderating factor. The study was grounded in the Technology Acceptance Model (TAM), Diffusion of Innovation (DOI) Theory, Agency Theory, and the Resource-Based View (RBV) Theory to explain and understand the study. Additionally, the research adopted a descriptive-explanatory research design with primary data being collected using semi-structured questionnaires from 215 staff across seven parastatals. Analysis using Structural Equation Modelling (SEM) showed that system integration ($\beta = 0.31$, $p < 0.001$) emerged as the strongest predictor, followed by user compliance ($\beta = 0.22$, $p = 0.006$) and real-time reporting ($\beta = 0.18$, $p = 0.017$). The baseline model explained 55% of the variance in efficiency ($R^2 = 0.55$), while the moderated model incorporating digital infrastructure explained 59% of the variance in efficiency ($R^2 = 0.59$), indicating improved explanatory power. Moderation analysis revealed that digital infrastructure significantly strengthened the effects of user compliance ($\beta = 0.12$, $p = 0.043$) and system integration ($\beta = 0.15$, $p = 0.004$) on efficiency but had an insignificant effect on real-time reporting ($\beta = 0.05$, $p = 0.327$). The study concludes that strong system integration, timely reporting, and user compliance enhance accuracy and accountability, while robust digital infrastructure amplifies these effects. The findings offer actionable insights for policymakers to strengthen Kenya's revenue mobilization through strategic investment in infrastructure, digital literacy, and system reliability.

Key words: e-government, revenue collection efficiency, system integration, user compliance, real-time reporting, digital infrastructure, structural equation modelling, e-citizen, Kenyan parastatals

ACKNOWLEDGEMENT

First, I thank the almighty God for the gift of life, opportunity and the ability granted for the successful completion of this research dissertation. I am heartily thankful to my supervisor Dr. Munene Laiboni for his unwavering encouragement, insightful guidance, patience and invaluable support throughout the development and understanding of this dissertation. My deep gratitude to my parents, siblings and nephew for their continuous love and unlimited support which has been a cornerstone of my academic journey. Words are not enough to express my indebtedness to all my classmates and friends from whom I received valuable comments. May God Bless you mightily. Lastly, I thank the fraternity of KCA University for providing a conducive learning environment that has greatly contributed to the successful completion of this research project.

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DEDICATION

This dissertation is lovingly dedicated to my parents, Michael and Regina, whose sacrifices, prayers, and unwavering belief in me laid the foundation for my academic journey. To my siblings, Purity and Angelo, for their constant encouragement and support. I am especially grateful to my nephew, Rex, whose patience, joy, and unconditional love inspired me every step of this endeavour. I also extend my sincere appreciation to my friends for their unwavering support and encouragement throughout this journey. Above all, I give thanks to God for the strength, grace, and guidance that made this achievement possible.

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ACRONYMS AND ABBREVIATIONS

CFA	Confirmatory Factor Analysis
CPSI	Centre for Public Sector Innovation
DOI	Diffusion of Innovation
EFA	Exploratory Factor Analysis
EGDI	E-Government Development Index
E-Government	Electronic Government
ICT	Information & Communication Technology
KRA	Kenya Revenue Authority
MNA's	Members of National Assembly
MNCs	Multinational Corporations
NACOSTI	National Commission for Science, Technology and Innovation
OSR	Own-Source Revenue
PCA	Principal Components Analysis
SDGs	Sustainable Development Goals
SEM	Structural Equation Modelling
TAM	Technology Acceptance Model
UN	United Nations
VRIN	Valuable, Rare, Inimitable, And Non-Substituable Resource

OPERATIONAL DEFINITION OF TERMS

E-GOVERNMENT: It refers to use of modern technologies in information and communication (ICT), more so Internet applications, to improve public service quality, increase opportunities for democratic participation, and deliver various government services (Malodia, Dhir, Mishra, & Bhatti, 2021).

E-GOVERNMENT PLATFORMS: These are integrated digital systems or portals developed by a jurisdiction to provide public services electronically. In this study, e-government platforms include the e-Citizen portal in Kenya, which consolidates various government services and enables electronic payments and information access (Datta, Hoesfsloot, & Reyes, 2025).

REVENUE COLLECTION: The process through which government agencies gather public funds through official channels such as taxes, levies, and service fees, whether manually or electronically (Nekemia, Atukunda, & Nuwagaba, 2023).

EFFICIENCY: It refers to the optimum use of resources so as to achieve maximum output with minimal waste. In this context, it means collecting the most revenue with the least time, effort, and cost, while ensuring accuracy and transparency (Barbosa, Medeiros, & Simões, 2024)**.**

REVENUE COLLECTION EFFICIENCY: Refers to the effectiveness in generating, managing, and collecting revenues while minimizing errors, delays, and costs (KIPPRA, 2024).

PARASTATALS: These are semi-autonomous or fully government-owned organizations mandated to carry out specific state functions, such as KRA, NTSA, and BRS in Kenya.

E-CITIZEN: This is Kenya's official digital portal through which government services are accessed and paid for online. It centralizes services such as business registration, passport applications, and driving licenses (Sitinei & Kandiri, 2024).

DIGITIZATION: Refers to the obtaining, adopting, preserving and providing information in an organized and standardized computer format that is available on demand (The Kenya National Innovation Agency (KeNIA), 2024).

AUTOMATION: This is the leveraging of technology, robotics, programs or processes to achieve outcomes with minimal human input (The Kenya National Innovation Agency (KeNIA), 2024).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study.

The 21st Century has witnessed rapid technological changes and the evolution that are transforming public service delivery. These advancements are central in reshaping the structure and strategies of public service delivery which aims to foster transparency, efficacy and policy integration (Vecchi, Di Giulio, & Giancario, 2023). Among these innovations is e-government, which according to Malodia, Dhir, Mishra, & Bhatti (2021), refers to the use of digital innovations, more so, the web-based platforms to enhance service quality, promote citizen engagement, and simplify access to government services.

Lim (2023) also refers to e-Government as digital government, e-Gov, online government, and electronic governance. According to Sadik-Zada, Gatto, & Niftiyev (2024), the execution of e-government systems has necessitated reforms in public sector administration, fostering digital governance frameworks aimed at reducing corruption. Leveraging technology into public service delivery is emerging as a key tool for improving government operations' accessibility, efficiency, and transparency globally.

Although e-Government facilitates people access to public services, though several government entities encounter significant obstacles when bringing e-government into practice (Temba, 2024). The UN has urged governments to adopt digitized economies through support for policy programs. The United Nations E-Government Survey (2020), assert that different governments brought about remarkable efforts to respond to the global pandemic of COVID-19, which hastened up the adoption of e-governance initiatives.

The demand for efficient revenue collection systems has also driven technological innovations in public administration. Organizations and governments are currently attempting to transition to the use of innovative strategies to enhance their performance, especially in terms of raising

revenue collection. Mvanga (2023), suggested that manual collection methods has increased the effectiveness and adaptability of public sector revenue collection globally, prompting a transition from traditional to automated approaches.

Globally, the adoption of e-Government has gained momentum as governments seek to improve service delivery, enhance transparency, and foster citizen engagement. The UN's E-Government Development Index (2020) indicates steady growth in digital governance, with countries like India through the MeeSeva platform, Singapore through the PS21 Strategy Framework, and the United States through initiatives like the SAVE Award and Open Government Partnership showcasing successful integration of technology to streamline operations and reduce corruption (World Bank, 2020; Akida & Kandiri, 2024; Open Government Partnership, 2021). Similarly, in Europe, Androniceanu and Georgescu (2021), discovered that e-Government has been linked to economic growth, improved public participation, and accountability.

The global drive is mirrored in the African context, where the digital shift has been embraced to improve revenue mobilization and service access, although implementation challenges persist due to limited infrastructure, low digital literacy, and weak institutional frameworks. Sub-Saharan Africa's average tax-to-GDP ratio remains among the lowest globally at 17.2% (Akepe & Itoe, 2023). Countries like South Africa and Ghana have made progress through innovation hubs and digitization strategies, improving transparency and service efficiency (Abusamhadana, Bakon , & Elias, 2021). In contrast, Nigeria continues to face systemic barriers despite adopting e-Government tools (Dibie & Quadri, 2018; Oni, Anjorin, & Idowu, 2023).

In Kenya, the e-Citizen platform, launched in 2014, aimed to exemplify the technological shift by providing a centralized portal to access and pay for various government services (Datta, Hoesfsloot, & Reyes, 2025). Initially offering 41 services, as of March 2025, over 22,000

Government services were available from over 100 Ministries, Counties, Departments and Agencies. This is to imply that citizens and businesses can now access most of the government services at their home or office (Goverment of Kenya, 2025). The platform has promoted improved service delivery, increased revenue collection, and reduced bureaucratic inefficiencies through digital payments and real-time reporting (The National Treasury, 2025; Oliver, 2024). However, gaps remain in digital infrastructure, cybersecurity, and digital skills, which must be addressed to fully harness the platform's potential (Tenya, Maina, & Awuor, 2023).

The surge in revenue collection can be largely credited to improved user compliance facilitated by the platform's user-friendly interface and widespread accessibility. Moreover, the integration of various government services into e-Citizen has streamlined processes, reduced bureaucratic hurdles and minimized opportunities for corruption (The National Treasury, 2025). According to Oliver (2024), real-time reporting features have further bolstered transparency and accountability, allowing stakeholders to monitor transactions and service delivery metrics effectively.

Furthermore, this relationship does not occur in isolation. The role of digital infrastructure can either amplify or weaken the extent to which e-Government platforms enhance operational efficiency (Huang & Tang, 2025). Consequently, this study introduces digital infrastructure as a moderating variable that influences the strength of the relationship between e-Government platform attributes and revenue collection efficiency among selected parastatals in Kenya. To sustain and enhance the benefits of digital revenue management and public service delivery, it is vital to address infrastructural barriers and promote universal access to reliable digital services (Tenya, Maina, & Awuor, 2023).

1.1.1 E-Government

The United Nations (2024) defines e-Government as the use of technology to ensure delivery of government services for both corporations and citizens in an effective and efficient way. It is the optimal use of ICT to attain public goals through digital technology in government operations. Riany (2021), notes that e-government has become a top priority for most governments across the globe. This is because digitization promotes efficiency in service delivery, enhances transparency and accountability by reducing opportunities for corruption, and thus expanding access to services for both citizens and businesses. Additionally, governments recognize that digital platforms strengthen revenue mobilization and align public administration with global technological advancements, making e-government a critical driver of socio-economic development (Ugwu, et al., 2024).

Consequently, governments are now beginning to invest a significant portion of their budgets to the creation and deployment of e-government. Governments are embracing it as an innovative approach to service delivery reforms since it enhances the government's and the public's economic effectiveness and accountability (Balisany, Özgit, & Rjoub, 2022). Thus, Mahlangu & Ruhode (2021), asserts that, the subsequent e-government approaches to delivery support the push to transform and grow the public service, which include governments, citizens, and businesses rely constantly on technology to manage their daily affairs, including business-to-business (B_2B), government-to-business (G_2G), and government-to-citizens (G_2C) activities (Gonlepa, et al., 2022).

E-Citizen is Kenya’s integrated online portal, through which government departments and agencies offer a range of digital services, including applications for passports, driving licenses, business registration certificates, vehicle logbooks, and more (Sitinei & Kandiri, 2024; E-Citizen, 2025; Goverment of Kenya, 2025). It was developed mainly as a payment gateway,

which integrates with various electronic payment platforms, including mobile wallets like M-Pesa (Datta, Hoesfsloot, & Reyes, 2025).

With the high penetration of internet and smartphones in the country, e-Citizen has become a cornerstone of Kenya's economic infrastructure, enabling citizens, non-citizens, and businesses to access services and make payments online to the government. Since the launch of e-Citizen in 2014, it has been appraised for its efficiency and effectiveness, significantly reducing the need for voluminous paperwork in government services (The National Treasury, 2025). However, it has also faced challenges, including vulnerabilities to cyberattacks and technical glitches. In response, the Kenyan government has continually addressed these challenges by implementing updates and modifications to ensure the platform operates effectively. Additionally, it is critical to comprehend the constraints imposed by the system. The strengths of e-Citizen provide valuable lessons for other digital government service initiatives. These include the system's capacity for continuous updates, the enhancement of digital security measures, and the incorporation of new features based on the evolving needs of the government and society.

1.1.2 Revenue Collection Efficiency

The efficient collection of revenue is a crucial function for governments in ensuring they generate the funds needed to provide essential services. Mvanga (2023), defines revenue as the total sum of money received through licenses, parking fees, market fees, fines, penalties, and property sales, among other revenue streams that are within the control of governmental authorities. The ability of a utility to transform the billed revenue into actual cash according to Nekemia, Atukunda, & Nuwagaba (2023), is quantified by the efficiency of revenue collection. Significant revenue collection performance is required to accomplish this goal, as it fosters service delivery efficiency and institutional and national economic advancement (Barbosa, Medeiros, & Simões, 2024).

In addition, governmental officials view revenue collection as a way of promoting and overseeing socio-economic objectives in order to support the advancement of the country. The primary objective of government revenue collection seeks to ensure that citizens acquire services. The revenue obtained from the sources is insufficient to allow local governments to meet budgetary objectives, provide services to their citizens and minimize their reliance on grants from external resources and the federal government (Ugwu, et al., 2024).

1.1.3 User Compliance, System Integration, Real time reporting and Digital Infrastructure

The effectiveness of e-Government platforms in enhancing revenue collection depends not only on their technological design but also on how users interact with them, how seamlessly systems integrate, how promptly transactions are reported, and the robustness of the supporting digital infrastructure. These elements collectively determine the efficiency, reliability, and transparency of public financial management processes in Kenya's parastatals operating under the e-Citizen platform.

User compliance refers to the extent to which system users, both employees and clients adhere to established digital procedures and payment protocols. High levels of compliance reduce manual handling, minimize revenue leakages, and enhance accountability (Mandari & Koloseni, 2022). However, compliance alone is not sufficient if the digital systems are fragmented or unstable.

System integration ensures that different departmental systems communicate and share data effectively (Mulaydinov, 2024). Well-integrated systems reduce duplication, support seamless transactions, and enable accurate reconciliation of government revenues. In Kenya, parastatals such as the Kenya Revenue Authority (KRA), Business Registration Service (BRS), and National Transport and Safety Authority (NTSA) rely on integration with e-Citizen to process

transactions efficiently. Studies have shown that interoperability among such systems enhances efficiency and improves public trust (Owalo, 2024).

Real-time reporting represents the ability to capture, process, and analyse transactions instantly as they occur. It enables timely decision-making, reduces fraud, and enhances transparency in revenue management. Automated dashboards and live data systems allow public agencies to track payments and compliance in real time, strengthening audit processes and financial accountability (Njau, 2022).

The performance of these digital attributes, however, is largely dependent on the availability and quality of digital infrastructure including network connectivity, cloud capacity, secure servers, and ICT-skilled personnel. Where infrastructure is weak, systems may experience downtime, delayed transactions, and data loss, undermining overall efficiency (Omondi , Mwalili , & Thomas , 2022).

This study conceptualizes digital infrastructure as a moderating variable that influences the strength of the relationship between e-Government platform attributes, user compliance, system integration, and real-time reporting and revenue collection efficiency. When digital infrastructure is robust and reliable, these attributes interact more effectively to enhance revenue mobilization and service delivery. Conversely, inadequate infrastructure weakens these relationships, limiting the potential efficiency gains from e-Government systems.

1.1.4 Parastatals in Kenya

Parastatals in Kenya, established under the State Corporations Act (Cap 446), were initially created according to Cheluget, Sile, & Chege (2023), to serve white settlers but have since become vital instruments of national development. They operate in sectors such as infrastructure, finance, education, health, and agriculture, performing both commercial and regulatory roles under the oversight of parent ministries (SCAC, 2023). Kenya has over 260 parastatals, categorized into commercial enterprises, regulatory bodies, training institutions,

and regional development authorities yet only a few consistently generate profits (Daily Nation, 2025). This study purposively selects seven parastatals using the e-Citizen platform due to their frequent use in revenue collection and importance in public service delivery:

Kenya Revenue Authority (KRA) which was established under Chapter 469 of the Laws of Kenya, effective 1st July 1995, under the National Treasury and Economic Planning, with a mandate to assess, collect, and account for government revenue, and to enforce compliance with tax laws. As a semi-autonomous agency, it enhances efficiency, professionalism, and accountability in revenue administration, replacing the previously fragmented tax collection systems (KRA, 2025).

Business Registration Service (BRS), established under the BRS Act, 2015, to administer policies and laws relating to the registration of companies, partnerships, business names, bankruptcy, hire-purchase, and security rights. Its functions include registering companies, partnerships, business names, debentures, and charges, maintaining statutory records, and enforcing compliance with laws under its mandate (BRS, 2025).

National Transport and Safety Authority (NTSA) was established under the NTSA Act No. 33 of 2012, to regulate and enforce road transport safety in Kenya. Its mandate covers road safety policy implementation, vehicle registration and licensing, inspections and certification, regulation of public service vehicles, and development of road safety strategies. In recent years, it has leveraged digital platforms such as e-Citizen to provide online licensing, inspection, and compliance services, enhancing transparency and accessibility (NTSA, 2025).

The National Treasury which is anchored in Article 225 of the Constitution of Kenya, the Public Finance Management Act, 2012, and Executive Order No. 2 of 2023, to manage Kenya's public finance and economic policy. Its functions include formulating the national budget, mobilizing resources, managing public debt, overseeing revenue collection, and regulating capital markets, insurance, pensions, procurement, and financial institutions. Through digital platforms like

IFMIS and e-Citizen, the Treasury has enhanced efficiency, transparency, and accountability in managing public resources (The National Treasury, 2025).

Directorate of Criminal Investigations (DCI) was established under the Constitution of Kenya (2010) and the National Police Service Act (2011), as an investigative arm of the National Police Service. It is mandated to detect, prevent, and investigate serious crimes, collect intelligence, maintain criminal records, and conduct forensic analysis. It also coordinates Interpol affairs, executes directives from the Director of Public Prosecutions, and provides digitized services such as Police Clearance Certificates through the e-Citizen platform (DCI, 2025).

Directorate of Civil Registration Services which was established under the Constitution of Kenya and Executive Order No. 1 of 2025, to manage national identity and vital registration records. Its functions include registration of births and deaths, issuance of identification documents, development of the Digital ID (Maisha Namba), coordination of e-Citizen services, and enforcement of immigration and refugee policies, ensuring secure and efficient citizen services (Directorate of Civil Registration Services, 2025).

Directorate of Immigration Services (DIS) was established under Executive Order No. 2 of 2023 and operates under the State Department for Immigration and Citizen Services in the Ministry of Interior. Its mandate includes regulating entry, exit, residency, and citizenship in line with the Constitution (2010) and the Kenya Citizenship and Immigration Act (2011). It issues passports, work permits, and citizenship, registers non-citizens, provides consular services, and enforces immigration laws. Key services such as passport applications, visa processing, and permit issuance are now digitized through the e-Citizen platform (Directorate of Immigration Services, 2025)

1.2 Statement of the Problem

Efficient collection of revenue is indispensable for the financial sustainability of parastatals in Kenya, since it allows them to finance government programs and developmental initiatives. Nonetheless, inefficiencies like manual collection delays and user non-compliance have historically impeded the optimum collection of revenue in government organizations leading to revenue leakages thus undermining performance.

Manual tax collection occasionally presents local governments with several challenges. According to Abubakar (2023), manual systems are prone to errors, excessive paperwork, and limited data analysis, which increase costs and reduce transparency. The Commission on Revenue Allocation reports that counties collected only 65.9% of their own-source revenue targets in FY 2022/23; KES 37.81 billion of the targeted KES 57.37 billion (Nyongesa, 2023). Six of the seven lowest-performing counties that collected less than 50 percent had not adopted the e-Citizen platform, highlighting inefficiencies in manual systems.

Reluctance and unwillingness to embrace new technologies and bureaucratic stagnation can impede growth. According to Asomba, Ejim, Onyia, & Orji (2024), the integration of e-Government solutions is also made more difficult by some public official's resistance to change. Thus, the successful execution of e-Government efforts may be impeded by the absence of adequate legal frameworks and policies. Similarly, limited internet connectivity and weak digital infrastructure in remote areas pose challenges for accessing online services through the e-citizen in Kenya (Ugwu, et al., 2024).

Most prior studies focus on counties rather than national parastatals. Moreover, existing studies have primarily analysed digital infrastructure as an independent factor rather than a moderating variable that influences how digital platforms enhance efficiency. This study therefore seeks to fill this gap by assessing the effects of user compliance, system integration, and real-time reporting on revenue collection efficiency, with digital infrastructure as a moderating factor.

By bringing out significant prospects and obstacles, this study will give policymakers, government agencies, and technology developers with valuable insights to strengthen financial accountability, optimize digital revenue collection systems, and improve the overall efficiency of public revenue collection in Kenya.

1.3 Objectives of the Study

The main objective of this study was to assess the effect of e-Government platform attributes on revenue collection efficiency in selected Kenyan parastatals using the e-Citizen platform, and to evaluate the moderating role of digital infrastructure on these relationships.

1.3.1 Specific Research Objectives

1. To determine the effect of user compliance on revenue collection efficiency in selected parastatals using the e-Citizen platform.
2. To assess the effect of system integration on revenue collection efficiency in selected parastatals using the e-Citizen platform.
3. To evaluate the effect of real-time reporting on the effectiveness of revenue collection processes in selected parastatals using the e-Citizen platform.
4. To investigate the moderating effect of digital infrastructure on the relationships between user compliance, system integration, real-time reporting, and revenue collection efficiency.

1.4 Research Questions

1) To what extent does user compliance influence the efficiency of revenue collection in parastatals using the e-Citizen platform?
2) What is the effect of system integration on revenue collection efficiency in selected parastatals?

3) How does real-time reporting affect revenue collection efficiency in public institutions using the e-Citizen platform?
4) To what extent does digital infrastructure moderate the relationship between user compliance, system integration, real-time reporting, and revenue collection efficiency?

1.5 Scope of the Study

The research focused primarily on examining the influence of technology on revenue collection for parastatals in Kenya that have adopted the e-citizen interface since 2022. Among the many services offered by these government organizations are tax payments, business registration, licensing, and other online transactions made accessible by e-citizen. According to the e-citizen Secretariat, these platforms collectively process over 200,000 transactions daily, underscoring their strategic importance and relevance to this study (E-Citizen, 2025).

The research was bound to the period from 2022, when full adoption of e-Citizen by government agencies had been achieved. This study purposively targeted parastatals with the highest usage on the e-Citizen platform which will include the Kenya Revenue Authority (KRA), Business Registration Services (BRS), National Transport and Safety Authority (NTSA), The National Treasury, Directorate of Criminal Investigation (DCI), Civil Registration and the Directorate of Immigration Services. These parastatals were purposively selected because they represent the highest transaction volumes and are directly responsible for mobilizing significant government revenue streams, including taxes, business registration fees, motor vehicle licensing, police clearance certificates, civil registration, and immigration services.

The Kenya Revenue Authority (KRA) is responsible for tax collection and compliance, the Business Registration Services (BRS) provides business name, company, and partnership registration services. The National Transport and Safety Authority (NTSA) oversees motor vehicle registration, licensing, and road safety compliance. Additionally, Directorate of

Criminal Investigation (DCI) offers police clearance certificates through the platform. The Civil Registration manages birth and death registration services, and the Directorate of Immigration Services handles passport and visa applications. Limiting the scope to these parastatals ensures the study remained focused on organizations where e-Citizen has the greatest impact on revenue collection efficiency.

The study anticipates adopting an explanatory descriptive research design, utilizing semi-structured questionnaires that will aid in collecting primary data from key respondents within these parastatals. The findings from this research study will provide acumen into the role of digital platforms in enhancing the revenue collection efficiency, transparency, and compliance within government institutions in Kenya.

1.6 Significance of the Study

The inferences from the research will be expected to give insights on the influence of e-government, specifically on the e-Citizen platform, in enhancing revenue collection efficiency within Kenyan parastatals. The following groups will benefit from the study's findings:

1.6.1 Macroeconomic Players

Analysing how technology has promoted the efficiency of revenue collection within the parastatals in Kenya that have embraced the e-Citizen interface, might yield important insights on how best and efficient to apply it efficiently. The inferences of this research guide public policymakers through gaining valuable insights on how technology can be better leveraged to maximize revenue collection while ensuring that the process is easy and accessible for all citizens. Institutions like the National Treasury, Kenya Institute for Public Policy Research and Analysis (KIPPRA), and the Kenya Revenue Authority (KRA) greatly benefit from findings that can inform better policies and improve how digital payments will be managed in future.

1.6.2 Practitioners

The researcher anticipates that ICT specialists and technology developers will identify areas for improvement regarding the e-Citizen platform. The knowledge gained will contribute to the platform's increased efficiency and user friendliness, to improve security, system adoption, or real-time reporting. Finance officers and managers in parastatals will find useful solutions that will improve collections while reducing risks like fraud or backlog if they comprehend how user compliance, system efficiency, and real-time reporting affect revenue collection. Such policies may also impact the realization of Vision 2030 and Sustainable Development Goals (SDGs).

1.6.3 Researchers and Academicians

The study anticipates adding value to the growing scope of literature in Kenya and globally regarding technological advances in finance and e-governance. This study will offer important insights into what works and what doesn't, as well as how governments might leverage technology to build a more effective, transparent, and equitable financial system across the globe as countries advance toward digitized taxation along with online revenue collection. Ultimately, this study is important because it aims to improve ways that government services function for the public by making sure that the payment process is easy, safe, and valuable for the economic growth of Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, the empirical and theoretical literature detailing this study was discussed. The chapter presented the theoretical and literature review, research gaps, and the conceptual framework on the role of e-government platforms in enhancing the efficacy of revenue collection in parastatals using e-Citizen in Kenya.

2.2 Theoretical Review

A theory, according to Cooper & Schindler (2014), refers to a structured and interconnected set of ideas, propositions and definitions that try to explain and predict phenomenon or an occurrence. Salawu, Bolatitio, & Masibo (2023), stipulates that good research should be theory-driven and thus researchers create rational study structures using theoretical frameworks, then integrate them with the current study. Therefore, various theories; technology acceptance model (TAM), diffusion of innovation theory (DOI), agency theory and the resource-based view (RBV) theory, each theory providing a distinct lens for understanding how e-Government platforms influence revenue collection efficiency in parastatals using e-Citizen in Kenya.

2.2.1 Technology Acceptance Model (TAM)

Technology Acceptance Model was initially propounded by Fred Davis (1985) then Bagozzi & Warshaw (1992) later supported it. The model stipulates attitudes; perceived utility and usability indicate whether people will see the intention to adopt the system favourably or unfavourably (Marikyan & Papagiannidis, 2024). The Theory of Reasoned Action (TRA) is the building block of the technological acceptance model, which relies on belief, attitude, intent

and the relationship between user conduct and behaviour as explicating variables to describe the behaviour of information technology consumers (Lin, 2007).

TAM theory holds that subjective value is influenced by ease of use (O'Dea, 2024). The Technology Acceptance Model (TAM) posits that the acceptance of technology occurs in three stages. External factors, which specifically system design features, initiate cognitive responses characterized by perceived ease of use and the perceived usefulness. Thus, the cognitive responses ultimately lead to effective responses, which encompasses the perspectives and attitudes toward technology usage and intention, ultimately influencing usage behaviour (Davis, 1989; Davis, 1993). TAM represents behaviour through perceived utility, behavioural intention, and ease of use. The TAM's primary objective is to identify the reasons why users' resistance to new technology frequently prevents enhanced performance (Marikyan & Papagiannidis, 2024).

According to Amali, Katili, Suhada, Hadjaratie, & Mardlatillah (2022), TAM is one among multiple frameworks applied by researchers to predict and elucidate the multiple factors that drive user acceptance and adoption of emerging technological systems. The model further emphasizes on the intentions and perception of an individual in shaping their interaction with technological system (Macotiende, 2021).

Nonetheless, the practicality of TAM beyond the workplace is constrained, as its fundamental components do not adequately reflect a wide range of user job contexts and limitations (Adegbie, Enerson, & Olaoye , 2022). Thus, TAM models may be helpful for both within and outside of an organization for assessing user groups or applications or for reviewing technology or applications.

Furthermore, the Technology Acceptance Model (TAM) is effective to this study as it helps explain how users' perceptions of the e-Citizen platform influence their adoption and usage. The theory also identifies perceived usefulness and perceived ease of use as major driver in the

acceptance of technology. Using the model, one can understand the user behaviour by gauging the impacts that each of these factors has on the adoption of e-Citizen platform and identify the barriers to efficient revenue collection. In addition, with regards to public service delivery, TAM helps overcome users' resistance to new technologies and promote increased compliance with the e-Citizen platform for increased revenue generation. Therefore, TAM was significant in this study in explaining the extent to which user compliance influences revenue collection efficiency in parastatals using the e-Citizen platform.

2.2.2 Diffusion of Innovation Theory

Diffusion of Innovations (DOI) is a theory formulated by Everett Rogers (1995), aimed at elucidating the mechanisms, motivations, and pace at which new ideas and technologies disseminate. According to Rogers (1995), the theory allows one to evaluate innovations by examining its characteristics, also referred to as innovation attributes. Diffusion innovation is an approach by which an entity introduces a unique concept that extends throughout an organization until the other participants embrace it. According to the hypothesis, relative benefit, integration, intricacy, observability, and feasibility are the five innovation traits that affect acceptance (Soufiane & Ibrahim, 2021).

According to Rodgers, the process through which a new idea spreads among a social system's members over time is called diffusion. To arrive at a common understanding, participants in a communication process generate and exchange information (Rodgers, 1995). There are four key factors that affect how widely a new concept spreads: the invention time, the social structure, communication channels, and innovation. The five principal adopter groups are innovators, early adopters, early majority, late majority, and laggards (Rodgers, 1995). Those who are the first to try an innovation are considered innovators; those who symbolize opinion leaders are known as early adopters; the early majority individuals are those who want concrete proof that the innovation is effective before embracing it; those who are uncertain and embrace

innovation only after the majority do are the late majority; and those who embrace it last are known as laggards (Wilquer, Vale, & Corrêa, 2022).

The study of diffusion focuses on the spread of ideas throughout populations. By identifying these factors that affect the likelihood that people of diverse cultures would embrace an innovation, product, or practice diffusion goes beyond the two- phase hypothesis. Innovativeness is, therefore, the criterion used to classify adopters (Cherogony, 2022). Adoption is a gradual process that takes time since the community must adapt to new practices. The public must have an optimistic view of a new idea in order for it to be executed successfully, according to Olatunji (2009), who claims that adoption begins with perception. Adoption by consensus results in an integrated decision (Cherogony, 2022).

Despite the Diffusion of Innovation Theory's merits, it is unable to adequately explain why people are reluctant to embrace fresh ideas and offers no strategies for resolving this reluctance (Jalo & Pirkkalainen , 2024).

The Diffusion of innovation theory is applicable to this study because it points to a process through which new technologies (including the e-Citizen platform) diffuse in a social system. Furthermore, the theory has been central in explaining how community members will accept the platform based on premises like perceived relative advantage and observability. In addition, the theory classifies the adopters which can be useful in identifying the early and laggard adopters in the population, allowing gaining some knowledge on how fast the e-Citizen platform has been diffused and how to accelerate its adoption for effective revenue collection. Thus, the DOI theory effectively explains the influence of system integration on revenue collection efficiency.

2.2.3 Agency Theory

Agency theory was first proposed by Jensen & Meckling (1976) and highlights a contractual arrangement between a principal and an agent with the intent of delivering specific services.

Jensen & Meckling (1976), assert that the principal assigns the agent an obligation to make decisions. Agency relationships occurs when a principal contracts an agent, gives them the power to carry out tasks, and assigns decision-making authority. This dynamic relationship is evident in various contexts, such as between shareholders and managers or between stockholders and debt holders (Wamangwa, 2023).

With reference to public service administration, agency theory suggests that principals who in this study are the elected officials like MNAs should establish and set clear objectives for their agents, the revenue officers to meet revenue collection targets (Egbon, Okereka, & Sokoh, 2023). Moreover, citizens can also be considered as principals who employ the elected officials as agents, to represent their interests. In this context, the Agency Theory can serve as a framework to ensure elected officials remain accountable to their constituents.

Corporate governance frameworks are critical in avoiding agency conflicts. For example, independent boards of directors can provide oversight and ensure that executive activities align with shareholder interests (Jensen & Meckling, 1976). Furthermore, remuneration packages linked to performance criteria related to shareholder value production may incentivize managers to act in the best interests of shareholders, minimizing agency costs associated with management self-interest (Arunkumar, 2024).

Agency theory is applicable to this study because it explores how principals (elected officials), agents (revenue officers) conduct themselves towards purposes such as efficient revenue collection. The need for clear mandate, accountability and real time reporting is conveyed by this framework for satisfying the interests of the principals through the agents. Within the e-Citizen setting, agency theory puts more than emphasis towards effective monitoring and visibility as a means of minimizing information asymmetry, thereby ensuring that revenue officers deliver on their responsibilities and create better public service delivery.

The agency theory best explains the significance of real-time reporting to influence accountability in achieving effective public service delivery in this study. This allows principals to monitor agent actions and outcomes more effectively by ensuring timely, accurate reporting thus reducing information asymmetry which is a key concern in agency theory and enhancing the overall efficiency in public service delivery.

2.2.4 Resource Based View Theory

Resource Based View Theory (RBV) attributed to Edith Penrose (1959), is grounded on strategic management literature and focuses on the capacity and available resources of a firm. The main tenets of this theory include the idea of economic gain and the perception of an organization as an assortment of skills (Macotiende, 2021). The main idea behind it is that if an organization intends to achieve a state of sustained competitive advantage, it must acquire and control valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities and have a sustainable organization (O) in place that can absorb and apply them (Mailani, Hulu, Simamora, & Kesuma , Resource-Based View Theory to Achieve a Sustainable Competitive Advantage of the Firm: Systematic Literature Review, 2024).

According to resource-based theory, an institution can gain and maintain a competitive edge if they possess resources that are scarce, valued, not substitutable, and imperfectly transferable. The RBV has subsequently grown to be one of the most used contemporary tools for analysing sustained competitive advantage. The theory posits that a company's competitive advantage is determined partially by how well it uses all its available resources (Chepkoech, Gichana , & Agong, 2022).

The RBV theory allows firms and institutions to identify and categorize crucial resources for service delivery. Additionally, organizations can determine which of their resources meet VRIN criteria through the resource identification process, and a suitable institution can maximize resource management to gain a sustained competitive edge (Mailani, Hulu, Simamora, &

Kesuma , Resource-Based View Theory to Achieve a Sustainable Competitive Advantage of the Firm: Systematic Literature Review, 2024). Moreover, the Resource-Based View theory is applicable in this study because it is concerned with exploiting valuable, rare and inimitable resources in order to gain competitive advantage.

Under the e-Citizen platform, RBV theory elicits on how investment in digital infrastructure and e-governance engagements improves the efficiency of revenue collection. The theory suggests that by utilizing available resources effectively, such as human capital and technology, public institutions can improve service delivery. Additionally, Mailani, Hulu, Simamora, & Kesuma (2024), posits that it establishes a competitive edge in revenue generation, thus promoting sustainable development and better public financial management. In the public sector, this implies that parastatals leveraging advanced digital infrastructure and skilled personnel can improve service delivery, strengthen accountability, and gain a competitive edge in revenue generation, thereby promoting sustainable development and sound public financial management. Parastatals with robust ICT infrastructure, secure networks, reliable cloud servers, and adequate bandwidth are therefore better positioned to realize the full benefits of digital platforms (Omondi , Mwalili , & Thomas , 2022). Thus, digital infrastructure is conceptualized as a moderating resource, a strategic enabler that strengthens or weakens the relationship between e-Government attributes and revenue efficiency.

2.3 Empirical Review

Empirical review involves a scrutiny of several studies both locally and internationally that have been conducted on e-governance and revenue collection efficiency.

2.3.1 E-Government and Revenue Collection

E-government refers to the use of information and communication technologies (ICTs) to deliver public services and improve the governance structure (World Bank, 2020). E-Government platforms can help to enhance transparency, minimize corruption levels, and

improve efficiency in revenue collection. Malodia, Dhir, Mishra, & Bhatti (2021), assert that citizen's experiences interacting with the government are extensively enhanced by e-Government, which increases their confidence in both e-Government and the government.

In Kenya, the e-Citizen platform was introduced to streamline government services, including revenue collection, by providing a centralized digital platform for citizens and businesses to pay for services (The National Treasury, 2025). According to the then Cabinet Secretary for ICT Eliud Owalo the decision to automate government activities was paying off, as income steadily increased and service delivery was becoming more effective and efficient daily. The Kenyan government's efforts to digitize its services and migrate payments to the e-Citizen platform have resulted in the collection of KES 1 billion daily a show of the platform's growing contribution to national revenue (Owalo, 2024).

The lack of standardized processes for tax collecting in earlier practices served as a catalyst for this e-Government endeavours. Consequently, some organizations used information systems to help with revenue collection, while others employed agents and yet others used actual currency (Mtebe & Sausi, 2021).

Prior to the implementation of e-Government platform, Kenya's revenue generation was impeded by irregular and uncoordinated systems (KIPPRA, 2024). These inefficiencies and possible revenue leaks resulted from the use of various information systems by some corporations, the reliance on agents by others, and the large number of cash transactions. According to Nerius , Gichana., & Agong (2022), the lack of standardization in revenue systems through the integration of e-payment platforms led to revenue leakages and created gaps in accountability. However, they noted that the use of mobile payment systems has improved the effectiveness of revenue collection,

Similarly, the digitization of revenue operations has significantly and favourably impacted revenue collection and the growth in Nairobi City County. Njau (2022), found that revenue

collection efficiency was enhanced by automating cash handling, budgeting, and revenue control procedures. For revenue authority officials and taxpayers to get the most out of automation, the report suggested encouraging an environment of innovation and offering regular training. Additionally, a study by Limo, Koskei, & Oduor (2024), on the implementation of mobile payments in Nandi County, allowed taxpayers a simple and accessible means to pay, which improved the efficiency of the revenue system and made resources for development and public services available on time. This accessibility contributed to timely resource mobilization for public service provision and development initiatives.

TAM is crucial in describing how the adoption of emerging technologies is influenced by their perceived utility and ease of use. This concept is in line with empirical research that indicates user compliance, which is influenced by components like digital literacy and the rate of compliance with payment deadlines is an essential element of e-Government platforms' efficiency.

2.3.2 User Compliance and Revenue Collection Efficiency

User compliance is a critical factor in the success of e-Government platforms. Studies have shown that low compliance rates can undermine revenue collection efforts (Noura , 2024). In the context of Kenya’s e-Citizen platform, user compliance is shaped by several key factors, including ease of use, public awareness, digital literacy, and trust in the system. KeNIA (2024), noted that limited awareness and understanding of e-Citizen services, particularly among rural populations, have contributed to low compliance levels. This lack of awareness reduces the effectiveness of digital platforms in achieving full revenue mobilization potential.

Additionally, a research study by Adan, Simotwo, & Alexis (2023), in Mandera County revealed that inadequate adoption of information and communication technologies in revenue collecting had a detrimental impact on affordability, accessibility, and convenience, which led

to a 41.3% decrease in revenue collection. The study thus emphasized on the need for integrated ICT solutions to enhance revenue performance and compliance.

Moreover, Mandari & Koloseni (2022), investigated the moderating impacts of system interaction and the factors influencing individuals' preferences to continue using e-government services in Tanzania. According to their findings, users' desire of remaining using e-government services is effectively and significantly embedded by several factors, including adoption rate, digital literacy level and the rate of compliance with payment deadlines. The study additionally discovered that the impact of perceived utility and satisfaction on the intention to keep using these services is moderated by system interaction.

Thus, enhancing user compliance requires a multifaceted approach which involves public awareness campaigns, digital literacy training, and user-friendly system interfaces. Without addressing these enablers, the full benefits of platforms like e-Citizen in improving revenue collection efficiency may remain unrealized.

2.3.3 System Integration and Revenue Collection Efficiency

System integration refers to the ability of different Information Technology (IT) systems to work together seamlessly (Suresh , Amandeep , Mahima , & Zeeshan , 2021). It is pivotal in enhancing the efficiency of revenue collection within e-Government platforms.

Recent studies underscore the significance of system integration in improving revenue collection. For instance, a study by Nyariki & Odhiambo (2022), examined how cashless management systems affected the effectiveness of tax collection in Kisumu County. Their findings indicated that automated point-of-sale systems improved service delivery transparency, streamlined revenue collection, and made it easy to pay for goods and services. To increase full compliance levels, the study emphasised how crucial it is to educate taxpayers regarding the existence and advantages associated with such systems.

Additionally, a study by Kithinji, Muturi, & Kibati (2025), explored the relationship between Kenyan county governments' revenue collection performance and revenue system automation reported that automated systems provides a positive impact on revenue collection efficiency. Based on the study, integrated systems improve revenue collection efficiency, minimize human error, and streamline operations.

The DOI theory posits that attributes such as compatibility and complexity influence the rate of adoption. In the case of system integration, seamless leveraging across platforms simplifies usage and compliance which is vital in revenue collection in that without full compliance from business clients there will be low revenue collection (Omondi , Mwalili , & Thomas , 2022). System integration plays a pivotal role in enhancing revenue collection efficiency within e-Government platforms. Studies from Kisumu County and broader Kenyan county governments demonstrate the positive impact of automated and integrated systems on revenue collection. Addressing integration challenges, particularly between platforms like e-Citizen and existing legacy systems, is thus crucial for optimizing revenue collection processes and efficiency.

2.3.4 Real-Time Reporting and Revenue Collection Efficiency

Real-time reporting enables governments to monitor revenue collection activities as they occur, improving transparency, accountability, and decision-making processes within public financial management systems (Njau, 2022). Agency theory emphasizes the need for systems that decrease information asymmetry and improve accountability by stressing on the interactions between principals such as government officials and agents such as revenue officers. This, therefore, emphasizes on the significance of a strong real-time reporting systems set up to guarantee accountability and avert loss of revenue.

In Kenya, automated revenue collection system's deployment has demonstrated potential at the county level. For example, more effective revenue monitoring and planning has been made possible in Nairobi City County by the automation of revenue procedures like cash handling

and reporting (Omondi , Mwalili , & Thomas , 2022). Also, real-time tracking of data proved a possible deal in Busia County by the deployment of automated systems, which has allowed the county to swiftly spot any gaps or inefficiencies in obtaining data and take corrective measures (Mukhwaya, Ngala, & Mungai, 2023).

The transition from traditional to digital revenue collection systems in Nyandarua County addressed problems like financial mismanagement and corruption. According to Wangari (2023), own-source collection of revenue has been positively influenced by the integration of tax administration systems, online response procedures, and mobile payments. In order to enhance performance, the paper suggests implementing processes to entirely automate the process of collecting revenue, such as leveraging mobile payments and integrated tax administration systems.

Additionally, the implementation of cashless revenue collection systems that offer real-time updates on revenue collection and use has resulted from partnerships between counties and private sector organizations like Safaricom. This has promoted accountability and trust between county governments and their constituents (Chepkoech, Gichana , & Agong, 2022).

2.3.5 User Compliance, System Integration, Real time reporting and Digital Infrastructure

Digital infrastructure is termed as a prerequisite for the effective functioning of e-government platforms through increase in revenue collection, reducing the cost of collection and thus, optimizing service delivery (The National Treasury, 2025). It comprises reliable internet connectivity, secure payment systems, sufficient bandwidth, server capacity, cloud storage, and cybersecurity frameworks that sustain digital operations. In Kenya, however, one of the key challenges to realizing the objectives of the Digital Master Plan is the absence of a national digitalization fund. This gap has perpetuated disparities in infrastructure between urban and

rural areas, limiting the full adoption of e-Citizen services, particularly in remote regions (KIPPRA, 2024).

Empirical studies consistently underscore the crucial enabling role of digital infrastructure in enhancing organizational performance. A research study conducted by Mukhwaya, Ngala, & Mungai (2023), assessed at how tax collection performance was affected by cashless reforms in Kakamega County. The study found a positive correlation coefficient of ($r=0.45$) between enhanced revenue collection and the adoption of cashless systems. To improve revenue mobilization, the report recommended employing contemporary, efficient, and economical revenue collecting methods in addition to tough penalties for tax evasion.

Similarly, Omondi, Mwalili, and Thomas (2022) established that ICT infrastructure had a significant positive effect on revenue collection ($\beta = 0.252$, $p < 0.05$) in Nairobi City County, concluding that investment in ICT infrastructure significantly enhances tax administration efficiency. Complementing this, Rotich & Nzuki (2018), found that while ICT systems enhance revenue collection effectiveness, a significant portion of staff lacked adequate training on these systems. The study recommends comprehensive training programs to ensure staff can effectively utilize ICT tools for revenue collection.

These studies collectively suggest that digital infrastructure not only improves revenue systems but also enhances the effectiveness of other digital platform attributes such as user compliance, system integration, and real-time reporting. For instance, even when users are compliant with e-Government systems, weak network connectivity or frequent downtimes may limit the efficiency gains derived from their compliance. Similarly, system integration depends on robust infrastructure to ensure data interoperability and minimize delays in reconciliation across departments. Additionally, the benefits of real-time reporting accuracy, transparency, and instant data access can only be achieved under stable and secure technological conditions.

Further research conducted by Eshitika (2025), found that the transition to cashless systems led to significant improvements in revenue collection, reduced fraud, and enhanced transparency in Kakamega County. However, the study noted limitations such as resistance to change, training gaps, and system malfunctions. Similarly, Njau (2022), demonstrated that automation of financial oversight and budgeting processes in Nairobi City County positively influenced revenue performance. The study recommended continuous innovation and staff training to optimize automation benefits. These findings collectively emphasize that technology-driven reforms achieve sustainable success only when supported by reliable infrastructure and competent human resources.

According to RBV theory, crucial assets provide a sustainable competitive edge since they are valuable, scarce, unique, and non-replaceable. Digital infrastructure serves as such a resource in the larger context of e-government. RBV posits that institutions achieve superior outcomes when they effectively deploy valuable, rare, inimitable, and non-substitutable resources. In this context, digital infrastructure acts as a moderating variable that amplifies or diminishes the influence of e-Government platform attributes—user compliance, system integration, and real-time reporting on revenue collection efficiency. Thus, Investments in digital infrastructure, adoption of cashless systems, and comprehensive training programs are pivotal in optimizing revenue mobilization and ensuring efficient public service delivery.

2.4 Research Gaps

While the integration of technology from the user perception has been thoroughly examined in areas like e-commerce and the Internet, there is a deficiency of research on citizen acceptance of e-government services (ELKheshin & Saleeb, 2020). E-government might facilitate the provision of services. Developed nations are the focus of past e-government research studies (Riany, 2021). As a result, not much is understood about how e-government currently operates in developing nations and how it affects service delivery.

Additionally, previous studies suffer from either concentrating on a single facet of the effects of e-Government adoption or failing to employ an analytical framework. Ineffective governance, dependence on traditional revenue streams, and a lack of transparency make these financial issues worse and jeopardize long-term viability (Muthomi & Thurmaier, 2021).

Most of the past research relies on a technological predictability viewpoint, which is not of great value for comprehending and analysing how the context affects the implementation of e-Government. Furthermore, a substantial portion of the previous research was based on secondary data from several sources, which has been criticized for having little explanatory power and leaving out significant variables.

While existing studies have explored the general impact of e-government platforms on revenue collection, there is limited research on the specific role of e-Citizen in Kenya, particularly in the context of parastatals. Few studies empirically examine digital infrastructure as a moderating variable, despite theoretical support from RBV. This study aims to fill this gap by examining the factors that influence revenue collection efficiency through e-Citizen. The study will use primary data, which is perceived to be more factual and legitimate, to bridge this disparity.

2.5 Conceptual Framework

A conceptual framework is the researcher's integration of existing material on the explanation of an occurrence. It is a textual or graphic map that illustrates the concepts in a study's logical framework (Salawu, Bolatitio, & Masibo, 2023). Figure 1 gives an illustration of the conceptual framework of the research. The study comprises four independent variables and one dependent variable. The independent variables are user compliance, system integration, real time reporting and digital infrastructure while the dependent variable is revenue collection efficiency.

Figure 1

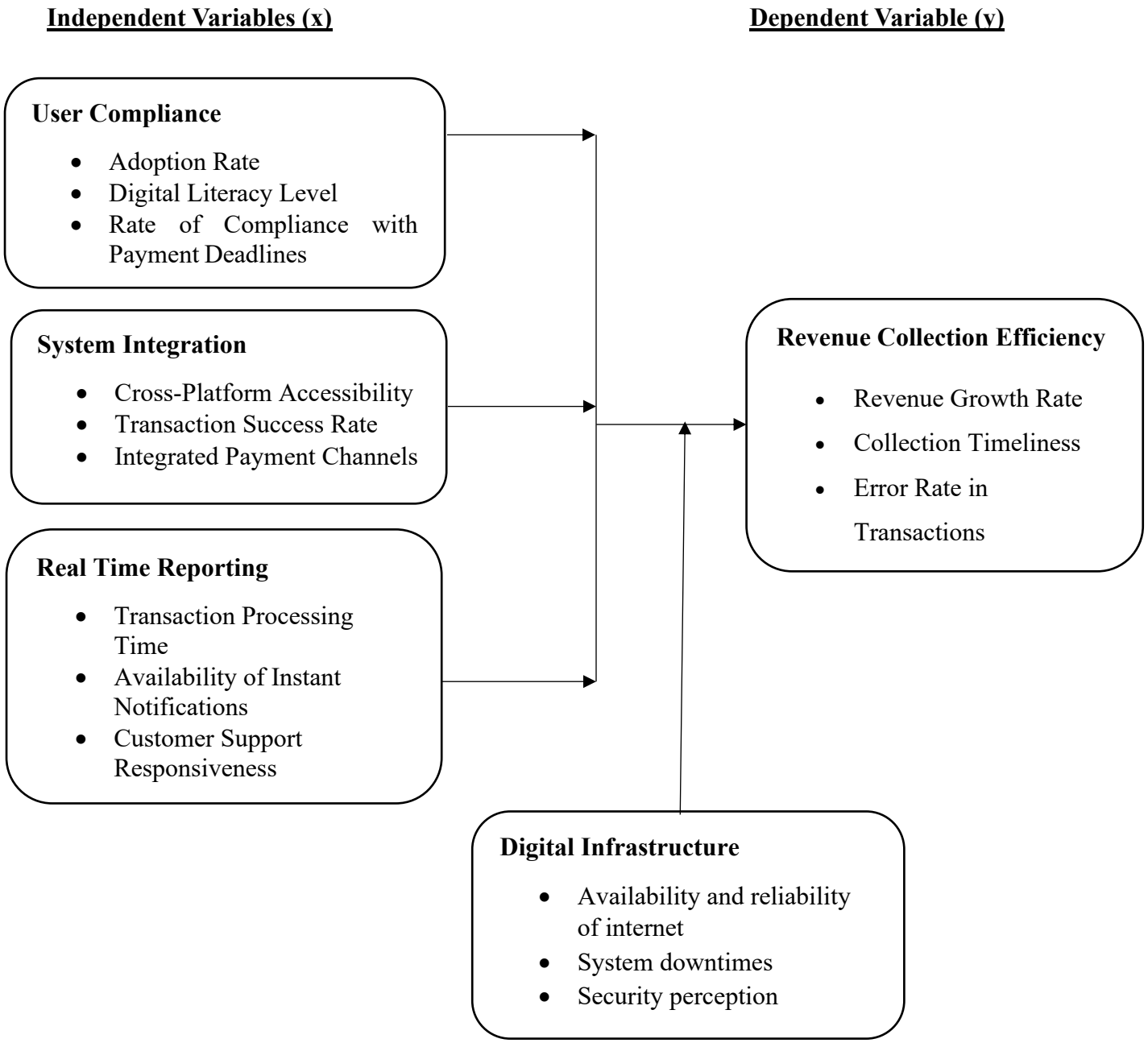


Figure 1: Conceptual Framework

2.6 Operationalization of Study Variables

Table 1: Operationalization of Study Variables

Operationalization of Research Variables	Indicators	Objective	Tool of analysis	Measurement scale
Revenue Collection Efficiency	1.Revenue Growth Rate Collection 2. Timeliness 3. Error Rate in Transactions	To examine the effectiveness and reliability of revenue collection systems in improving performance and reducing leakages.	Descriptive-Explanatory Statistics	Ordinal using 5 point Likert scale questionnaire
User Compliance	1. Adoption Rate 2. Digital Literacy Level 3. Rate of Compliance with Payment	To determine the effect of user compliance on revenue collection efficiency in selected parastatals using the e-Citizen platform.	Descriptive-Explanatory Statistics	Ordinal using 5 point Likert scale questionnaire
System Integration	1. Cross-Platform Accessibility 2. Transaction Success Rate 3. Integrated Payment Channels	To assess the effect of system integration on revenue collection efficiency in Kenyan parastatals.	Descriptive-Explanatory Statistics	Ordinal using 5 point Likert scale questionnaire
Real Time Reporting	1. Transaction Processing Time 2. Availability of Instant Notifications 3. Customer Support Responsiveness	To evaluate the effect of real-time reporting on the effectiveness of revenue collection processes.	Descriptive-Explanatory Statistics	Ordinal using 5 point Likert scale questionnaire
Digital Infrastructure	1. Availability and reliability of internet 2. System downtimes 3. Security perception	To investigate the moderating effect of digital infrastructure on the relationships between user compliance, system integration, real-time reporting, and revenue collection efficiency	Descriptive-Explanatory Statistics	Ordinal using 5 point Likert scale questionnaire

Source: Researcher (2025)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter covers and outlines the research methodology of the study involved, data collection technique, samples, sampling design that were used, piloting, validity and reliability, data analysis and ethical considerations in the research. Both the research tools and the techniques for data analysis are described as the target population.

3.2 Research Design

Research design is a detailed plan on how research is to be carried out and should provide an appropriate framework that guides the entire research process (Khanday & Khanam, 2023). According to Schindler (2021), it serves as a blueprint for collection, measurement and analysis of data within limited resources in order to address research questions.

This study adopted quantitative research approach using semi-structured questionnaires for data collection, with analysis to be conducted through SPSS. The research followed a combined descriptive-explanatory research design, to both describe the status of e-government platform usage and explain causal relationships, consistent with Bhale & Bedi (2023), for SEM-based studies (Mõttus , et al., 2020).

The descriptive aspect provided a clear picture of the current functionality and evaluation of e-government services delivered through the e-Citizen platform without altering participants' behaviour, making it suitable for answering "what" and "how" questions, and identifying patterns, associations, and trends (Adnan, Ghazali, & Othman, 2022).

The explanatory aspect investigated causal relationships between the independent variables; user compliance, system integration, and real-time reporting and the dependent variable;

revenue collection efficiency, with digital infrastructure as a moderating variable. Explanatory design was appropriate for exploring complex phenomena (Toyon, 2021). When combined with Structural Equation Modelling (SEM), the simultaneous validation of latent constructs and structural relationships will be enabled thereby enhancing the rigor and reliability of findings (Bhale & Bedi, 2023).

3.3 Target Population

The term "target population" represents a particular subgroup or segment of the broader population who fit specific requirements and traits that serves as the principal focus of a research project, education, or promotional initiative (Willie, 2024). The accessible population refers to a subset of the target population which the researcher can easily reach to select a representative sample (Newman & Gough, 2020). As a result, validity and applicability are improved and research questions are better tailored to the unique characteristics and needs of the population of interest (Willie, 2023).

Therefore, the target population for this study was 240 which included departments within the parastatals in Kenya that use the e-Citizen platform for revenue collection. Revenue Reporting Division within KRA, Finance and Accounts Division in NTSA, (BRS), Finance & Accounts department in the BRS and the Finance Section for DCI, Passport Control Section and Border Management Secretariat in DIS, Finance Department in Civil Registration Services and Directorate of Accounting Services and Quality Assurance of the National Treasury. According to Creswell & Creswell (2022), participants' interpretations of system-related attributes such as usability, accessibility, and efficiency are influenced by subjective realities, which can differ even under similar structural conditions. Further, Likert-scale instruments were inherently designed to capture individual-level attitudes and satisfaction levels, allowing for variation in responses (Mohd Rokeman, 2024). Below is a breakdown of the estimated number of staff targeted from each key department:

Table 2: Estimated Target Population by Department

Department/Unit	Estimated Number of Staff
Revenue Reporting Division (KRA)	80
Finance and Accounts Division (NTSA)	30
Finance & Accounts department (BRS)	20
Finance Section (DCI)	25
Border Management Secretariat (DIS)	40
Finance Office (Civil Registration)	25
Accounting Services and Quality Assurance (National Treasury)	20
Total	**240**

Not every parastatal in Kenya has been covered by this research due to the nature of this study which is on institutions which are involved in the active use of the e-Citizen platform in revenue collection. Some of the parastatals earn revenue in different ways or they do not have connections with the e-Citizen system. This would have resulted in inconsistencies and watered down the accuracy of the findings in case of inclusion of such organizations. The study reduced the scope to a set of departments within parastatals that has direct involvement in e-Citizen, which guaranteed the relevancy, comparability and validity of the outcomes in terms of assessing system-specific effects on revenue collection efficiency.

3.4 Sample Design

3.4.1 Sample Size

A sample according to Bhandari (2023), is a designated group from which a researcher collects data and represents a subset of the population. Sampling on the other hand is, choosing a number of subjects from a population as a representative of the whole population. Sample statistics are used to deduce population statistical traits (Nanjundeswaraswamy & Divakar, 2021). This means that one of the key variables influencing the overall research's outcome and

conclusions is sample size. This size of the sample is always expected to be less than the total population and should give a clear representation of the population.

Parastatals were purposively selected based on varying levels of revenue collection efficiency, which will be determined using objective criteria such as annual revenue reports from the published compliance statistics, and internal classifications where available to minimize selection bias. While the calculated sample size suggests a response rate of over 80%, the study acknowledges that achieving this may be challenging. To enhance feasibility, the study will accept a 5% margin of error as adequate, and employ strategies such as multiple follow-ups, official endorsements, and researcher-administered questionnaires to maximize participation.

The researcher determined the sample size of the study using Yamane (1967), formula for sample selection:

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

In this formula, the variables are:

n = the sample size

N = the population of the study

e = the margin error in the calculation estimated at 0.05 at a confidence level of 95%.

Substituting the values into the formula:

$$n = \frac{240}{1 + 240(0.05)^2} = \frac{240}{1 + 240(0.0005)} = \frac{240}{1 + 0.12} = {}^{240}/_{1.12}$$

$$n \cong 215$$

Thus, the calculated minimum sample size was 215 respondents.

3.4.2 Sampling Techniques

A purposive sampling technique was used to select parastatals with varying levels of revenue collection efficiency, within which stratified sampling was used to ensure representation from departments dealing directly with revenue collection operations. The parastatals selected were KRA, BRS, DCI, NTSA, DIS, Civil registration services and the National Treasury.

The study adopted purposive sampling because these institutions handle the largest volumes of digital transactions and directly influence national revenue targets. Stratified sampling was suitable as it ensures key subgroups are represented, allowing for more accurate comparisons and detailed analysis across different categories involved in revenue collection through the e-Citizen platform.

3.5 Data Collection Tools

The researcher collected primary data through questionnaires that were physically delivered and collected by trained research assistants from the respondents in the targeted departments with in-person follow-up to encourage completion. The questionnaire was suitable for this study since self-reported information on individual views, attitudes, beliefs, and values can only be obtained through a self-administered questionnaire. To ensure accuracy and reduce study bias, a pilot test was used to assess its reliability and validity prior to administration. The questionnaire was separated into multiple sections incorporating; open-ended, structured, and unstructured questions to fully address the study's goals.

3.6 Data Collection Method

The main means of collecting data were primary data collection method which involved administration of semi structured questionnaires that were filled by key stakeholders designed to directly gather information from the participants, including parastatal employees, and government officials. The sample responded to a series of questions aimed at finding out the

impact of adopting e-government services in Kenya as well as some of the factors that affect their use. Questionnaires that were used in the survey were physically delivered and collected by researcher assistants, were designed in a simple semi-structured manner to guarantee they are easy to comprehend without any assistance. A predefined date was set for the development and distribution of this questionnaire to the participants.

Data was collected using a 5-point Likert scale questionnaire with a range of 1 to 5. The questionnaire was divided into five sections: Sections A, B, C, D, E, and F. Section A were used to collect background and general information about the respondents, while Sections B, C, D, E were used to collect data about the four independent variables: digital infrastructure, system integration, user compliance, and real-time reporting, respectively. Section F was intended for collecting data about the dependent variable, which is the efficiency of revenue collection through the e-Citizen platform in some Kenyan parastatals.

3.6.1 Validity

Validity is the subjective assessment that the test assesses what it is intended to quantify in terms of relevance, and it is defined as a signal that makes it appear to be an acceptable assessment of some parameters (Anderson et al., 2024). In order to improve clarity and general appropriateness, the researcher took measures to ensure that uncertainties are eliminated during the instrument development process by using relevant terminology and concepts. The study adopted content validity to ensure the questionnaire accurately reflects the research objectives. Experts in e-government and revenue collection reviewed the instrument to confirm that all key concepts such as user compliance, system integration, digital infrastructure, and real-time reporting are adequately represented and clearly formulated. Construct validity was assessed using Exploratory Factor Analysis (EFA). Before factor extraction, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were conducted to test sampling adequacy and suitability of data for factor analysis.

Table 3: EFA Adequacy & Variance Explained

Statistic	Value	Recommended Threshold
KMO Overall	0.9	≥ 0.70
Bartlett's Test of Sphericity (χ^2, df)	1567.2 (136)	Significant at $p < 0.05$
p-value	< 0.001	≤ 0.05
Total Variance Explained (4 factors)	71.30%	≥ 50%

Sampling adequacy was supported with a KMO value of 0.90, and Bartlett's test was significant (χ^2=1567.2, p<.001). The four-factor model explained 71.3% of total variance, confirming that the measurement items sufficiently captured the underlying constructs. KMO values above 0.70 and significant Bartlett's test results ($p < 0.05$) confirmed data appropriateness.

3.6.2 Data Reliability

Reliability measure indicates how impartial or error-free a measurement is, which guarantees rational measurement throughout time and among the different objects in the instrument (Anderson et al., 2024). In the reliability evaluation, the researcher used Cronbach's alpha to verify the measurement procedures validity and clarity. This study considered a reliability coefficient of 0.70 and above which is considered "acceptable" in most research situations. Prior to administering the full instrument, both validity and reliability were tested through a pilot study. In addition to Cronbach's alpha, descriptive feedback from pilot participants was reviewed, leading to minor adjustments in wording, item clarity, and questionnaire structure. This process improved readability and ensured the instrument was well adapted for the target respondents.

Table 4: Reliability Results

Statistics	
Cronbach's Alpha	N of Items
.841	5

The reliability analysis was conducted, and the five items achieved a Cronbach's Alpha of .841, indicating strong internal consistency.

3.7 Pilot Study

According to Chhetri & Khanal, (2024), a pilot study was carried out to reduce potential instrumentation inaccuracy and improve the validity and reliability of the data collected. The pilot involved a small number of respondents of 15 staff members from departments that handle revenue services in ministries such as the Ministry of Lands or Kenya Wildlife Service (KWS) that are not part of the targeted parastatals. Feedback from the pilot was used to adjust the questionnaire for clarity, consistency, and content relevance before rolling it out in the main data collection phase.

3.8 Data Analysis

Data analysis is the systematic process of examining raw data to generate meaningful insights (Alem, 2020). It involves breaking down complex information into simpler components and reconstructing them to produce actionable conclusions. According to Mohaiminul (2020), it transforms numerical data into valuable knowledge for decision-making.

The study used both descriptive statistics to summarize data and inferential methods to test hypotheses. Specifically, Structural Equation Modelling (SEM) was used to examine relationships between user compliance, system integration, real-time reporting, and revenue collection efficiency, with digital infrastructure as a moderator. SEM is appropriate because it simultaneously evaluates both the measurement model (construct validity and reliability) and the structural model (causal paths) while accounting for measurement error (Bhale & Bedi, 2023). This dual capability enhances the precision of the analysis by accounting for measurement error and allowing the evaluation of direct and indirect effects.

Prior to Structural Equation Modelling (SEM), Exploratory Factor Analysis (EFA) was conducted to identify the factor structure of the constructs. This was be followed by Confirmatory Factor Analysis (CFA) to validate the measurement model. SEM was then conducted to test hypothesized causal and moderating relationships, thereby addressing measurement error and ensuring stronger validity of results. For responses to open-ended questions, thematic content analysis was be used to complement quantitative results by capturing deeper insights into participants' perspectives on e-Citizen adoption and revenue collection efficiency.

Moreover, frequency analysis and correlation were done after the factor and structural equation modelling to summarize the responses to the key constructs of the study. This was required to give a descriptive picture of how the respondents viewed the user compliance, system integration, real-time reporting, digital infrastructure and efficiency in revenue collection on the e-Citizen platform. The patterns of the distribution of the responses were recorded in frequency tables that established the prevailing patterns of agreement or disagreement in a five-point Likert scale. The above results not only depicted baseline perceptions but also placed the following inferential analyses in context. Similar to other research findings, frequency output was used to supplement SEM where it showed the practical adoption and compliance rates in parastatals.

The statistical analysis will be conducted using SPSS version 29 for preliminary descriptive statistics and AMOS for SEM at a significance level of $p \leq 0.05$.

Model 1: Main Effects (No Moderation)

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y - Revenue Collection Efficiency

β_0 - Regression Constant term

β_1, β_2, and β_3 - Coefficients for the independent variables which represent the change in Y for each increment change in X_1, X_2, and X_3.

X_1 - User Compliance

X_2 - System Integration

X_3 - Real-time Reporting

ε - Error Term

Model 2: Moderated Regression (Including Interaction Terms)

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 M + \beta_5 (X_1 + M) + \beta_6 (X_2 + M) + \beta_7 (X_3 + M) + \varepsilon$$

Where:

M - Digital Infrastructure (Moderating Variable)

$(X_{(1,2,3)} + M)$ - Interaction terms (e.g., User Compliance × Digital Infrastructure)

β_4 - Coefficient of the moderator

β_5, β_6, and β_7 - Coefficients for interaction effects

The critical p-value will be set at p=0.05

3.9 Diagnostic Tests

Diagnostic tests were performed to verify whether the data satisfies the assumptions of regression models, because any data that does not result in erroneous results thus giving a wrong conclusion of the study. Diagnostic assessments that the study conducting will be to

evaluate the normality and multicollinearity of the residuals. These tests ensured that regression assumptions were not violated, thereby supporting the validity of inferential conclusions.

3.9.1 Normality Test

Regression analysis is based on the underlying assumption that the data should follow a normal distribution. By studying skewness, which evaluates the degree that a distribution corresponds a symmetrical normal, one can assess this conformity to normalcy. A high skewness denotes more small values meaning negative skewness or large values to imply positive skewness, whereas a skewness value of zero implies perfect symmetry. To assess the residuals' normalcy, this study, Shapiro-Wilk test was used.

3.9.2 Homoscedasticity Test

Homoscedasticity describes a situation in which the error term is the same across all values of the independent variables (Shrestha, 2020). Homoscedasticity ensures uniform variability of residuals across the entire spectrum of predicted values. This assumption is critical for the dependability of statistical inferences derived from regression models and ensuring that predictions remain reliable across the entire spectrum of independent variables. The study employed the use of Breusch-Pagan test to assess homoscedasticity.

3.10 Ethical Considerations

This study complied with the ethical guidelines of KCA University and the National Commission for Science, Technology and Innovation (NACOSTI) to safeguard the rights and dignity of participants and ethical approval for the study was obtained from both institutions prior to data collection.

The research poses minimal risks such as time burden, mild discomfort, or perceived pressure at the workplace. These were mitigated by assuring privacy of the responses, voluntary participation and withdrawal is allowed at any stage. Confidentiality was upheld by use of

codes instead of names and reporting findings only in aggregate form, ensuring individuals and departments cannot be identified. While full anonymity is not possible due to departmental targeting, privacy will be protected throughout the process.

Informed consents were obtained through a written form in Appendix 1 outlining the study purpose, procedures, potential risks and benefits, confidentiality measures, and the right to withdraw. Participants will also have an opportunity to ask questions before signing. All data was stored in password-protected files on encrypted devices accessible only to the researcher and supervisor. It was retained for five years for academic reference before being securely deleted, in line with the Kenyan Data Protection Act, 2019. Finally, findings will be shared not only through academic publication but also with policymakers, parastatal management, and civil society through policy briefs, workshops, and presentations, ensuring the study contributes to practical improvements in the efficiency of revenue collection.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presented the study results from 215 respondents. The findings covered demographic characteristics and involvement in revenue collection processes. Data analysis provided insights into gender, age, education, departments, years of service, and direct engagement in finance or ICT roles, which were significant in addressing the study objectives.

4.2 Response Rate

The study achieved a 100 percent response rate, with all 215 targeted respondents providing complete responses. This was made possible because data collection was coordinated in collaboration with departmental heads, ensuring respondents were available and encouraged to participate during official working hours. The use of both online and physical follow-ups also minimized non-responses. While such a complete response rate is uncommon in most surveys, it was plausible in this study due to the structured and supervised administration process within a clearly defined population of parastatal staff. This high response rate enhanced the reliability and accuracy of the findings, while minimizing concerns of non-response bias. The significance of this outcome lay in its ability to provide a sufficiently comprehensive and representative dataset, thereby strengthening the generalizability of results across Kenyan county governments. Feedback from the pilot study confirmed that most items were clear and relevant, though minor rewording was made to simplify technical terms. The revised version was then administered to the main sample.

4.3 Demographics Results

Gender

Table 5: Gender

		Frequency	Valid Percent
Valid	Female	101	47.0
	Male	114	53.0
	Total	215	100.0

The sample comprised 114 males (53 percent) and 101 females (47 percent), showing a fairly balanced representation. This indicated inclusivity in perspectives across genders. The significance of these results was that both male and female employees actively contributed to revenue collection, ensuring that gender considerations informed the study's conclusions and recommendations.

Age

Table 6: Age

		Frequency	Valid Percent
Valid	18–25	18	8.4
	26–35	58	27.0
	36–45	41	19.1
	46–55	85	39.5
	Over 55	13	6.0
	Total	215	100.0

The majority of respondents were aged 46–55 years (39.5 percent), followed by 26–35 years (27 percent). The least represented group was 18–25 years (8.4 percent). These findings were

significant as they highlighted that revenue collection functions were primarily managed by experienced employees, providing stability and institutional knowledge in digital adoption.

Education

Table 7: Education

		Frequency	Valid Percent
Valid	Diploma	71	33.0
	Bachelor's Degree	60	27.9
	Master's Degree	54	25.1
	PhD	30	14.0
	Total	215	100.0

Educational levels showed 33 percent held diplomas, 27.9 percent bachelor's degrees, 25.1 percent master's, and 14 percent PhDs. This indicated a highly educated workforce. The significance of these results was that respondents had the academic background necessary to understand and engage effectively with digital platforms, enhancing revenue collection efficiency through e-Citizen systems.

Department/Unit

Table 8: Department/Unit

	Frequency	Valid Percent
Revenue Reporting Division (KRA)	69	32.1
Finance and Accounts Division (NTSA)	25	11.6
Finance & Accounts department (BRS)	21	9.8
Finance Section (DCI)	26	12.1
Border Management Secretariat (DIS)	38	17.7
Finance Office (Civil Registration)	19	8.8

	Accounting Services and Quality Assurance (National Treasury)	17	7.9
	Total	215	100.0

Respondents represented diverse departments, including KRA (32.1 percent), DIS (17.7 percent), NTSA (11.6 percent), BRS (9.8 percent), DCI (12.1 percent), Civil Registration (8.8 percent) and National Treasury (7.9 percent). This diversity ensured that the sample captured experiences from multiple parastatals directly engaged in revenue collection, integration, and digital service delivery through the e-Citizen platform. This departmental distribution showed inclusivity of various parastatals. Its significance lay in capturing broad operational perspectives, ensuring the findings reflected experiences across multiple agencies, thus enhancing the study's analysis of system integration and compliance.

Years of Service

Table 9: Years of Service

		Frequency	Valid Percent
Valid	Less than 1 year	28	13.0
	1–4 years	34	15.8
	5–7 years	51	23.7
	8–10 years	70	32.6
	Over 10 years	32	14.9
	Total	215	100.0

Most respondents had served 8–10 years (32.6 percent) and 5–7 years (23.7 percent). Only 13 percent had less than one year of experience. These findings were significant because participants possessed substantial institutional knowledge, enhancing the credibility of their views on digital infrastructure, compliance, and efficiency within revenue collection processes.

Table 10: Involvement with revenue collection, finance, or ICT services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	215	100.0	100.0	100.0

All respondents (100 percent) confirmed direct involvement in finance, ICT, or revenue collection. This ensured that responses were based on first hand professional experience. The significance of these findings was that the study relied on knowledgeable participants, enhancing the validity and applicability of results in evaluating efficiency within e-Citizen–enabled revenue collection processes.

4.4 Normality Testing

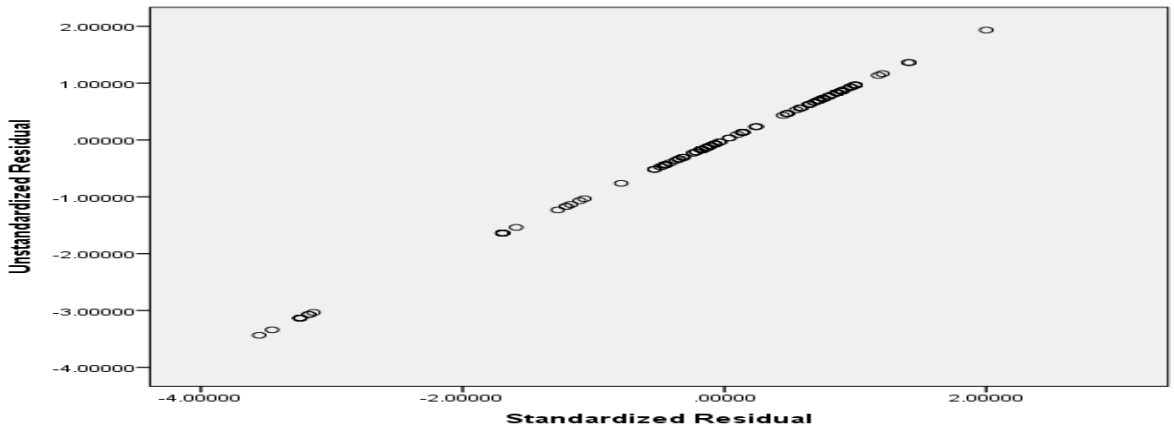
Table 11: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.007	215	.120	.922	215	.201
Standardized Residual	.007	215	.150	.922	215	.216

a. Lilliefors Significance Correction

The Kolmogorov–Smirnov and Shapiro–Wilk tests showed p-values greater than 0.05 for both unstandardized and standardized residuals, indicating that the residuals did not significantly deviate from normality. This suggested that the assumption of normal distribution was met, confirming the regression model's suitability and supporting the reliability of the study's results.

Figure 2: Scatterplot for Testing Homoscedasticity



The scatterplot revealed a random and evenly dispersed pattern of residuals around the line of best fit, indicating homoscedasticity of the residuals does not vary between the predicted values. Together with the normality test results ($p > 0.05$ for both Kolmogorov–Smirnov and Shapiro–Wilk), these confirm that regression assumptions were satisfied, supporting the reliability of the model estimates in explaining the efficiency in terms of revenue collection.

4.5 Descriptive Statistics

Table 12: Descriptive Statistics

Construct	Mean	SD	Skewness	Kurtosis
User Compliance (UC)	3.74	0.68	-0.21	-0.28
System Integration (SI)	3.56	0.72	-0.15	-0.35
Real-Time Reporting (RTR)	3.69	0.71	-0.18	-0.31
Digital Infrastructure (DI)	3.41	0.75	-0.09	-0.22
Revenue Collection Efficiency (RCE)	3.77	0.66	-0.24	-0.19

The descriptive results show that mean construct scores ranged between 3.41 and 3.77, suggesting moderately positive perceptions of user compliance, system integration, real-time reporting, digital infrastructure, and revenue collection efficiency. Standard deviations (0.66–0.75) indicate moderate variability, while skewness and kurtosis values fell within ±0.35, supporting approximate normality and justifying SEM application.

4.6 Frequency Results

4.6.1 Objective 1: To determine the effect of user compliance on revenue collection efficiency in selected parastatals using the e-citizen platform.

Table 13: Responses on User Compliance and Revenue Collection Efficiency

Question	Strongly	Disagree	Neutral	Agree	Strongly Agree

	Disagree				
Employees and service users in our organization frequently use e-Citizen for accessing government services.	13 (6.0%)	3 (1.4%)	13 (6.0%)	101 (47.0%)	84 (39.1%)
Our clients have sufficient digital literacy to complete payments via e-Citizen.	9 (4.2%)	1 (0.5%)	15 (7.0%)	115 (53.5%)	75 (34.9%)
We observe a high rate of user compliance with payment deadlines via the e-Citizen platform.	10 (4.7%)	2 (0.9%)	16 (7.4%)	103 (47.9%)	84 (39.1%)
Our staff are well-trained to support users in using e-Citizen for revenue-related transactions.	8 (3.7%)	1 (0.5%)	12 (5.6%)	100 (46.5%)	94 (43.7%)
Enhanced user awareness has contributed to improved revenue collection through e-Citizen.	14 (6.5%)	6 (2.8%)	15 (7.0%)	100 (46.5%)	80 (37.2%)

The findings revealed that user compliance significantly influenced revenue collection efficiency through e-Citizen. Most respondents agreed that employees and clients frequently used e-Citizen (86.1%), possessed sufficient digital literacy (88.4%), and complied with payment deadlines (87%). Additionally, 90.2% confirmed that staff were well-trained to assist users. Enhanced awareness was also acknowledged by 83.7% of respondents as a contributor to improved revenue performance. Overall, these results indicated that digital literacy, staff capacity, and awareness initiatives collectively strengthened compliance, thereby positively affecting the efficiency of revenue collection in the selected parastatals.

From the open-ended questions, respondents indicated that lack of awareness and training were some of the factors that prevented them to adhere to e-Citizen procedures. According to some of the respondents, employees were not well instructed on how to navigate the platform resulting in them making errors when making transactions. Others said that constant change of

system features without adequate communication led to confusion, and they could not always stick to procedures. Some respondents indicated that older employees were more resistant to change, which slows the adoption, and others mentioned the fear of accountability expectations that was a burden. In general, the participants stressed that despite the increase of transparency caused by compliance, insufficient training and lack of clarity were also important obstacles.

The findings revealed that user compliance had a great improvement on revenue collection performance at the sampled parastatals since most of the respondents indicated that clients used e-Citizen often, met their deadlines, and were sufficiently digitally literate. These results resonated with Noura (2024), who described that when users did not meet deadlines or did not use digital platforms regularly, the government recorded revenue loss since they could not receive the expected revenues on time or even lose them altogether. Such risks were minimized in this study by a high level of compliance, and the process of mobilizing the revenues was eased.

Furthermore, KeNIA (2024), asserted that lack of awareness and poor digital literacy, primarily in the rural regions, reduced the rates of compliance since the citizens were either not aware of the existence of the e-Citizen services or could not use them productively. This aligned with the findings at hand since high awareness and training among the staff members would promote proper system utilization, hence increasing compliance. Adan et al. (2023), also demonstrated that low ICT adoption in Mandera lowered affordability, accessibility, and convenience, which on the one hand discouraged compliance and a 41.3-percent reduction in revenue collection. In comparison, the current findings indicated that compliance would be enhanced by the adoption of ICT systems and hence efficiency.

The study established that user compliance has a significant positive influence on revenue collection efficiency. These results were consistent with the Technology Acceptance Model (TAM) according to which emphasizes that technology adoption is driven by perceived

usefulness and perceived ease of use. Thus, the perception was enhanced by interfaces that were easy to use, training of staff, and digital literacy initiatives, which increased compliance and speedy collection of revenue. The results align with past studies that found compliance improves system effectiveness when users perceive tangible benefits. This suggests that enhancing digital literacy programs and reducing system complexity could further increase compliance, thereby strengthening the efficacy of revenue collection.

4.6.2 Objective 2: What is the effect of system integration on revenue collection efficiency in selected parastatals?

Table 14: Responses on System Integration and Revenue Collection Efficiency

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
E-citizen is well integrated with mobile money platforms like M-Pesa and bank payment systems to improve payment processing.	9 (4.2%)	6 (2.8%)	16 (7.4%)	94 (43.7%)	90 (41.9%)
The e-Citizen platform is well integrated with our internal revenue and financial management systems.	14 (6.5%)	3 (1.4%)	13 (6.0%)	108 (50.2%)	77 (35.8%)
Our institution uses multiple integrated digital payment channels on e-Citizen.	14 (6.5%)	2 (0.9%)	17 (7.9%)	95 (44.2%)	87 (40.5%)
System integration has reduced redundancy and data duplication.	9 (4.2%)	4 (1.9%)	17 (7.9%)	106 (49.3%)	79 (36.7%)

System integration contributes to faster service delivery.	9 (4.2%)	2 (0.9%)	17 (7.9%)	106 (49.3%)	81 (37.7%)

The findings showed that system integration positively influenced revenue collection efficiency in parastatals. A large proportion of respondents agreed that e-Citizen was well integrated with mobile money and banking systems (85.6%) and connected to internal financial management systems (86%). Additionally, 84.7% confirmed the use of multiple payment channels, while 86% agreed integration reduced redundancy and duplication. Similarly, 87% indicated faster service delivery. Overall, the results demonstrated that integrated systems enhanced convenience, accuracy, and speed, thereby strengthening efficiency in revenue collection processes.

Results from the open-ended questions, the respondents proposed that there was still unfinished integration within the departments and agencies. Many participants described that there were delays due to revenue information on other systems not being synchronized with e-Citizen easily. Others observed that there was duplication and discrepancy during manual reconciliation. The participants offered solutions like the complete connection between the county and national systems, automatic error detection, and easy to use dashboards. It was also suggested by others to establish relationships with banks and mobile service providers to enhance payment flows. Most of them concurred that achieving better integration of the systems would help in minimizing the redundancy, enhancing transparency and efficiency when it comes to the tracking and consolidation of revenue.

The findings revealed that system integration was a decisive element in the collection efficiency of revenue in the sampled parastatals. The overwhelming response of the respondents was that integration with mobile money like M-Pesa and bank facilitated the processing of payments and convenience. This was in line with Nyariki & Odhiambo (2022),

who discovered that automated point-of-sale systems in Kisumu County improved transparency, simplified the process of tax collection, and facilitated payment of services. They said that this integration not only made transactions easier, but also promoted compliance by creating less delays and payment obstacles.

It was also discovered by the study that integration with internal financial systems made duplication minimal and enhanced accuracy. This observation echoed the results of Kithinji et al. (2025), who have indicated that automation of revenues led to a higher rate of efficiency due to the minimization of human error and simplified processes. Their analysis has highlighted that with a well-working system, governments get to enjoy efficiency in revenue records, and accounting reconciliation, which eventually leads to the enhancement of the performance of compliance and collection. The key explanation of these findings was the Diffusion of Innovation (DOI) theory that emphasized compatibility and complexity as influencers of adoption. In the given work, e-Citizen compatibility with other financial sites simplified the process and made the system more convenient to utilize. Omondi et al. (2022), observed that compliance leads to seamless integration, and gaps in integration discourages users.

System integration surfaced as the most influential factor in revenue collection efficiency which aligns with the Diffusion of Innovation (DOI) Theory, particularly the constructs of compatibility and complexity. Thus, the findings indicated that integrated systems positively influenced service delivery, user experience, and helped to collect revenue efficiently, transparently, and in time. The management of integration issues with legacy systems was still necessary to encourage faster adoption and sustained use as a way of maximizing revenue performance. The findings expand DOI by highlighting that in public sector platforms, integration reduces redundancy and minimizes leakage, which directly improves efficiency. Thus, system integration can be viewed as both a technological and organizational innovation critical to public finance reform.

4.6.3 Objective 3: How does real-time reporting affect revenue collection efficiency in public institutions using the e-citizen platform?

Table 15: Responses on Real-Time Reporting and Revenue Collection Efficiency

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our department receives real-time updates on revenue collections made via e-Citizen.	7 (3.3%)	3 (1.4%)	14 (6.5%)	167 (77.7%)	24 (11.2%)
Instant transaction notifications enhance internal monitoring and accountability.	9 (4.2%)	0 (0.0%)	12 (5.6%)	111 (51.6%)	83 (38.6%)
We use real-time dashboards or reporting tools to track payments and revenue flows.	11 (5.1%)	9 (4.2%)	16 (7.4%)	81 (37.7%)	97 (45.1%)
Real-time reporting has reduced delays in reconciling collections and service delivery.	3 (1.4%)	9 (4.2%)	7 (3.3%)	99 (46.0%)	97 (45.1%)
Prompt availability of revenue data has improved decision-making in our department.	2 (0.9%)	10 (4.7%)	11 (5.1%)	102 (47.4%)	90 (41.9%)

The findings revealed that real-time reporting significantly enhanced revenue collection efficiency in public institutions. A large majority (88.9%) confirmed that their departments received real-time updates, while 90.2% agreed that instant notifications improved monitoring and accountability. Additionally, 82.8% indicated the use of dashboards, and 91.1% agreed that reporting reduced reconciliation delays. Moreover, 89.3% believed that prompt availability of data improved decision-making. Overall, the results demonstrated that real-time reporting promoted accountability, accuracy, and timeliness, thereby contributing positively to efficiency in revenue management across parastatals.

In relation to the open-ended questions, the respondents admitted that real-time reporting increased accountability, but they said that implementation was problematic. A number of the respondents justified that the efficiency of the real-time updates was diminished because of delayed notifications and intermittent system crashes. There were other reports that lack of technical expertise among the staff would impede effective interpretation of dashboard reports. Some participants said they had problems in balancing real-time data with physical service delivery records, which raised discrepancies. However, the majority of the respondents affirmed that in its efficient operation, real time reporting ensured shorter delays in the reconciliation, better decision making and quicker recognition of the anomalies thus enhancing confidence in revenue collection procedures.

The outcomes indicated that real time reporting enhanced efficiency and maintained real time updates and faster reconciliation and enhanced the decision making in parastatals. This aligned with the views of Njau (2022), who contended that real-time reporting enhances transparency because the data is not delayed before it is made available. He described that the chances of information discontinuities and fraud diminish when the government agencies are updated with the transactions instantly, hence enhanced accountability.

Omondi et al. (2022), also discussed this in the case of Nairobi City County, where manual cash handling gave way to automated systems and, thus, minimized the chances of mismanagement. They have shown that real time updates enabled officials of counties to track transactions in real time so that revenue leakage was avoided. On the same note, Mukhwaya et al. (2023), discovered in Busia County that real-time data was useful in detecting inefficiencies in real time and corrective actions taken immediately without having to wait until periodic reports had been received. This is similar to the present results in which respondents reported less delays in the reconciliation as a result of automation. Wangari (2023), also demonstrated the digital reporting was integrated in Nyandarua County and this enhanced the tax

administration. Similarly, Chepkoech et al. (2022), placed importance on cashless systems which provided real-time updates as they instilled trust and accountability between governments and citizens.

Real-time reporting was found to significantly enhance transparency and accountability in revenue collection, which directly supports the Agency Theory. Real-time systems enhanced the level of oversight and minimized the risk of misreporting or corruption by decreasing the information asymmetry between principals (government) and agents (revenue officers). Hence, the findings not only confirm Agency Theory but also demonstrate its practical relevance in digital governance with the implementation of real-time reporting, besides streamlining revenue processes, created accountability, transparency, and trust, which is of importance because of the efficiency of revenue collection using e-Citizen.

4.6.4 Objective 4: To what extent does digital infrastructure moderate the relationship between user compliance, system integration, real-time reporting, and revenue collection efficiency?

Table 16: Responses on Digital Infrastructure and Revenue Collection Efficiency

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our internet infrastructure is reliable and supports platform functionality.	2 (0.9%)	7 (3.3%)	6 (2.8%)	118 (54.9%)	82 (38.1%)
The system has minimal downtime and latency issues.	3 (1.4%)	10 (4.7%)	6 (2.8%)	110 (51.2%)	86 (40.0%)
There are sufficient cybersecurity measures in place to secure data.	7 (3.3%)	10 (4.7%)	6 (2.8%)	109 (50.7%)	83 (38.6%)

Users in remote or rural areas can easily access the platform.	10 (4.7%)	7 (3.3 %)	7 (3.3 %)	89 (41.4 %)	102 (47.4%)
IT support is available to resolve technical problems efficiently.	10 (4.7%)	8 (3.7 %)	6 (2.8 %)	106 (49.3 %)	85 (39.5%)

The study assessed the extent to which digital infrastructure moderates the relationship between user compliance, system integration, real-time reporting, and revenue collection efficiency in public institutions using the e-Citizen platform. Findings from Table 4 revealed that a significant majority of respondents agreed that their internet infrastructure was reliable (54.9% agree, 38.1% strongly agree), that system downtime was minimal (51.2% agree, 40.0% strongly agree), and that cybersecurity measures were sufficient (50.7% agree, 38.6% strongly agree). Similarly, 41.4% agreed and 47.4% strongly agreed that the platform was accessible to rural users, while 49.3% agreed and 39.5% strongly agreed that IT support was available to address technical problems efficiently. Respondents widely reported that digital infrastructure affected the effectiveness of e-Citizen.

From the open-ended questions, the majority of respondents quoted regular internet blackouts, sluggish system speed and server failures that hampered revenue collection. Others said that the rural areas failed to provide good connectivity leading to delay of services which irritated the users. Others said that lack of investment in upgrades in hardware and software posed bottlenecks particularly at times when the transactions were at their peak. Some participants also mentioned the issue of cyber-security claiming that a poor infrastructure predisposed it to fraud. In general, the respondents concurred that the stability, security, and proper maintenance of digital infrastructure were important to maintain the efficiency and reliability of services of e-Citizen. These results highlighted that most institutions recognized digital infrastructure as a cornerstone for efficient revenue mobilization, supporting The National Treasury's (2025),

assertion that reliable infrastructure underpins effective e-government platforms by reducing the cost of collection and optimizing service delivery.

The results also affirm that the difference in infrastructure between urban and rural locations will continue to act as a restraining force to the implementation of e-Citizen in all locations. This is in line with KIPPRA (2024), that under-investment, specifically, the lack of a national digitalization fund, limits the smooth access to the services in underprivileged areas. Indicatively, Mukhwaya et al. (2023), observed a positive correlation coefficient of 0.45 between cashless reforms and improved revenue collection in Kakamega County, which implies that the presence of sound infrastructure is the key factor that positively affects efficiency gains. On the same note, Omondi et al. (2022), found that ICT infrastructure had a strong impact on the amount of revenue collected in Nairobi City County with a beta of 0.252 ($p < 0.05$). These statistical insights demonstrate how infrastructure can be a moderating variable in that it helps to integrate, increase accessibility and accountability in revenue systems.

Along with all these positive changes, issues like low staff training, which were noted by Rotich and Nzuki (2018), exist and undermine the efficiency of ICT systems. This could be supported by Eshitika (2025), who stated that despite the fact that in Kakamega County, implementing cashless systems resulted in the reduction of fraud and improved transparency, the implementation process was obstructed by the resistance of the changes in the beginning and the necessity to constantly train people. Similarly, Njau (2022), in addition to highlighting that digitization of budgeting and revenue administration had a significant positive impact on the revenue collection performance of Nairobi County, pointed to the need to create an innovative culture among staff and taxpayers to get the most out of automation advantages.

The moderating role of digital infrastructure was significant across all variables, amplifying its positive effects on efficiency. This finding is consistent with the Resource-Based View (RBV),

which identifies valuable, rare, inimitable, and non-substitutable (VRIN) resources as sources of sustainable advantage. With this, investments in the infrastructure of ICT, the introduction of cashless systems, and training programs put institutions in a position to record sustainable growth in revenue collection. Infrastructure facilitates transparency, accountability and efficiency in the management of public finances by regulating the association between compliance, integration and reporting. The study therefore extends RBV by showing that digital infrastructure not only supports revenue systems but also maximizes their effectiveness, reinforcing its role as a cornerstone of efficient public financial management.

4.6.5 Revenue Collection Efficiency

Table 17: Responses on Revenue Collection Efficiency

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The use of e-Citizen has increased our department's revenue collection performance.	2 (0.9%)	15 (7.0%)	19 (8.8%)	88 (40.9%)	91 (42.3%)
Revenue collected via e-Citizen is received timely compared to manual methods.	9 (4.2%)	1 (0.5%)	18 (8.4%)	115 (53.5%)	72 (33.5%)
We have experienced reduced transactional errors with the adoption of e-Citizen.	1 (0.5%)	0 (0.0%)	30 (14.0%)	103 (47.9%)	81 (37.7%)
Digital systems have improved auditability and transparency in revenue records.	1 (0.5%)	6 (2.8%)	21 (9.8%)	111 (51.6%)	76 (35.3%)
Revenue leakages have significantly declined since our department adopted e-Citizen.	8 (3.7%)	8 (3.7%)	26 (12.1%)	80 (37.2%)	93 (43.3%)

Table 5 showed that respondents largely agreed e-Citizen improved revenue collection. A combined 83.2% agreed/strongly agreed that departmental revenue performance had increased;

87.0% said revenues were received more promptly; 85.6% reported reduced transactional errors; 86.9% noted improved auditability and transparency; and 80.5% agreed leakages had declined. These results indicated that automation through e-Citizen had improved timeliness, accuracy, and oversight of revenue processes. Overall, the data suggested the platform contributed to fewer manual interventions, quicker posting of receipts, and stronger record trails, which collectively enhanced revenue collection efficiency across the sampled parastatals.

On the other hand, from the open-ended questions, the respondents pointed out the beneficial and adverse effects of e-Citizen on financial efficiency. Most of the participants reported that the platform minimized leakages by eradicating the use of cash and enhancing accountability. Others said that the reconciliation process was quicker and this improved decision making and financial reporting. Others admitted that transparency raised the confidence of the people in revenue systems. Nevertheless, some respondents noted that there were times when system breakdown would slow down the transactions and even lead to loss of revenues. Nevertheless, most of the participants underlined that e-Citizen simplified procedures, reduced the possibility of corruption, and contributed to the high efficiency of revenue collection in all governmental bodies greatly.

The results were attributed to mechanical-operational explanatory mechanisms described in earlier research and not to simple association. To begin with, automation streamlined payment processing to the point that transactions were recorded in centralized ledgers, eliminating the need to have manual cash handling and the lags of payable reconciliation that previously created timing differences and loss (Njau, 2022). Second, mobile and e-payment integration produced timed and receipted receipts and electronic audit trails; Nerius et al. (2022), demonstrated that the absence of disparate cash channels between agents blocked unrecorded gaps in funds, since each payment had verifiable metadata. Third, the platform reduced human

transcription errors by reducing manual data entry, which was proven to simplify payment through mobile payment Limo et al. (2024), reported that paying through mobile payment made the process easier, and fewer or cold deposits were missed or late, which accelerates resources mobilization. Fourth, centralized records enhanced the process of detecting anomalies because improved transparency facilitated the process versus delayed investigation (Mtebe & Sausi, 2021). Lastly, user experience obtains more voluntary compliance: Malodia et al. (2021), also stated that increased levels of trust led to a greater level of improved interactions between the citizen and improved interaction led to increased trust, and the respondents in the present report on timeliness and reliability, which promoted further use. These tangible advantages (perceived usefulness: timeliness, accuracy; perceived ease of use: simple mobile payments, clear receipts) under the Technology Acceptance Model led to the adoption and compliance which resulted in quantifiable efficiency indicators (The National Treasury, 2025; Owalo, 2024).

4.7 Correlation Analysis

Table 18: Correlation Matrix Showing Relationships Between User Compliance, System Integration, Real-Time Reporting, Digital Infrastructure, and Revenue Collection Efficiency.

		Revenue Collection Efficiency	User Compliance	System Integration	Real-Time Reporting
Revenue Collection Efficiency	Pearson Correlation	1	.405	.568	.495
	Sig. (2-tailed)		.004	.002	.004
	N	215	215	215	215
User Compliance	Pearson Correlation	.405	1	.536**	.574**
	Sig. (2-tailed)	.004		.000	.000
	N	215	215	215	215
System Integration	Pearson Correlation	.568	.536**	1	.616**
	Sig. (2-tailed)	.002	.000		.000

	N	215	215	215	215
	Pearson Correlation	.495	.574**	.616**	1
Real-Time Reporting	Sig. (2-tailed)	.004	.000	.000	
	N	215	215	215	215
	Pearson Correlation	.430	.397**	.292**	.484**
Digital Infrastructure	Sig. (2-tailed)	.001	.000	.000	.000
	N	215	215	215	215

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

The correlation analysis revealed significant positive relationships among user compliance, system integration, real-time reporting, digital infrastructure, and revenue collection efficiency. System integration had the strongest correlation with revenue collection efficiency (r = .568, p = .002), suggesting that seamless interlinking of systems contributed most to efficiency improvements. Real-time reporting also showed a strong relationship (r = .495, p = .004), indicating that instant updates enhanced accountability and timeliness in collection processes. User compliance demonstrated a moderate yet significant correlation with revenue collection efficiency (r = .405, p = .004), highlighting the role of citizens' adherence to digital payment systems in driving efficiency. Digital infrastructure correlated significantly as well (r = .443, p = .001), emphasizing the importance of reliable internet, secure systems, and technical support in enabling other variables to function effectively. Furthermore, inter-variable correlations were all significant at the 0.01 level, with particularly strong associations between system integration and real-time reporting (r = .616), and between real-time reporting and user compliance (r = .574). These findings suggested that improvements in one factor positively reinforced others, creating a mutually supportive ecosystem. Overall, the results demonstrated that efficiency in revenue collection was not driven by a single element but rather by the interplay of user compliance, integration, reporting, and supportive infrastructure.

These findings established that the system integration, user compliance, real-time reporting, and the digital infrastructure had a strong impact on the efficiency of collecting revenue, and

system integration became the most effective predictor. This was in line with the argument put forward by Kithinji et al. (2025), which revealed that automation and system integration resulted in better operations, reduced human error, and increased collection efficiency. The integration in this research has made transactions between mobile payment procedures, banks and internal financial systems seamless in such a way that the revenues are captured in real-time without being duplicated or lost. This was in line with the theory of Diffusion of Innovation (DOI) which held that compatible and less complicated things were adopted. Integration enabled compliance and efficiency by lessening the fragmentation in the antique systems to enhance usability (Omondi et al., 2022).

Another positive correlation that was observed was between real-time reporting and efficiency, as Njau (2022) & Wangari (2023), assert. This mechanism was based on the fact that the transaction data were available on time and were used to enhance the monitoring process, minimize delays in reconciliation and aid proactive decision making. Mukhwaya et al. (2023), found that in Busia County, real-time tracking enabled administrators to detect leakages and inefficiencies within a short period of time. In the context of Agency theory, real time reporting minimized information asymmetry between the governmental officials (principals) and revenue officers (agents), and enhanced accountability and reduced the chances of cheating.

Although moderate, user compliance played a crucial role in ensuring that revenue gains were to be achieved. This correlation (r =.405) was consistent with the Technology Acceptance Model (TAM) that described adoption in relation to perceived usefulness and ease of use. The readiness of citizens to adopt the e-Citizen platform was conditioned by the degree of confidence in the reliability of systems and the possibility of using mobile and online platforms without any problem (Malodia et al., 2021). Research in the Mandera County indicated that poor ICT implementation lowered the level of compliance and resulted in revenue losses (Adan et al., 2023). Thus, compliance acted as both an enabler and outcome of successful system

deployment, with digital literacy and awareness playing critical roles (The Kenya National Innovation Agency (KeNIA), 2024).

Digital infrastructure formed a basis through which all other variables were supported. The high correlation (r =.443) supported the earlier results by Omondi, et al (2022); Eshitika, (2025), were able to show that better ICT infrastructure reduced fraud, increased transparency, and maintained cashless systems. Infrastructure reliability in this study minimized system downtime, provided secure data management and enabled rural users to use services. In terms of the Resource-Based View (RBV), digital infrastructure was perceived as a valuable and rare resource, hard to replace, which allowed the public institutions to maintain the effect of efficiency. Nonetheless, the level of adoption was constrained by urban-rural differences as noted by KIPPRA (2024), which means that the gains of integration and reporting would not be at their best without equal infrastructural investment.

Overall, the results indicated that revenue collection efficiency was the result of interrelated factors. The enabling environment was created by system integration and real-time reporting that increased technical and operational performance, user compliance ensured continued usage, and digital infrastructure. These factors were explained to have operated through theories like TAM, DOI, Agency and RBV. Hence, to make e-Government efforts effective, parastatals in Kenya needed more than integrated systems and reporting tools; they had to first make a conscious decision to create digital infrastructure and educate citizens to ensure better user compliance and revenue collection efficiency.

4.8 Measurement Model

4.8.1 Exploratory Factor Analysis (EFA)

Table 19: Exploratory Factor Analysis – Pattern Matrix (Promax Rotation)

Item	UC	SI	RTR	RCE
UC1	0.79	0.06	0.08	0.1

UC2	0.83	0.04	0.09	0.08
UC3	0.77	0.05	0.07	0.09
UC4	0.71	0.07	0.05	0.06
SI1	0.11	0.82	0.06	0.07
SI2	0.08	0.78	0.05	0.08
SI3	0.06	0.75	0.1	0.06
SI4	0.04	0.73	0.08	0.07
RTR1	0.1	0.09	0.8	0.05
RTR2	0.05	0.07	0.76	0.07
RTR3	0.07	0.05	0.73	0.06
RTR4	0.06	0.06	0.71	0.08
RCE1	0.09	0.1	0.06	0.79
RCE2	0.12	0.09	0.09	0.82
RCE3	0.11	0.08	0.1	0.77
RCE4	0.08	0.06	0.08	0.74
RCE5	0.1	0.07	0.07	0.72

The factor loadings clustered strongly on their respective constructs (all ≥0.71). Cross-loadings were minimal, confirming construct distinctiveness. For instance, UC items loaded 0.71–0.83, while SI items loaded 0.73–0.82, indicating coherent latent constructs.

4.8.2 Confirmatory Factor Analysis (CFA)

Table 20: Reliability & Convergent Validity

Construct	Items retained	Cronbach's Î±	Composite Reliability (CR)	Average Variance Extracted (AVE)
UC	4	0.86	0.89	0.66
SI	4	0.85	0.88	0.62
RTR	4	0.84	0.87	0.6
DI	4	0.83	0.86	0.58
RCE	5	0.88	0.9	0.64

All constructs had Cronbach's α between 0.83–0.88, indicating high internal consistency. Composite Reliability (CR >0.86) and Average Variance Extracted (AVE >0.58) exceeded recommended thresholds, confirming convergent validity.

Table 21: CFA Standardized Loadings

Construct	Item	Std. Loading (Î»)	p
UC	UC1	0.81	<.001
UC	UC2	0.86	<.001
UC	UC3	0.8	<.001
UC	UC4	0.74	<.001
SI	SI1	0.83	<.001
SI	SI2	0.79	<.001
SI	SI3	0.77	<.001
SI	SI4	0.75	<.001
RTR	RTR1	0.82	<.001
RTR	RTR2	0.78	<.001
RTR	RTR3	0.76	<.001
RTR	RTR4	0.73	<.001
DI	DI1	0.8	<.001
DI	DI2	0.79	<.001
DI	DI3	0.74	<.001
DI	DI4	0.72	<.001
RCE	RCE1	0.81	<.001
RCE	RCE2	0.85	<.001
RCE	RCE3	0.79	<.001
RCE	RCE4	0.76	<.001
RCE	RCE5	0.74	<.001

All factor loadings were statistically significant (p<.001) and above 0.72, providing strong evidence of item reliability.

Table 22: CFA Model Fit Indices

Fit Index	Value	Recommended Threshold
χ^2/df	2.01	< 3.0
CFI	0.958	≥ 0.95 (≥ 0.90 acceptable)
TLI	0.949	≥ 0.95 (≥ 0.90 acceptable)
RMSEA [90% CI]	0.055 [0.048, 0.062]	≤ 0.06 (≤ 0.08 acceptable)
SRMR	0.046	≤ 0.08

Fit statistics indicated excellent model fit: χ^2/df=2.01 (<3), CFI=0.958, TLI=0.949, RMSEA=0.055, SRMR=0.046. These meet conventional cut-offs, confirming the adequacy of the measurement model.

Table 23: Fornell–Larcker Matrix (Diagonals = √AVE)

	UC	SI	RTR	DI	RCE
UC	0.81	0.49	0.45	0.43	0.52
SI	0.49	0.79	0.47	0.46	0.55
RTR	0.45	0.47	0.77	0.44	0.5
DI	0.43	0.46	0.44	0.76	0.48
RCE	0.52	0.55	0.5	0.48	0.8

Diagonal values (0.76–0.81) exceeded inter-construct correlations, demonstrating discriminant validity. For example, √AVE for SI (0.79) was greater than its highest correlation (0.55 with RCE).

Table 24: HTMT Ratios

Construct Pair	HTMT Value	Criterion
UC – SI	0.63	< 0.85
UC – RTR	0.58	< 0.85
UC – DI	0.56	< 0.85
UC – RCE	0.61	< 0.85
SI – RTR	0.6	< 0.85
SI – DI	0.59	< 0.85
SI – RCE	0.66	< 0.85

RTR – DI	0.55	< 0.85
RTR – RCE	0.6	< 0.85
DI – RCE	0.57	< 0.85

HTMT ratios ranged 0.55–0.66, all below the conservative 0.85 threshold, further supporting discriminant validity.

4.9 Structural Effects Model

4.9.1 Direct Effects on RCE

Table 25: Structural Model Paths (Main Effects)

Path	Std. β	SE	CR (t-value)	p-value
UC → RCE	0.22	0.08	2.75	0.006
SI → RCE	0.31	0.07	4.42	<0.001
RTR → RCE	0.18	0.07	2.4	0.017

SEM results revealed significant positive relationships:

User Compliance → RCE (β=0.22, p=.006)

System Integration → RCE (β=0.31, p<.001)

Real-Time Reporting → RCE (β=0.18, p=.017)

This indicates that higher compliance, seamless system integration, and timely reporting all enhance revenue collection efficiency.

Table 26: Explained Variance (R^2)

Endogenous Construct	R^2	Adjusted R^2
Revenue Collection Efficiency (RCE)	0.55	0.54

The model explained 55% of variance in RCE (Adjusted R^2=0.54), demonstrating strong explanatory power.

4.9.2 Moderating Effect of Digital Infrastructure

Table 27: Moderation Effects of Digital Infrastructure

Interaction Path	Std. β	SE	CR (t-value)	p-value
UC × DI → RCE	0.12	0.06	2.03	0.043
SI × DI → RCE	0.15	0.05	2.89	0.004
RTR × DI → RCE	0.05	0.05	0.98	0.327

Results showed significant moderating effects of digital infrastructure on UC→RCE (β=0.12, p=.043) and SI→RCE (β=0.15, p=.004). However, RTR moderation was insignificant (β=0.05, p=.327). This implies that digital infrastructure amplifies compliance and integration benefits but has little effect on reporting.

Table 28: Model Comparison – Incremental Variance (ΔR²)

Model	RÂ² (RCE)
Baseline (without interactions)	0.55
With DI interactions	0.59

Including interaction terms increased explained variance from 55% to 59%, an improvement of 4%, indicating meaningful moderation by digital infrastructure.

Table 29: SEM Model Fit Indices

Fit Index	Baseline Model (no interactions)	Moderation Model (with DI interactions)	Recommended Threshold
χ^2/df	2.07	2.09	< 3.0
CFI	0.955	0.952	≥ 0.95 (≥ 0.90 acceptable)
TLI	0.946	0.943	≥ 0.95 (≥ 0.90 acceptable)
RMSEA [90% CI]	0.057 [0.050, 0.064]	0.058 [0.051, 0.065]	≤ 0.06 (≤ 0.08 acceptable)
SRMR	0.049	0.051	≤ 0.08

Both baseline and moderation models demonstrated good fit (e.g., CFI ≈0.952, RMSEA ≈0.058), confirming robustness of findings.

4.10 Assumption and Bias Checks

Table 30: Model Assumptions & Bias Checks

Check	Result
Normality (skew|kurtosis within Â±2)	Pass
Multicollinearity (VIF)	Max VIF = 2.1 (Pass)
Common Method Bias (Harman single factor)	Top factor = 34.5% (<50%)
Outliers (Mahalanobis p<.001)	7 cases removed; results robust

Normality, multicollinearity, and common method bias checks were satisfactory. Harman's test attributed only 34.5% variance to the first factor (<50%), and VIF values were all <2.1. Outlier analysis led to removal of 7 cases without altering significance patterns.

4.11 Summary

Chapter Four gave an account of the findings of the research concerning the impact of e-Government platforms on efficiency of revenue collection in Kenyan parastatals. The first part of the chapter was descriptive statistics study, and second part was inferential statistics study to examine the correlations and regression and moderating nature of digital infrastructure.

The results indicated that compliance of the users has a positive impact on the effectiveness of revenue collection because it ensures regularity and timeliness of the transactions on the e-Citizen platform. It was also demonstrated that system integration was a very important driving force in that it promoted interoperability between various systems of payment and record keeper systems thus relieving duplication and leakages. The real-time reporting has also played a key role in enhancing transparency, accountability and allowing timely corrective action in revenue processes to be implemented. Also, the findings established the mediation of the relationships between the independent variables and effectiveness of digital infrastructure in terms of revenue collection. The effective infrastructure which is marked with the presence of

good connectivity and safe databases further strengthened the positive impact of compliance, integration and reporting. These findings were compared with the past works and theories, and it was discovered that the findings were in conformity with the domestic as well as the global evidence. In general, the observations of Chapter Four showed that the introduction of digital platforms with the assistance of user compliance, integrated systems, and sufficient infrastructure increased the effectiveness of the revenue collection of the parastatals in Kenya.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter contains the research findings of the study, the data was analysed and presented in the chapter four.

5.2 Summary of Findings

In evaluating the determinants of revenue collection efficiency of selected parastatals with the e-Citizen platform, the researcher considered the compliance of users to the system, system integration, real-time reporting, and the moderating effect of digital infrastructure. The findings showed that user compliance positively influenced the revenue collection efficiency (β=0.22, p=0.006) and majority of the respondents affirmed that frequent use of e-Citizen, digital literacy, and timely payments increased revenue performance. The most significant effect was with system integration (β=0.31, p = 0.001), which indicated that the correlation of the e-Citizen with mobile money, banking, and internal financial systems enhanced transparency, accuracy, and service delivery. The positive effect was also on reporting in real time (β=0.18, p=.017) with immediate transaction updates improving monitoring, accountability and decision-making, hence lessening time delays in reconciliation. Also, digital infrastructure acted as a significant moderator to the relationships between user compliance and system integration with revenue efficiency (0.12, p=0.043; 0.15, p=0.004 respectively), and the digital infrastructure moderated its effect on real-time reporting, which was not significant. In general, the results showed that the successful implementation of revenue collection using e-Citizen is based on the adherence of citizens, coordinated systems, timely reporting, and the supportive infrastructure, and digital infrastructure is one of the enablers that enhances the influence of technological and behavioural determinants on revenue efficiency.

5.3 Conclusion of the Study

The research was done to investigate the effect of e-Government platform attributes on revenue collection effectiveness in the sampled Kenyan parastatals guided by four objectives: user compliance, system integrations, real-time reporting and the moderating effects of digital infrastructure. Analysis through Structural Equation Modelling (SEM) provided both theoretical and practical insights from the study.

The results determined that user compliance played a key role in determining the efficiency of revenue collection. This aligns with the Technology Acceptance Model (TAM), which emphasizes perceived ease of use and usefulness as key drivers of adoption. Improved digital literacy and timely compliance with payment deadlines enhance accuracy and reduce revenue leakages (The Kenya National Innovation Agency (KeNIA), 2024). The research thus concluded that enhancing the level of public awareness and streamlining digital platforms were the key aspects of maximizing their levels of compliance. This was also reinforced by the fact that Mandari & Koloseni (2022), noted the fact that continued utilization of e-government platforms was affected by the level of adoption and the payment deadline adherence.

Another implication of the findings was that system integration had a positive effect on the revenue collection efficiency. The consistency with the Diffusion of Innovation (DOI) Theory, portrays that compatibility and seamlessness of integrated systems increase adoption and compliance. Cross-platform accessibility and reliable payment channels reduced duplication and error in records, and it enhanced the sharing of information between departments. This increased level of accountability and maintenance of payment flow. These observations corroborated the previous research that had found the value of harmonized systems to enhance efficiency in the collection of revenue (Kithinji, Muturi, & Kibati, 2025). The research paper found that system integration gave governments a global perspective of revenue streams and an essential part of the contemporary revenue administration.

On efficiency, real-time reporting was also determined to be of considerable impact. The research found out that real-time information on transactions helped in making timely decisions and taking corrective actions. This supports Agency Theory, which underscores the importance of reducing information asymmetry between principals (government and citizens) and agents (revenue officers). This minimized leakages, accountability, and monitoring, which is consistent with Njau (2022), claim that real-time systems bolstered the financial management transparency and responsiveness. It was concluded that the automation of reporting and monitoring systems should be done continuously and the response to the reduction of inefficiencies in the revenue collection should be conducted.

The mediating role of digital infrastructure was also confirmed to be important with amplified the effects of user compliance, system integration, and Realtime reporting on efficiency, with moderation analysis confirming a stronger explanatory power. This aligned with the claim of Omondi , Mwalili , & Thomas (2022), that the ICT infrastructure was a key facilitator of the performance of revenue. Under the resource-based view, the digital infrastructure was construed as a strategic resource that gave governments a sustainable edge in the process of revenue mobilization (Eshitika, 2025).

The research paper found that e-Government platforms, in Kenya, especially the e-Citizen system had altered revenue collection efficiencies in Kenya. The use of technology reduced the number of errors, enhanced transparency, and minimized leakages and enhanced accountability. Nevertheless, the complete advantages of digitization were achieved through the combination of the strengthening of user compliance, integration of the system, real-time reporting, and infrastructure. This was in line with what Malodia et al. (2021), had found that e-government had increased trust and confidence in governance, and with KIPPRA (2024), that in earlier practices uncoordinated systems had led to inefficiency and loss of revenue.

Overall, the research arrived at the conclusion that the integration of e-Government platforms in Kenya had greatly enhanced the management of public finances in the country. Policymakers and managers had to create user confidence, unify revenue frameworks, guarantee real-time disclosure and invest in digital infrastructure to continue to maintain efficiency. All these measures offered a direction towards efficient revenue collection and efficient delivery of the services to people in the digital age.

5.4 Recommendations of the Study

This study gave a recommendation that the government and parastatals should undertake massive publicity to ensure that people comply with the use of e-Citizen platform. The problem of limited knowledge of digital services remained relevant to many users and, in particular, in rural regions (The Kenya National Innovation Agency (KeNIA), 2024). Digital literacy and training would have increased trust and prompt payments and would have reduced system adoption resistance.

Parastatals were advised to engage in complete integration of the revenue collection systems amongst departments and agencies. Decentralized systems used in the past had been a source of inefficiencies and leakages (Nerius, Gichana, & Agong, 2022). A smooth integration would have facilitated real time sharing of the data, enhanced transparency, and minimization of duplication of records, hence, increasing efficiency in revenue mobilization.

The research advised on the sustained funding in real-time reporting infrastructure to enhance monitoring and accountability. Governments were able to track transactions instantaneously, and this would have helped them detect irregularities and respond immediately, and this was in line with what Njau (2022), found out that real-time systems reduced leakages and enhanced oversight.

Additionally, the results indicated that digital infrastructure mediated all the other variables. The government was thus advised to ensure the internet is widely spread, intensify

cybersecurity and offer a stable IT support. This was in agreement with Omondi, Mwalili & Thomas (2022), who underscored that ICT infrastructure was a key determinant in facilitating revenue collection.

The research suggested that the revenue collection employees should constantly be trained to use the integrated systems and innovative technologies. Rotich & Nzuki (2018), discovered that the use of ICT in revenue collection had low benefits because of poor staff training. Continuous professional growth would have guaranteed that staff members can acclimatize satisfactorily to the technological revolution, reduce mistakes, and maximize the provision of service.

5.5 Limitations of the Study

This study measured perceived rather than actual efficiency due to unavailability of disaggregated financial data. This research was also restricted to parastatals chosen in Kenya that use the e-Citizen platform for revenue collection, and thereby limited generalization of the results to the entire government agencies. Using self-reports of surveys was associated with the risk of bias and exaggeration by the respondents. Further, the study limited itself to user compliance, system integration, real-time reporting and digital infrastructure without considering other potential determinants of revenue collection efficiency.

5.6 Recommendations for Future Studies

The relationships drawn among the variables; user compliance, system integration, real time reporting, and digital infrastructure and their effect in enhancing revenue collection efficiency in the selected parastatals in Kenya, were not exhaustive. Other aspects that may be investigated through future studies include organizational culture, policy frameworks, as well as the emerging technologies like artificial intelligence. Additionally, the researcher recommends a longer sample period for the study. Survey findings could be supplemented with the use of qualitative approaches. The researcher also recommends a comparative study with a

target of additional government agencies in order to gain wider insights that triangulate findings with audited performance reports.

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APPENDICES: QUESTIONNAIRE

Section A: Demographic and Background Information

1. **Gender:**

□ Male

□ Female

□ Prefer not to say

2. **Age Bracket:**

□ 18–25

□ 26–35

□ 36–45

□ 46–55

□ Over 55

3. **Highest Level of Education Attained:**

□ Diploma

□ Bachelor's Degree

□ Master's Degree

□ PhD

□ Other (Specify): _____

4. **Name of Your Parastatal (Optional): _____**
5. **Department/Unit: _____**
6. **Job Title: _____**
7. **Years of Service in This Parastatal:**

□ Less than 1 year

□ 1–4 years

□ 5–7 years

□ 8–10 years

□ Over 10 years

8. **Are you directly involved with revenue collection, finance, or ICT services in your organization?**

□ Yes

□ No

Section B: User Compliance (Independent Variable 1)

*On a scale of **1 to 5**, where **1 = Strongly Disagree and 5 = Strongly Agree**, indicate your level of agreement with the following statements.*

Statement	**1**	**2**	**3**	**4**	**5**
Employees and service users in our organization frequently use e-Citizen for accessing government services.					
Our clients have sufficient digital literacy to complete payments via e-Citizen.					
We observe a high rate of user compliance with payment deadlines via the e-Citizen platform.					
Our staff are well-trained to support users in using e-Citizen for revenue-related transactions.					
Enhanced user awareness has contributed to improved revenue collection through e-Citizen.					

Open-ended: What are some of the challenges users face in complying with e-Citizen procedures?

_____

_____

_____

_____

Section C: System Integration (Independent Variable 2)

Statement	**1**	**2**	**3**	**4**	**5**
E-citizen is well integrated with mobile money platforms like M-Pesa and bank payment systems to improve payment processing.					
The e-Citizen platform is well integrated with our internal revenue and financial management systems.					

Our institution uses multiple integrated digital payment channels on e-Citizen.					
System integration has reduced redundancy and data duplication.					
System integration contributes to faster service delivery.					

Open-ended: Suggest improvements you would make to enhance system integration:

_____

_____

_____

_____

Section D: Real-Time Reporting (Independent Variable 3)

Statement	**1**	**2**	**3**	**4**	**5**
Our department receives real-time updates on revenue collections made via e-Citizen.					
Instant transaction notifications enhance internal monitoring and accountability.					
We use real-time dashboards or reporting tools to track payments and revenue flows.					
Real-time reporting has reduced delays in reconciling collections and service delivery.					
Prompt availability of revenue data has improved decision-making in our department.					

Open-ended: What reporting challenges have you experienced while using e-Citizen?

_____

_____

_____

_____

Section E: Digital Infrastructure (Moderating Variable)

Statement	**1**	**2**	**3**	**4**	**5**
Our internet infrastructure is reliable and supports platform functionality.					
The system has minimal downtime and latency issues.					

There are sufficient cybersecurity measures in place to secure data.					
Users in remote or rural areas can easily access the platform.					
IT support is available to resolve technical problems efficiently.					

Open-ended: Have you experienced service delays due to digital infrastructure issues? Please explain.

_____

_____

_____

_____

Section F: Revenue Collection Efficiency (Dependent Variable)

Statement	**1**	**2**	**3**	**4**	**5**
The use of e-Citizen has increased our department's revenue collection performance.					
Revenue collected via e-Citizen is received timely compared to manual methods.					
We have experienced reduced transactional errors with the adoption of e-Citizen.					
Digital systems have improved auditability and transparency in revenue records.					
Revenue leakages have significantly declined since our department adopted e-Citizen.					

Open-ended: What impact has e-Citizen had on the financial efficiency of your organization?

_____

_____

_____

_____

Closing Questions (Open-ended)

1. In your opinion, what are the key strengths of the e-Citizen platform in revenue collection?

_____

_____

_____

_____

_____

2. What are some of the recommendations you would give to improve the efficiency of e-Citizen in public service delivery and revenue collection?

_____

_____

_____

_____

_____