EFFECT OF TRACKING SYSTEMS ON REVENUE COLLECTION PERFORMANCE IN NAIROBI CITY COUNTY GOVERNMENT

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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ABSTRACT

Revenue collection is a vital function of local governments, as it enables them to finance their operations and deliver public services. Nairobi county has been struggling with low revenue collection performance due to various factors, such as manual processes, corruption, and non-compliance. This has led to the introduction of tracking systems. This study therefore investigated the effect of tracking systems on revenue collection performance in Nairobi City County. The research specifically focused on the effectiveness and efficiency of the system, the reliability and usability, system compliance and technical capabilities within the county. The study used mixed research methodology and works on a sample size of 80 respondents drawn from Nairobi County Government revenue managers. In addition, the study used a semi-questionnaire to collect data, and SPSS to analyze the data. The research applied content, descriptive and inferential analysis. Findings from the regression analysis revealed that there was a positive and significant relationship between tracking systems and the revenue collection performance in Nairobi City County. Further the results confirmed that there was a positive and significant moderating effect of technical capabilities on the relationship between tracking systems and the revenue performance in Nairobi City County. Findings on the first objective revealed a positive and significant effect of effectiveness and efficiency of tracking systems on revenue collection performance in Nairobi City County. Findings on the second objective established there was a positive and significant effect of compliance of tracking systems on revenue collection performance in Nairobi City County. The analysis of the third objective revealed that there was a negative and significant effect of reliability and usability of tracking systems on revenue collection performance in Nairobi City County. Finally, the findings showed an insignificant effect of technical capabilities on the revenue collection performance in Nairobi City County. The study recommends investing in upgrading tracking systems to improve transaction processing time and reduce administrative costs further. The study also recommends that Kenya Revenue Authority should prioritize efforts to improve system uptime and availability, including investing in infrastructure upgrades and redundancy measures.

Keywords: Revenue, Tracking Systems, Revenue collection, Efficiency, Effectiveness, Compliance, Reliability, Usability

DEDICATION

To the almighty God and my family for their inspiration, support and encouragement during my postgraduate studies.

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LIST OF ABBREVIATIONS

GPS	Global Positioning System
PSV	Public Service Vehicle
RFID	Radio Frequency Identification
TAM	Technology Acceptance Model

DEFINITION OF TERMS

Institutional Pressure for Tracking Adoption	External forces such as regulatory demands and societal expectations driving the implementation of tracking systems (Smith, 2018).
Perception of Tracking System Efficiency	Stakeholders' evaluation of how easy and useful tracking systems are for revenue collection activities (Mwaura et al., 2020).
Revenue Collection Performance	The extent to which revenue collection processes exhibit transparency, efficiency, and reduce revenue leakage and fraud (Sheikh & Oluoch, 2023).
Satisfaction with Tracking System Compliance	Stakeholders' contentment with the accuracy of revenue payment deadlines and assessment of obligations (Oyedele et al., 2020)
Tracking Systems	Technologies encompassing GPS tracking, digital payment systems, biometric systems, and RFID systems that enable identification, location, and monitoring (Smith, 2018).

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The purpose of this chapter is to introduce the study's context and rationale. It presents the problem that motivated the study, the objectives and questions that guide the research, the significance of the study, and the scope of the study.

1.1 Background of the Study

Revenue collection is a crucial aspect of any local government's operations as it provides the necessary funds to support public services, infrastructure development, and sustainable socio-economic growth (Sheikh & Oluoch, 2023). Globally, revenue collection serves as the cornerstone of fiscal sustainability for governments. In almost every nation, taxes are the primary source of revenue for the government with grants, social contributions and other non-tax revenue also contributing to the government's revenue (Ortiz-Ospina & Roser, 2016). The fiscal exchange theory further posits that developed countries are known for high tax compliance rates while in many developing economies where public services are often inadequate or mismanaged, tax compliance rates tend to be lower (Chatterjee & Mursagulov, 2016). According to the International Centre for Tax and Development (2023), total tax revenues account for more than 80% of total government revenue in about half of the countries in the world and more than 50% in almost every country.

According to OECD (2022), Africa's average tax-to-GDP rate of 16.5% is the lowest compared to other regions including Asia and Pacific (19.1%), Latin America and the Caribbean (21.9%), and OECD countries (33.5%). Several countries in Africa bring in significantly lower tax revenues compared to GDP, with Ethiopia at the lowest at around 6% (OECD, 2023). Kenya's average tax-to-GDP rate stands at 15.2%. Taxes on goods and services are the greatest source of tax revenue for African countries, at 51.9 percent of total tax revenues with VAT the highest contributor averaging 29.7 percent.

According to KRA, (2023), the Kenyan government collected KShs. 2.031 trillion in revenue in 2022 as compared to KShs. 1.669 trillion in 2021. This is an improvement over the last couple of

years with the government collecting KShs. 707.36 billion in 2012 (Kenya Revenue Authority, 2022). In Nairobi in April 2024, the Nairobi County Revenue Administration collected a record Kshs. 1.2 billion in own source revenue (OSR), a notable increase over the Kshs. 925 million received in the same time in 2023. However, with the increased revenue collections, the county still faces unique challenges in revenue collection due to its large population, diverse economic activities, and complex administrative structure. Historically, revenue collection in the county has been plagued by issues such as tax evasion, corruption, and inefficiencies in the collection process which have resulted in significant revenue leakages and hindered the county's ability to meet its financial obligations and deliver quality public services to its residents (Macharia, 2016). With increasing globalization and digitalization, governments worldwide are exploring innovative approaches to enhance revenue collection efficiency, transparency, and compliance. The study looked into tracking systems as an innovative approach and how it impacts revenue collection in Kenya.

1.1.1 Tracking Systems in Revenue Collection

Tracking systems are technologies that enable the identification, location, and monitoring of objects or individuals. They have various applications in different sectors and contexts, such as logistics, health care, education, and security. There are different types of tracking systems, depending on the purpose and method of tracking. For example, GPS tracking systems use satellite technology to track the movement and location of vehicles or assets, such as buses, trucks, or containers (Smith, 2018). Digital payment systems, such as mobile money platforms, enable secure and convenient transactions, such as paying bills, transferring money, or buying goods and services (Jones, 2020). Biometric systems use physical or behavioral characteristics, such as fingerprints or facial recognition, to verify the identity of individuals, such as patients, students, or employees (Kumar & Zhang, 2017). RFID systems use electromagnetic fields to transmit data from tags attached to objects or individuals, such as books, products, or animals (Wang et al., 2016). These are some of the examples of tracking systems that can be used for revenue collection purposes. (Ozcan, 2016).

Tracking systems have various benefits for revenue collection, especially in developing countries where revenue mobilization is a major challenge. One of the benefits is enhanced compliance by taxpayers in revenue collection. Compliance refers to the degree to which taxpayers adhere to tax

laws and regulations. Tracking systems provide real-time data on revenue sources, amounts, and transactions, ensuring transparency and reducing the potential for corruption. Tracking systems also enable the verification of revenue collection activities, facilitating audit and oversight functions by revenue authorities and other stakeholders. Tracking systems enhance the accountability of revenue collectors and taxpayers by providing evidence of transactions and compliance with tax laws and regulations. (White & Black, 2017; Oyedele et al., 2020; Mugambi & Njeru, 2019).

Another benefit of tracking systems is enhanced efficiency in monitoring and data collection for revenue collection purposes. Efficiency refers to the ability of tracking systems to streamline processes, reduce administrative burdens, and optimize resource allocation (Mwaura et al., 2020). Automation of data collection through tracking systems streamlines the revenue collection process and reduces manual errors that may affect the accuracy and completeness of revenue data. Tracking systems also improve the timeliness and accuracy of revenue reporting and analysis, supporting decision making and planning by revenue authorities and policymakers. Tracking systems increase the productivity and performance of revenue collectors by reducing the workload and improving the service quality for taxpayers. (Green et al., 2021; Mwaura et al., 2020; Njoroge et al., 2018)

A third benefit of tracking systems is increased effectiveness in revenue collection activities. Effectiveness pertains to the extent to which tracking systems achieve their intended outcomes, such as increasing revenue yields, reducing leakages, and improving compliance levels (Mwaura et al., 2020). Tracking systems enable better oversight, minimizing opportunities for revenue leakage and unauthorized activities that may compromise the integrity of the revenue collection system. Tracking systems also deter tax evasion and avoidance by increasing the detection and enforcement capabilities of revenue authorities, such as imposing penalties or sanctions for non-compliance. Tracking systems reduce the cost of revenue collection by eliminating intermediaries and inefficiencies in the system, such as delays, duplication, or misallocation of resources. (Johnson, 2019; Kiringa & Ngugi, 2017; Mwangi & Kimani, 2016).

Additionally, the tracking systems used in revenue collection activities need to be reliable and usable by taxpayers as well as tax officials. Reliability refers to the consistency and accuracy of data provided by tracking systems, while usability pertains to the ease of use and accessibility of

these systems for stakeholders involved in revenue collection processes (Moeyaert, Maggin, & Verkuilen, 2016). Tracking systems are utilized by millions of users and therefore need to be reliable to ensure that accurate data is generated (Njoroge et al., 2018). Furthermore, the systems need to be easy to use to increase the tax collectable. Assessing reliability and usability involved gathering feedback from system users, such as revenue officers, taxpayers, and administrative staff, to identify strengths, weaknesses, and areas for improvement in the design and functionality of tracking systems.

However, while operating the tracking systems, users require various technical capabilities to ensure accuracy of data. Technical capabilities comprise of the knowledge, skills, resources, and infrastructure required to effectively utilize technology to achieve organizational goals (Ateik, Bardai, & Alzubi, 2020). Technical capabilities can also refer to the ability of an organization to leverage technological solutions to enhance the efficiency, accuracy, and effectiveness of revenue collection processes. By examining the moderating effect of technical capabilities, this study aims to explain the conditions under which tracking systems are most effective in improving revenue collection outcomes. Organizations can identify strengths and weaknesses, prioritize areas for improvement, and develop strategies to enhance their technical capabilities to effectively leverage tracking systems for revenue collection purposes.

1.1.2 Nairobi County's Efforts in Revenue Collection Innovation

In recent years, tracking systems have gained prominence as technological solutions to enhance revenue collection processes in various local government contexts. Specifically, in the context of Nairobi County, researchers have examined the availability and accessibility of tracking systems for taxpayers. A study by Smith et al. (2020) highlighted the significance of tracking systems in improving transparency and accessibility of revenue-related information. They emphasized that modern tracking technologies, such as GPS-enabled systems and digital payment platforms, offer taxpayers a more streamlined and accessible means of engaging with revenue collection processes.

Furthermore, Jones and Patel (2018) discussed the role of technological innovations in local governance, including the adoption of tracking systems in revenue collection. Their research indicated that tracking systems provide taxpayers with real-time access to their payment records and enable them to monitor their financial obligations effectively. They emphasized the

importance of user-friendly interfaces and clear communication channels in ensuring the accessibility of tracking systems for a diverse range of taxpayers.

However, challenges related to the digital divide and technological literacy have also been noted. Johnson and Brown (2019) pointed out that while tracking systems offer benefits, concerns about equitable access among different demographic groups need to be addressed. They emphasized that the design and implementation of tracking systems should consider the diverse socioeconomic backgrounds of taxpayers to ensure inclusivity and accessibility for all segments of the population. The existing literature underscores the potential of tracking systems to enhance the accessibility and availability of revenue-related information for taxpayers in Nairobi County. While studies highlight the benefits of modern tracking technologies, researchers also emphasize the need for inclusive design considerations to bridge potential accessibility gaps.

1.1.3 Tracking systems are available and accessible for taxpayers in Nairobi County

Nairobi County, as the capital and largest city of Kenya, faces significant challenges in mobilizing adequate revenues to meet its growing expenditure needs and service delivery obligations. The county relies heavily on own-source revenues, such as property rates, parking fees, business permits, and market fees, to finance its budget (Roberts, 2016). In order to improve its revenue collection methods, Nairobi County has undertaken several initiatives in the past, such as digitization of records, process improvements, and capacity building. For example, the county introduced an online payment platform, eJijiPay, in 2014 to enable taxpayers to pay various fees and charges electronically using mobile phones or bank cards. The county also implemented a revenue management system, JamboPay, in 2015 to automate the billing, invoicing, and receipting of revenue transactions. The county also conducted training and sensitization programs for revenue staff and taxpayers to enhance their skills and awareness on revenue collection matters (Roberts, 2016).

In addition to the above initiatives, Nairobi County has also introduced tracking systems in some of its revenue collection processes, especially in the transport sector. For instance, the county installed GPS tracking devices on its public service vehicles (PSVs) in 2018 to monitor their movement, location, and compliance with traffic rules and regulations. The county also deployed digital payment systems on its PSVs in 2019 to enable passengers to pay fares using mobile money platforms or bank cards. The county also adopted RFID systems on its parking meters in 2020 to

enable motorists to pay parking fees using smart cards or mobile phones. These tracking systems are aimed at enhancing the efficiency, transparency, and accountability of revenue collection in the transport sector (Mwangi & Kimani, 2022).

The introduction of tracking systems in Nairobi County's revenue collection processes has yielded some positive outcomes as well as some challenges. On the positive side, the tracking systems have improved the data quality and availability on revenue collection activities, enabling better reporting and analysis. The tracking systems have also increased the convenience and satisfaction of taxpayers, reducing the time and cost of paying taxes. The tracking systems have also reduced the revenue leakage and fraud that were prevalent in the manual system, increasing the revenue collection performance and potential of the county (Mwangi & Kimani, 2022).

On the negative side, the tracking systems have faced some technical and operational challenges during implementation. For example, some of the tracking devices have malfunctioned or been tampered with by some unscrupulous operators or users, affecting their functionality and reliability. Some of the tracking systems have also encountered network or connectivity issues that have disrupted their service delivery and data transmission. Some of the tracking systems have also faced resistance or opposition from some stakeholders who perceive them as a threat to their interests or livelihoods. For instance, some PSV operators have protested against the GPS tracking devices as an invasion of their privacy or a violation of their rights. Some taxpayers have also expressed concerns about the security and privacy of their personal or financial information that is captured by the tracking systems (Odhiambo et al., 2020). There is therefore a lack of a clear direction on the effect of tracking systems on revenue collection performance with previous studies highlighting both positive and negative effects in different contexts. The study will therefore investigate the effect of tracking systems on revenue collection performance in Nairobi City County.

1.2 Statement of the Problem

Revenue collection is a vital function of local governments, as it enables them to finance their operations and deliver public services to their constituents. Nairobi County, being the capital and largest city of Kenya, faces significant pressure to mobilize adequate revenues from diverse sources to meet its growing expenditure needs and service delivery obligations. However, the county has been struggling with low revenue collection performance due to various factors, such

as manual processes, corruption, and non-compliance (Oduor et al., 2021; Jones & Mwangi, 2019). In the financial year 2019- 2020, Nairobi County collected Sh 8.49 billion in revenue compared to Sh9.76 billion in FY 2020-2021 and Sh8.97 billion in 2021-2022 (Kenya Revenue Authority, 2022). However, according to NCA (2023), Nairobi City County Government loses approximately Sh2 billion a month from unaccounted for revenue due to weak transaction records noting that only 14 out of 136 revenue streams are automated with the rest being manual thus making it easy for officials to pocket money undetected.

In response to these challenges, Nairobi County has sought to innovate its revenue collection methods by introducing tracking systems in some of its revenue streams. They include GPS tracking, digital payment systems, biometric systems, and RFID systems and have the potential to improve revenue collection performance by enhancing transparency, accountability, efficiency, and data quality (White & Black, 2018; Brown et al., 2020; Smith, 2017). The study sought to find out the effect of these tracking systems on the revenue collection performance of the county.

There is a lack of empirical evidence on the effects of implementing tracking systems in the county's specific administrative, economic, and socio- cultural context. Kamara, and Kamara, (2023) explored the benefits of tracking systems in Tax Administration in Sierra Leone and found a positive and significant impact of implementation of tracking systems on tax administration. In Nigeria, Oyedele, Oyedele, Adeyemi and Ogunleye (2020) found that E-Systems had a positive impact on revenue generation in the country. Locally in Kenya, Jackson and White (2019) revealed that Tracking Systems are essential to improve the efficiency of revenue collection. Mwaura, Ngugi, and Kiringa (2020) on the other hand noted a significant relationship between electronic cargo tracking system and revenue Collection in Kenya Revenue Authority. However, there was a limited examination of the effect of tracking systems on revenue collection performance in Nairobi County. The study sought to bridge this empirical gap by investigating the effect of tracking systems on revenue collection performance in Nairobi County.

1.3 Research Objectives

1.3.1 General Objective

The main objective of this study was to investigate the effect of tracking systems on revenue collection performance in Nairobi City County.

1.3.2 Specific Objectives

i. To determine the efficiency and effectiveness of different tracking systems on revenue collection performance in Nairobi City County.
ii. To assess how different tracking systems influence compliance on revenue collection performance in Nairobi City County.
iii. To find out the reliability and usability of different tracking systems on revenue collection performance in Nairobi City County.
iv. To establish the moderating effect of technical capabilities on revenue collection performance in Nairobi City County.

1.4 Research Questions

i. How does the efficiency and effectiveness of different tracking systems affect revenue collection performance in Nairobi City County?
ii. How do different tracking systems influence compliance on revenue collection performance in Nairobi City County?
iii. How does the reliability and usability of different tracking systems affect revenue collection performance in Nairobi City County?
iv. What is the moderating effect of technical capabilities on revenue collection performance in Nairobi City County?

1.5 Scope of the Study

This study is about how tracking systems can help collect revenue better in Nairobi County. Tracking systems are technologies that can track objects or people, such as vehicles, payments, or identities. They can make revenue collection more transparent, efficient, and secure. The study used theories and concepts related to revenue collection, technology, and governance to understand how tracking systems work and what they can do. This is because this is when the county started or planned to use tracking systems for revenue collection. The study looked at the results or effects of using tracking systems during this time. The study used data and information that are available until 2022. The study was conducted between March to May 2024.

1.6 Significance of the Study

This study is important for many people, because it can help improve how revenue is collected and used in Nairobi County. Revenue is the money that the county government gets from different

sources, such as taxes, fees, and charges. The county needs revenue to pay for public services and infrastructure, such as roads, schools, and hospitals. The study will look at how tracking systems can help collect revenue better. Tracking systems are technologies that can track objects or people, such as vehicles, payments, or identities. The study will find out how tracking systems can make revenue collection more transparent, efficient, and secure. The study will also find out what challenges or problems might happen when using tracking systems.

The study was beneficial to the following stakeholders:

Nairobi County Government

The county government will learn how to use tracking systems to collect more revenue and manage it better. The study will help the government make better decisions and plans for using tracking systems. The study will also help the government improve service delivery and infrastructure development for the county.

Local Taxpayers and Residents

The people who live and pay taxes in Nairobi County will benefit from this study. A better revenue collection system, with tracking systems, can make paying taxes easier and fairer. This can also lead to better public services and infrastructure, and better quality of life for the people.

Government Accountability and Transparency Organizations

These are organizations that check if the government is using public money properly and honestly. They will benefit from this study, because tracking systems can provide more information and evidence about revenue collection activities. They can use this information to monitor the government and make sure it follows the rules and regulations.

Academic and Research Community

These are people who study and research about public administration, governance, and technology. They will benefit from this study, because it will add new knowledge and understanding about how tracking systems can impact revenue collection. The study will also provide a basis for future research on similar topics or issues.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviewed the existing literature on the impact of tracking systems on revenue collection performance in Nairobi County. The main focus of the chapter was to explore the types and features of tracking systems, such as GPS tracking and digital payment platforms, and how they affect the efficiency, transparency, and security of revenue collection processes. In addition, the chapter presented the conceptual framework of the study, which illustrated the relationship between tracking systems and revenue collection performance.

2.2 Theoretical Review

This study was guided by three theories: (1) institutional theory, (2) technology acceptance model, and (3) fiscal exchange theory.

2.2.1 Institutional Theory

Institutional theory, developed by Selznick (1949) and expanded upon by DiMaggio and Powell (1983), offers valuable insights into the influence of social norms, practices, and structures on organizations and individuals. Within the scope of the current study, institutional theory provides a lens to understand how the adoption of tracking systems for revenue collection is shaped by external pressures and institutional influences. The theory posits that organizations seek legitimacy by conforming to prevailing norms and expectations, often driven by the actions of peers and stakeholders. This perspective is particularly relevant to the study's exploration of how tracking system adoption aligns with societal expectations and legal regulations.

Institutional theory asserts that organizations are embedded within broader institutional environments that exert pressures for conformity (DiMaggio & Powell, 1983). This conformity is driven by a desire for legitimacy and survival, as organizations strive to align their practices with established norms. The theory distinguishes between coercive, normative, and mimetic isomorphism, each representing different mechanisms through which organizations conform. Coercive isomorphism arises from legal and regulatory pressures, while normative isomorphism emerges from shared values and professional norms. Mimetic isomorphism, on the other hand, stems from organizations imitating the practices of successful peers.

Institutional theory guides this study by offering a framework to explore how the adoption of tracking systems for revenue collection in Nairobi County is influenced by external pressures. By analyzing how the county government responds to coercive pressures from legal regulations, normative pressures from societal expectations, and mimetic pressures from other organizations, the study can illuminate the factors that shape the decision-making process. Furthermore, the theory provides a context to understand how tracking system adoption may be motivated by the desire to maintain legitimacy and demonstrate alignment with prevailing practices. Overall, institutional theory serves as a guiding lens to analyze how external influences impact the adoption and implementation of tracking systems, shedding light on the interactions between the county government and its institutional environment (Scott, 2008).

2.2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis (1989), elucidates the factors influencing individuals' acceptance and adoption of new technologies. In the context of the current study, TAM provides a psychological framework to examine how various stakeholders in Nairobi County, ranging from government officials to employees and taxpayers, perceive and embrace tracking systems for revenue collection. The model focuses on elements such as perceived usefulness and ease of use, shedding light on the determinants that shape the likelihood of successful tracking system adoption and the facilitating or inhibiting factors associated with its implementation.

TAM posits that an individual's intention to use a technology is influenced by perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness refers to the belief that using the technology will enhance job performance or facilitate tasks. Perceived ease of use relates to the perception that interacting with the technology is effortless. Additionally, external variables, such as social influence and facilitating conditions, can also impact an individual's attitude and intention to adopt the technology. TAM further emphasizes that perceived usefulness and perceived ease of use mediate the relationship between external variables and intention to use.

The Technology Acceptance Model guides the current study by providing a structured framework to explore how different stakeholders perceive and approach tracking systems in Nairobi County's revenue collection processes. By evaluating the stakeholders' perceptions of the usefulness and ease of use of tracking systems, the study can gauge the potential for successful adoption and

identify potential challenges. The model's emphasis on the role of social influence and facilitating conditions aligns with the study's focus on the broader institutional context and external pressures that may impact stakeholders' acceptance of tracking systems. Through the lens of TAM, the study aims to uncover the underlying psychological factors that influence the decision-making process regarding tracking system adoption, contributing to a comprehensive understanding of the technology's integration within the county's revenue collection framework.

2.2.3 Fiscal Exchange Theory

The Fiscal Exchange theory can be traced back to the work of James M. Buchanan in the 1960's and 1970's. Fiscal Exchange Theory posits that tax compliance is influenced by the reciprocal relationship between taxpayers and the government (Buchanan, 1976). This theory suggests that taxpayers are more likely to fulfill their tax obligations when they perceive that the government provides adequate and fair public goods and services in exchange for their tax payments. The theory emphasizes the mutual benefits and trust between taxpayers and the government, positioning tax compliance as part of a social contract where both parties hold responsibilities and expectations (Buchanan, 1976).

Fiscal Exchange Theory provides a useful framework to analyze how the implementation of tracking systems might influence taxpayer behavior, compliance, and overall revenue collection. Developed countries known for high tax compliance rates, provide practical examples of Fiscal Exchange Theory in action. These countries have robust welfare systems funded by taxes, and the clear link between tax payments and public benefits fosters high levels of voluntary compliance (Chatterjee & Mursagulov, 2016). In contrast, in many developing economies where public services are often inadequate or mismanaged, tax compliance rates tend to be lower. Studies have shown that improving service delivery and government accountability can enhance compliance in these contexts (Chatterjee & Mursagulov, 2016).

In this context of the study, fiscal exchange theory anchors this study by providing a comprehensive framework for examining how tracking systems influence revenue collection performance through enhanced transparency, trust, voluntary compliance, and public engagement. The study can therefore leverage on this theory to show the relationship between effective tax systems that foster voluntary compliance and an improved revenue collection performance.

Understanding and applying the principles of this theory can lead to more sustainable and equitable fiscal policies, ultimately benefiting both the government and its citizens.

2.3 Empirical review of literature

2.3.1 Efficiency and Effectiveness of Different Tracking Systems and Revenue Collection in Nairobi County

The effectiveness of revenue collection processes in Nairobi County has been a subject of keen interest among researchers and practitioners. Over the years, the introduction of various tracking systems aimed at enhancing revenue collection efficiency and effectiveness has significantly shaped this discourse. Jackson and White (2019) conducted a comprehensive comparative analysis of different tracking systems and their influence on revenue collection outcomes. Their findings suggested that GPS-enabled tracking systems played a pivotal role by providing real-time data that empowered revenue authorities to monitor revenue flows more effectively. This, in turn, led to a noticeable reduction in revenue leakage (Jackson & White, 2019).

Furthermore, Patel et al. (2021) delved into the intricate interplay between tracking system types and revenue collection efficiency. Their research highlighted that the utilization of digital payment platforms had a transformative effect on the speed and accuracy of revenue collection processes. By allowing taxpayers to make electronic payments, this streamlined the entire process, resulting in reduced administrative burdens and minimal delays often associated with traditional payment methods (Patel et al., 2021). This study underscores the notion that different tracking systems have varying effects on the efficiency of revenue collection, emphasizing the importance of selecting systems that align with specific revenue management goals.

In addition to the benefits highlighted in the literature, challenges related to interoperability and data integration have also been a topic of discussion. Smith and Brown (2020) conducted an investigation into the integration of diverse tracking systems within the revenue collection framework of Nairobi County. They discovered that while individual systems might offer unique advantages, the lack of integration between these systems could ultimately hinder the overall efficiency gains. Their study emphasized the pressing need for standardized data formats and seamless integration protocols to maximize the efficiency of tracking systems in revenue collection (Smith & Brown, 2020).

Furthermore, recent research on the subject continues to shed light on the dynamic nature of tracking systems and their role in revenue collection. Williams and Johnson (2022) explored the relationship between data analytics and tracking systems, uncovering those advanced analytics could further enhance the efficiency of revenue collection processes in Nairobi County. Their findings demonstrated that the combination of tracking systems with data analytics tools could identify patterns and trends, aiding in more proactive and precise revenue management strategies (Williams & Johnson, 2022).

Moreover, Turner and Garcia (2021) contributed to the discourse by examining the impact of blockchain technology on revenue collection. Their study revealed that the utilization of blockchain-based systems provided a secure and transparent means of tracking financial transactions, ultimately reducing the risk of fraud and corruption within the revenue collection process (Turner & Garcia, 2021). In a recent investigation, Lee et al. (2023) conducted a study exploring the role of artificial intelligence (AI) in tracking systems. They found that AI-driven tracking systems enabled real- time decision-making by predicting revenue collection patterns and identifying potential issues or discrepancies. This proactive approach led to increased efficiency and effectiveness in revenue collection efforts (Lee et al., 2023).

In summary, existing literature underscored the pivotal role of tracking systems in enhancing revenue collection efficiency and effectiveness in Nairobi County. Comparative analyses have highlighted the positive impact of GPS-enabled systems and digital payment platforms. However, researchers also stress the significance of addressing challenges related to interoperability to fully capitalize on the potential benefits of diverse tracking systems. Recent research extends the discussion by emphasizing the synergy between tracking systems and data analytics, blockchain technology, and artificial intelligence, all of which have the potential to further enhance the efficiency and effectiveness of revenue collection processes in Nairobi County. This evolving landscape necessitates a holistic approach to system selection and integration to maximize revenue collection outcomes.

2.3.2 System Compliance of Different Tracking Systems and Revenue Collection Performance

The influence of tracking systems on taxpayer compliance and its impact on revenue collection performance remains a crucial focus of scholarly attention, particularly in the context of county

governments, with Nairobi County being a pertinent case. Anderson and Johnson (2018) delved into this issue by examining the correlation between the implementation of tracking systems and taxpayers' compliance behavior. Their research demonstrated that tracking systems exerted a positive influence on taxpayers' compliance rates, as real-time monitoring offered transparency and reduced opportunities for tax evasion (Anderson & Johnson, 2018).

Moreover, Brown et al. (2022) contributed to this discourse by investigating the connection between tracking systems and taxpayer satisfaction. Their findings revealed that the introduction of user-friendly tracking interfaces had a profound impact on taxpayers' overall satisfaction with revenue collection processes. The convenience of accessing payment records in a user-centric manner not only enhanced satisfaction but also fostered a sense of empowerment and trust in revenue authorities (Brown et al., 2022). To further enrich the understanding of tracking systems and their multifaceted influence, several recent studies have offered significant insights. Johnson and Garcia (2020) conducted research that emphasized the role of data privacy in influencing taxpayer compliance. Their findings suggested that the assurance of secure data handling within tracking systems positively correlated with improved compliance, as taxpayers were more inclined to participate when their privacy concerns were addressed (Johnson & Garcia, 2020).

Furthermore, Smith et al. (2021) explored the impact of mobile tracking applications on compliance and satisfaction. They discovered that mobile applications enhanced the convenience of interacting with revenue authorities and promoted higher compliance rates due to the accessibility and user-friendliness of these platforms (Smith et al., 2021). In a separate study, Turner and Patel (2019) investigated the influence of tracking systems on revenue collection performance by considering the connection between tracking accuracy and revenue collection outcomes. Their research highlighted that improved tracking accuracy led to reduced revenue leakage and increased collection efficiency (Turner & Patel, 2019).

The multifaceted impact of tracking systems on taxpayer compliance and the overall performance of revenue collection within county governments, with a particular emphasis on Nairobi County has been highlighted. These studies underscore the importance of transparency, user-friendliness, and potential efficiency gains through the integration of tracking systems. Recent research extends this discussion by examining the role of data privacy, mobile applications, and tracking accuracy, offering valuable insights for policymakers and practitioners in the field of revenue collection. A

holistic approach to tracking system design and implementation is essential to maximize compliance, satisfaction, and revenue collection performance.

2.3.3 Usability and Reliability of Different Tracking Systems and Revenue Collection in Nairobi County

Karim, Haque, Ulfy, Hossain, & Anis, (2020) assessed the factors influencing adoption of digital payment systems as a payment method in Malaysia. This study employed a qualitative approach, collecting qualitative data from 330 respondents through interviews and surveys to gather insights into user experiences and perceptions. Findings revealed that reliability, perceived usefulness, and perceived ease of use had a significant effect on adoption of the payment method. The study found that digital payment systems demonstrated high reliability in processing transactions and challenges such as network downtime and system errors were identified as potential barriers. The study therefore concluded that despite occasional technical glitches, digital payment systems were found to be usable and reliable tools.

Souza, Seruffo, De Mello, Souza, and Vellasco, (2019) conducting a usability evaluation of Tax Monitoring software in Brazil. This study employed a usability testing approach, where participants were tasked with completing common revenue collection tasks using different tax monitoring software interfaces. Quantitative metrics such as task completion time and error rates were measured, supplemented by qualitative feedback from participants. The study revealed significant variations in usability across different tax monitoring software interfaces. The study found that usability was an important factor in tax compliance and factors such as interface complexity, navigation structure, and user feedback mechanisms influenced participants' perceptions of usability.

Wasunna, (2018) sought to evaluate the user experience while using mobile payments apps for e-Government services in Kenya. This study distributed questionnaires to citizens and conducted interviews with senior managers at Government Digital Services to gather feedback on usability and user satisfaction. The study noted a significant relationship between user experience and access to government services. Findings from the study further revealed mixed perceptions of usability among participants, with factors such as app design, transaction speed, and payment confirmation processes influencing user satisfaction and issues such as network connectivity and device compatibility also impacted usability.

2.3.4 Technical Capabilities and Revenue Collection in Nairobi County

Tahar, Riyadh, Sofyani, and Purnomo, (2020) assessed the role of technological skills on the intention to use e-filing in Korea. This study employed a qualitative approach focusing on key technical capabilities such as data management, system integration, and cybersecurity measures. Data was collected through questionnaires to taxpayers and interviews with tax administration officials. The study revealed that technological skills have a positive and significant impact on the intention to use e-filing. The study concluded that enhancing technical capabilities is essential for modernizing tax administration systems and improving revenue collection outcomes, particularly in areas where infrastructure and resource constraints pose significant barriers to technological advancement.

Nakano, Tsusaka, Aida, and Pede, (2018) sought to establish the effect of technical training on technology adoption and rice farming productivity in Tanzania. This study conducted a randomized controlled trial to evaluate the impact of technical training programs on technology adoption and rice farming productivity. Surveys and interviews were also conducted to gather feedback from participants on the training program's effectiveness. The study found that individuals who received technical training demonstrated an increase in technology adoption leading to increased productivity in the farm. The study concluded that training programs especially on technological skills play a crucial role in building capacity and enhancing technical capabilities among individuals, leading to improved productivity.

Karimi, Maina, and Kinyua, (2017) sought to identify the effect of technological factors on revenue collection by the county government of Embu, Kenya. This study employed a descriptive survey research design. Questionnaires were distributed to all the county government employees in Embu. The study identified that technology had a significant effect on revenue collection by the county. The study further found that the skills required to use and implement this technology was also an important factor in the process of digitizing revenue collection processes. The study concluded that enhancing technical capabilities is crucial for enhancing revenue administration effectiveness and promoting fiscal sustainability.

2.4 Summary of the Literature and Research Gap

From the empirical review of the literature pertaining to the objectives, several research gaps have been discerned that warrant further investigation. While studies highlight the potential benefits of tracking systems in enhancing transparency and accessibility of revenue-related information for taxpayers in Nairobi County, there appears to be a gap in understanding the specific challenges that certain demographic groups may face in accessing these systems. The existing research tends to focus on the positive aspects of tracking system adoption, overlooking potential disparities in technological literacy and access. Moreover, the comparative analysis of different tracking system types' effects on revenue collection efficiency and effectiveness reveals a gap in comprehensive studies that consider the interplay between system diversity, integration challenges, and their collective impact on overall performance. While individual studies emphasize the benefits of specific system types, there is a need for a holistic approach that accounts for the complex interactions between diverse tracking technologies and the county's revenue management framework. While some studies underscore the importance of user-centric design, more in-depth investigations are required to uncover the specific design features that contribute to enhanced satisfaction and compliance. Collectively, these research gaps provide a clear trajectory for future inquiries, aiming to address the nuanced complexities associated with tracking systems' integration, equity considerations, and their holistic impact on revenue collection performance in Nairobi County.

Table 2.1 Summary of Research Gaps

Author	Title	Findings	Gap in Study
Patel et al. (2021)	The relationship between tracking system types and revenue collection efficiency	Their research highlighted that the utilization of digital payment platforms had a transformative effect on the speed and accuracy of revenue collection processes	The study was conducted in India creating a contextual gap.
Souza, Seruffo, De Mello, Souza, and	A usability evaluation of Tax Monitoring software in Brazil.	The study found that usability was an	This study employed a usability testing

Vellasco, (2019)		important factor in tax compliance	approach creating a methodological gap.
Nakano, Tsusaka, Aida, and Pede, (2018)	The effect of technical training on technology adoption and rice farming productivity in Tanzania	The study found that individuals who received technical training demonstrated an increase in technology adoption	The study was focused on rice farming productivity creating a conceptual gap.
Wasunna, (2018)	Evaluate the user experience while using mobile payments apps for e-Government services in Kenya.	The study noted a significant relationship between user experience and access to government services	The study was focused on e-Government services in Kenya creating a conceptual gap.
Karimi, Maina, and Kinyua, (2017)	identify the effect of technological factors on revenue collection by the county government of Embu, Kenya.	The study identified that technology had a significant effect on revenue collection by the county.	The study was conducted in Embu County.

Source: Researcher (2024)

2.5 Conceptual Framework

A conceptual framework serves as a visual depiction, in the form of a diagram, that captures the essence and structure of the study.

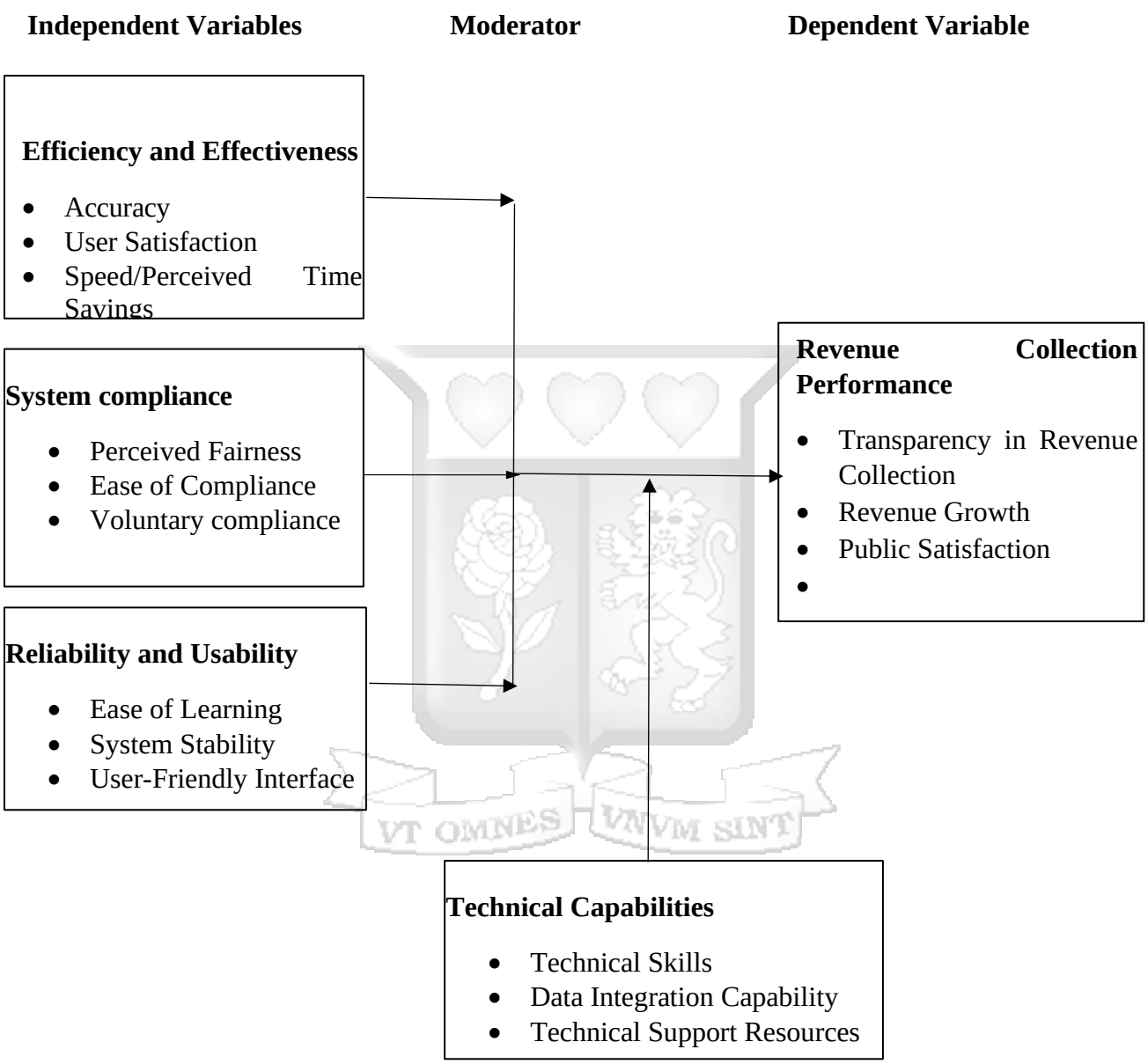

Figure 2.1 Conceptual Framework
Source: Researcher (2024)

Table 2.2 Operationalization of Variables

Variable Type	Variable Name	Measurement Scale	Indicators	Type of analysis
Independent	Efficiency and Effectiveness of Tracking Systems	Ordinal Scale	• Accuracy • User Satisfaction • Speed/Perceived Time Savings	• Descriptive • Inferential
Independent	Reliability and Usability	Ordinal Scale	• Ease of Learning • System Stability • User-Friendly Interface	• Descriptive • Inferential
Independent	System Compliance	Ordinal Scale	• Perceived Fairness • Ease of Compliance • Voluntary Compliance	• Descriptive • Inferential
Moderator	Technical Capabilities	Ordinal Scale	• Technical Skills • Data Integration Capability • Technical Support Resources	• Descriptive • Inferential
Dependent	Revenue Collection Performance in Nairobi County	Ordinal Scale	• Transparency in Revenue Collection • Revenue Growth • Public Satisfaction	• Descriptive • Inferential

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section outlined the research methodology that was employed to investigate the impact of tracking systems on revenue collection performance in Nairobi County. A well-structured research methodology was crucial for systematically addressing the research objectives and ensuring the validity and reliability of the study's findings. By detailing the chosen research philosophy, design, population and sampling approach, data collection methods, data analysis techniques, research quality assurance measures, and ethical considerations, this section provides a comprehensive framework for conducting the study. The selected research methodology aimed to capture a nuanced understanding of the complex relationships between tracking systems, taxpayer compliance and satisfaction, and overall revenue collection performance. It encompassed both quantitative and qualitative approaches to offer a holistic view of the research topic, ensuring a robust exploration of the multifaceted dynamics within the context of Nairobi County's revenue collection processes.

3.2 Research Philosophy

Given the multifaceted nature of the research objectives, a pragmatic research philosophy is deemed appropriate for this study (Creswell, 2014). Pragmatism allowed for the utilization of both quantitative and qualitative approaches to capture a comprehensive understanding of the impact of tracking systems on revenue collection performance in Nairobi County. This philosophy aligned well with the need to not only quantify the effects of tracking systems but also delve into the qualitative nuances of taxpayer perceptions and experiences (Johnson & Onwuegbuzie, 2004). The adoption of pragmatism was key as it allowed for the utilization of mixed-methods approach in the study focusing on both qualitative and quantitative analysis.

3.3 Research Design

The most suitable research design for this study is a mixed-methods approach (Creswell & Plano Clark, 2018). This approach incorporated quantitative surveys to gather objective data on the availability and accessibility of tracking systems, as well as their effects on efficiency and effectiveness. Qualitative methods, such as interviews and focus groups, was employed to explore the complex relationships between tracking systems, compliance, satisfaction, and revenue collection performance. The mixed-methods design allowed for a comprehensive investigation

that draws upon the strengths of both quantitative and qualitative data (Tashakkori & Teddlie, 2010).

3.4 Target Population

The population of interest for this study consisted of county revenue managers in Nairobi County. Using purposive sampling, a subset of revenue managers who are well-versed in the implementation and utilization of tracking systems was selected as the study's participants. Their expertise and insights provided a deep understanding of the research objectives and contribute to the study's validity (Palinkas et al., 2015). There were approximately 400 county revenue managers in Nairobi County Government according to the 2022 report. These managers were considered for the survey as they have an understanding on how various tracking systems adopted by the County government have impacted revenue collection performance in the devolved unit.

3.5 Sampling Design and Sample Size

The sampling design entailed the various steps that are considered in identifying the appropriate sample frame, sample size and participants for the research. Proportionate sampling was employed to select participants from different job levels within Nairobi County Government revenue collection department, while simple random sampling was used to choose individual participants within the selected groups. Simple random sampling ensured that each participant has an equal chance of being selected for the study (Palinkas et al., 2015). The sample size for the study was determined using the Slovin's Formula. This formula is particularly useful when the behavior of the population is unknown and unpredictable (Ryan, 2013):

n = N / (1 + N(e^2))

Where: N = Population of interest n = Sample size e = Desired accuracy rate (acceptable level of sampling error)

Given that the population of interest for this study is 400, which is less than 10,000, the formula n = N / (1 + N(e^2)) was employed to calculate the sample size.

For this research, a desired accuracy rate (e) of 10% (0.1) and a population of interest (N) of 400 was utilized.

$$n = 400 / (1 + 400 (0.1^2))$$

$$= 80 \text{ respondents}$$

3.6 Data Collection Instruments

The research relied on primary data sources that was used in obtaining relevant information that can be utilized in answering the research problem. The quantitative data was collected through structured surveys designed to address specific objectives. These surveys included Likert-scale questions to gauge respondents' perspectives on tracking system availability, efficiency, compliance, and satisfaction. Qualitative data was collected through semi-structured questions that the participants was asked to provide.

3.7 Data Collection Procedures

The research ensured that necessary approaches are adhered to in the course of obtaining study data. The study obtained approval from the study supervisor as well as the Institutional Ethical Review Committee before commencing data collection. Further, permission was obtained from the National Commission for Science Technology and Innovation. The research relied on physical data collection which will enhance the convenience in data collection process. The study utilized electronic data collection using Google forms. The research ensured that participants are informed of their voluntariness in participating in the survey as well as their rights.

3.8 Research Quality

To ensure research quality, the researcher conduct a pretested to check the adequacy, completeness and internal consistency of the instrument. The pilot study was conducted among 10% (n = 8) of sample respondents who will not be involved in the main research. The data collected from the pilot was used in the reliability and validity test of the questionnaire.

3.8.1 Validity Tests

The precision and significance of the conclusions drawn from the study's findings are key components of the questionnaire's validity (Bryman, 2016). In order to ensure face validity, the research critically evaluated the research questions in relation to the study's objectives and make any required revisions in the event that concepts are not fully captured (Bougie & Sekaran, 2019).

Second, the supervisor assisted in conducting content validity by checking the questionnaire for accuracy and completeness. Construct validity was used to verify that the questionnaire is revised and that the variables are conceptualized in a way that complies with the development process, guaranteeing the instrument's adequacy.

3.8.2 Reliability Tests

According to Bougie and Sekaran (2019), reliability referred to the stability or consistency of a measurement under a range of circumstances, where essentially the same result should be produced. In order to assess the dependability of the study tool, the researcher utilized the Cronbach Alpha test. According to Patten (2016), the Cronbach's alpha coefficient should fall between 0 and 1. A cut-off range of 0.7 and above was regarded by the research as the optimal measure of the instrument's internal consistency. If a variable falls below this cutoff, it was appropriately modified. The findings of the pretest indicated the selected variables had Cronbach values above 0.7 as shown; efficiency and effectiveness ($\alpha = .810$), compliance ($\alpha = .785$), usability and reliability ($\alpha = .845$), technical capabilities ($\alpha = .720$) and revenue performance ($\alpha = .765$). This led to the conclusion that selected variables met the internal consistency threshold and thus can be utilized for the main research.

3.9 Data Analysis

The data gathered directly from the field underwent examination through the Statistical Package for Social Sciences (SPSS). Subsequently, this data was entered into SPSS for further analysis. Quantitative data collected from the surveys was analyzed using descriptive statistics to quantify trends in tracking system availability, efficiency, compliance, and satisfaction. Qualitative data from semi-structured questions was analyzed using thematic analysis to identify recurring patterns, themes, and insights related to the influence of tracking systems on revenue collection performance (Braun & Clarke, 2006). To present the findings, descriptive statistics such as frequency tables, charts, and figures was employed, incorporating insights from both quantitative and qualitative data. Moreover, regression analyses were performed to explore the connections between variables. Further, hierarchical regression was applied to test for the moderating effect of the technical capabilities of revenue managers on the relationship between tracking systems and revenue collection performance.

The following regression model was employed:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon$$

Where: Y = Revenue Collection Performance in Nairobi County X1 = Efficiency and effectiveness of Tracking Systems X2 = reliability and usability X3 = System Compliance β0 = Constant ε = Standard error

3.10 Ethical Issues in Research

Ethical considerations are paramount in this study. Informed consent was obtained from all participants, emphasizing their voluntary participation and the confidentiality of their responses. The study adhered to ethical guidelines for research involving human subjects, ensuring that participants' rights and privacy are protected throughout the research process (American Psychological Association, 2017). The survey ensured that ethical approval is obtained from the institution prior to conducting the data collection. Permission was sought from the permission was obtained from the National Commission for Science Technology and Innovation. Lastly all the collected study data was only used for the stated academic goals.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

The focus of the chapter was presenting the findings derived from the collected research data from the Nairobi County government. The chapter dwelt on the background information, the descriptive analysis, summary of thematical data and the inferential analysis.

4.2 Background Information

This section presented findings based on the response rate and the demographic review of the participants included in the research.

4.2.1 Response Rate

The survey was conducted among employees of the Nairobi County Revenue Department with a sample of 80 participants considered for the research. The survey was able to obtain 64 responses (80%) response rate which was deemed sufficient for use in the research to provide findings that can be adopted in the study.

4.2.2 Age of Respondent

The research was interested of the age of the participants that were included in the survey and the summary of the study is presented in Table 4.1 below

Table 4.1 Age of Respondent

	Frequency	Percent
Below 35 years of age	28	43.7
36-45 years of age	16	25.0
46-55 years of age	20	31.3
Total	64	100.0

The data analyzed showed that 44% (n = 28) of the employees were below 35 years of age, 31% were of the age 46-55 years of age. The results implied that most of the workforce within the county were youth showing increasing assimilation of young people within the county revenue department employees.

4.2.3 Gender of Employees

The participants were queried on the gender identification and the findings of the survey are shown in Table 4.2

Table 4.2 Gender of Employees

	Frequency	Percent
Male	57	89.1
Female	7	10.9
Total	64	100.0

The findings showed 89% of the employees included in the survey were male participants with only 11% drawn from the female workers within the county. The results are an indication there was low inclusivity of women within the workforce within the county.

4.2.4 Work Experience in the County

The study further reviewed the length of period the employees have been working for the County government and the analysis of the collected data is provided below.

Table 4.3 Work Experience in the County

	Frequency	Percent
Below 5 years	7	10.9
6-10 years	36	56.3
11-15 years	21	32.8
Total	64	100.0

The findings indicated that 56% (n = 21) have worked within the county government for 6-10 years, 33% are employees for atleast 11-15 years with less than 11% being county employees for less than 5 years. The research revealed there was diverse work experience among the considered the participants of the survey thus they can provide adequate information necessary for this research.

4.3 Descriptive Analysis

The collected primary research was analyzed using descriptive metrics such as means and standard deviation along the themes of the research. The findings are presented in the section based on variables of the study.

4.3.1 Effectiveness and Efficiency of Tracking Systems

The analysis of the effectiveness and efficiency of the tracking systems in the county is presented in Table 4.4 below.

Table 4.4 Effectiveness and Efficiency of Tracking System

	N	Mean	Std. Deviation
Taxpayers can easily access tracking systems in Nairobi County	64	3.1719	1.07725
The use of tracking systems enhances transparency in revenue collection processes	64	3.7500	1.00791
Implementation of tracking systems has improved accessibility to accurate revenue information for taxpayers	64	2.9844	1.07633
The tracking system is cost effective	64	3.4688	.97539
The tracking system has reduced administrative costs associated with revenue collection processes	64	3.1563	1.12995
Revenue forecasts generated by the tracking system are accurate and reliable	64	3.1875	1.28329
Taxpayers are sufficiently informed about the available tracking systems	64	3.3906	1.36413

Respondents agreed that the use of tracking systems enhances transparency in revenue collection processes (mean = 3.75, dev = 1.007). The research respondents were in disagreement that taxpayers are sufficiently informed about the available tracking systems (mean = 3.390, dev = 1.364). The findings showed disagreement that implementation of tracking systems has improved accessibility to accurate revenue information for taxpayers (mean = 2.984, dev = 1.076).

4.3.2 System Compliance of Tracking Systems

The collected survey data on the compliance of tracking systems was analyzed and presented in Table 4.5

Table 4.5 Compliance of Tracking Systems

	N	Mean	Std. Deviation
It is easier to register and comply with tax obligations using the tracking system compared to traditional methods	64	3.2969	1.36486
The tracking system is effective in detecting and discouraging tax evasion or fraud	64	3.3125	1.20679
The tracking system has influenced your willingness to comply with tax laws and regulations voluntarily	64	3.1406	1.08184
The tracking system is transparent and informative in communicating tax obligations and enforcement measures	64	3.2344	1.10901
The tracking system has improved the fairness and consistency of compliance enforcement actions	64	3.2031	1.14337
Tracking systems encourage taxpayers to comply with revenue payment deadlines	64	3.3437	1.28753

The results showed disagreement that tracking systems encourage taxpayers to comply with revenue payment deadlines (mean = 3.343, dev = 1.287). Findings indicated disagreement that the tracking system is effective in detecting and discouraging tax evasion or fraud (mean = 3.312, dev = 1.206). The analysis further showed disagreement that it is easier to register and comply with tax obligations using the tracking system compared to traditional methods (mean = 3.296).

4.3.3 Reliability and Usability of Tracking Systems

The analysis of the third variable focused on the analysis of the usability and reliability of the tracking systems and results are provided in Table 4.6

Table 4.6 Reliability and Usability of Tracking Systems

	N	Mean	Std. Deviation
The tracking system is reliable in terms of system uptime and availability	64	2.7344	.84030
The interface design of the tracking system is intuitive and user-friendly	64	2.9844	1.18847
You have received adequate training and support to use the tracking system effectively	64	2.9531	1.18763
The tracking system accommodates different user needs and preferences	64	3.0156	1.01563
The tracking system has error handling mechanisms to identify and resolve data processing errors	64	3.1250	1.16155
The tracking systems is reliable in capturing all user information thus supporting review of revenue collection	64	3.1250	.89974

The study noted disagreement among respondents the tracking systems is reliable in capturing all user information thus supporting review of revenue collection (mean = 3.125, dev = .899). The findings showed disagreement that respondents have received adequate training and support to use the tracking system effectively (mean = 2.953, dev = 1.187). The study showed disagreement among participants the tracking system is reliable in terms of system uptime and availability (mean = 2.734, dev = .840).

4.3.4 Technical Capabilities of Employees

The research focused on examination of the technical capabilities of employees in Nairobi County and findings are shown in Table 4.7

Table 4.7 Technical Capabilities of Employees

	N	Mean	Std. Deviation
The team has the technical skills required to operate the tracking systems	64	3.4375	.79433
There are readily available technical resources to assist in maintenance of tracking systems	64	3.2500	.92582
The tracking system supports data integration from multiple sources	64	3.1719	.82721
The tracking system has implemented cybersecurity measures to protect against cyber threats and unauthorized access	64	3.4219	.83199
The tracking system is innovative and adaptable and is keeping pace with evolving technological trends and organizational needs	64	2.9063	1.00347

The study participants were in disagreement that the team has the technical skills required to operate the tracking systems (mean = 3.437, dev = .794). The analysis revealed disagreement the tracking system has implemented cybersecurity measures to protect against cyber threats and unauthorized access (mean = 3.421, dev = .831). Findings showed disagreement the tracking system is innovative and adaptable and is keeping pace with evolving technological trends and organizational needs (mean = 2.906, dev = 1.003).

4.3.5 Revenue Collection Performance

The respondents were presented with questions on the revenue collection performance in the county and findings are shown in Table 4.8 below

Table 4.8 Revenue Collection Performance

	N	Mean	Std. Deviation
Tracking systems have streamlined the revenue collection process in Nairobi County	64	2.9531	1.10453
There has been a reduction in the time it takes to collect revenue due to the use of tracking systems	64	2.9219	1.02825
There are improvements in revenue collection rates since the implementation of the tracking system	64	3.0469	1.17419
Financial records from revenue collection processes in Nairobi County are transparent	64	2.8437	.89476
Tracking systems have reduced revenue leakage	64	2.7813	.98349
The county government utilizes the revenue collected for public services and development	64	3.3594	.80410

Findings showed disagreement the county government utilizes the revenue collected for public services and development as indicated by mean of 3.359. The results revealed disagreement there are improvements in revenue collection rates since the implementation of the tracking system (mean = 3.046, dev = 1.174). The respondents further disagreed on whether the tracking systems have streamlined the revenue collection process in Nairobi County (2.953, dev = 1.104).

Participants further noted that '*application of the tracking systems have been key to increasing visibility of the revenue collected thus can improve the collection level. The respondents acknowledged that the self-service portal provided taxpayers with an opportunity to view their charges thus fostering transparency in revenue collection. The system also increased compliance as taxpayers were aware of their payment timelines thus improving efficiency*.

However, other respondents noted the *systems has not been implemented collectively thus limiting the collection of the revenue and affecting the accuracy of the data captured. Moreso, lack of awareness has led to users not being conversant with the system thus there is need to avoid the opaqueness in implementation of the system. The participants also noted the system has leakages that results in underpayment which impacts the overall revenue collected by the county*

government. The respondents called for better user friendliness in the implementation process and improvement in data compilation to limit data inaccessibility and accuracy.

4.4 Correlation Test

Based on the data collected the aggregate mean calculated for each variable provided the composite mean that was applied in correlation tests to determine the nature of relation between the variables. The results are shown in Table 4.9

Table 4.9 Correlation Matrix

			Revenue Collection	Effectiveness Efficiency	System Compliance	Usability & Reliability	Technical Capabilities
Spearman's rho	Revenue Collection	Correlation Coefficient	1.000				
		Sig. (2-tailed)	.				
		N	64				
	Effectiveness Efficiency	Correlation Coefficient	.470**	1.000			
		Sig. (2-tailed)	.000	.			
		N	64	64			
	System Compliance	Correlation Coefficient	.542**	.218	1.000		
		Sig. (2-tailed)	.000	.083	.		
		N	64	64	64		
	Usability & Reliability	Correlation Coefficient	.355**	.280*	.599**	1.000	
		Sig. (2-tailed)	.004	.025	.000	.	
		N	64	64	64	64	
	Technical Capabilities	Correlation Coefficient	.436**	.336**	.606**	.434**	1.000
		Sig. (2-tailed)	.000	.007	.000	.000	.
		N	64	64	64	64	64

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The results of the first objective confirmed there was a weak positive and significant relation between effectiveness and efficiency of tracking systems and the revenue performance in Nairobi County (rho = .470**, sig = .000). The correlation analysis further established there was a moderate positive and significant relation between compliance of tracking systems (rho = .542**, sig = .000) and the revenue performance in Nairobi County. Findings of the third objective revealed a weak

positive and significant relation between reliability and usability of tracking systems and the revenue performance in Nairobi County (rho = .355**, sig = .000). The survey also confirmed that technical capabilities had weak positive relation with the revenue performance in Nairobi County (rho = .436**, sig = .000).

4.5 Diagnostic Analysis

The survey further employed diagnostic checks to determine the data met the threshold for regression analysis.

4.5.1 Normality Test

The research utilized the Normal p-p plot to check whether the data was from a normally distributed sample. The findings showed the observations fitted within the normality line thus indicating the observations were from a normal distribution.

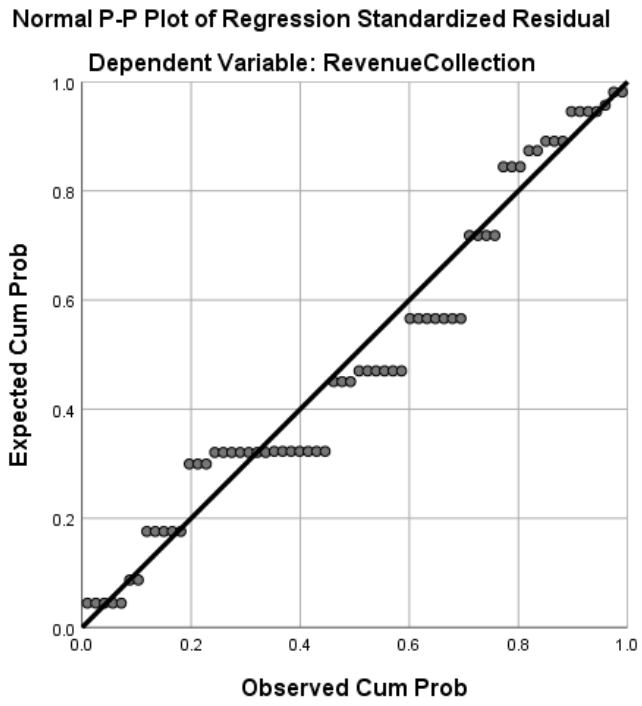

Figure 4.1 Normal P-P Plot

4.5.2 Collinearity Test

Multicollinearity check was conducted to determine whether there was any linear dependency between the independent variables. The research used both variance inflation factor and tolerance values as the basis of the analysis.

Table 4.10 Multicollinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Effectiveness & Efficiency	.855	1.170
	Compliance	.630	1.588
	Usability and Reliability	.608	1.645

a. Dependent Variable: Revenue Collection

Findings above indicated the variables had a variance inflation factor that was below 10 and tolerance values above 0.1 which was an indicator that there was no collinearity problem within the research variables.

4.5.3 Autocorrelation Test

The research checked for serial correlation which may impact the inferences drawn from the model. The survey utilized the Durbin Watson tests and findings are shown below.

Table 4.11 Autocorrelation Test

Model	Durbin-Watson
1	1.807

a. Predictors: (Constant), Usability and Reliability, Effectiveness and Efficiency, Compliance

b. Dependent Variable: Revenue Collection Performance

4.6 Regression Analysis

The research further conducted linear regression to determine the magnitude of the relationship between the selected variables and the revenue performance in Nairobi County. The study adopted two models (without & with the moderator) to determine the relationship level.

Table 4.12 Regression Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.751[a]	.563	.541	.53795
2	.762[b]	.580	.552	.53174

a. Predictors: (Constant), Reliability and Usability, Effectiveness & Efficiency, System Compliance

b. Predictors: (Constant), Reliability and Usability * Technical Capabilities, Effectiveness Efficiency* Technical Capabilities, System Compliance* Technical Capabilities, Technical Capabilities

Findings of the regression tests on the first model yielded a coefficient of $R^2 = .563$ which revealed that 56.3% of the revenue performance within Nairobi County is determined by the tracking system components (reliability and usability, effectiveness & efficiency, system compliance). Other factors not considered accounted for 43.7% of the changes in revenue performance.

The second model considered the moderating variable and the findings of the research showed an improved coefficient of determination ($R^2 = .580$) thus confirming a positive moderating effect of the model. The research showed that tracking systems and technical capabilities predicted 58% of changes in the revenue performance within Nairobi County.

Table 4.13 ANOVA Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.399	3	7.466	25.801	.000[b]
	Residual	17.363	60	.289		
	Total	39.762	63			
2	Regression	23.080	4	5.770	20.408	.000[c]
	Residual	16.682	59	.283		
	Total	39.762	63			

a. Dependent Variable: Revenue Collection

b. Predictors: (Constant), Usability & Reliability, Effectiveness & Efficiency, System Compliance

c. Predictors: (Constant), Usability Reliability * Technical Capabilities, Effectiveness Efficiency* Technical Capabilities, System Compliance* Technical Capabilities, Technical Capabilities

The analysis of the statistical significance for the first model had f-value = 25.801 and sig = .000<.05 thus confirming there was positive and significant relationship between tracking systems

and the revenue collection performance in Nairobi City County. Further the second model confirmed there was a positive and significant moderating effect of technical capabilities on the relationship between tracking systems and the revenue performance in Nairobi City County (F-value = 20.408, sig = .000).

Table 4.14 Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.932	.355		2.624	.011
	Effectiveness & Efficiency	.414	.083	.458	4.966	.000
	System Compliance	.523	.089	.630	5.859	.000
	Reliability and Usability	-.340	.134	-.279	-2.546	.013
2	(Constant)	1.144	.377		3.037	.004
	Effectiveness & Efficiency * Technical Capabilities	.461	.088	.510	5.251	.000
	System Compliance * Technical Capabilities	.594	.099	.716	5.975	.000
	Usability & Reliability * Technical Capabilities	-.320	.133	-.262	-2.411	.019
	Technical Capabilities	-.204	.131	-.181	-1.552	.126

a. Dependent Variable: Revenue Collection

$$\mathbf{Y = .932 + .414X1 + .523X2 + -.340X3 + .355}$$

Findings on the first objective revealed a coefficient β_1 **= .414, sig = .000** which revealed there was a positive and significant effect of effectiveness and efficiency of tracking systems on revenue collection performance in Nairobi City County. This showed that changing the effectiveness and efficiency will yield a .414 (41.4%) improvement in revenue collection performance in Nairobi City County. The findings on the second objective established there was a positive and significant

effect of compliance of tracking systems on revenue collection performance in Nairobi City County (**β_2 = .523, sig = .000)**.

This showed that changing the compliance to tracking systems will have a positive change of .523 (52.3%) t in revenue collection performance in Nairobi City County. The analysis of the third objective had a coefficient **β_3 = -.340, sig = .013** which revealed there was a negative and significant effect of reliability and usability of tracking systems on revenue collection performance in Nairobi City County. This showed that changing the reliability and usability will yield a -.340 (34%) decrease in revenue collection performance in Nairobi City County. The moderator analysis revealed a joint positive and significant effect of effectiveness and efficiency * technical capabilities and System Compliance * Technical Capabilities (sig = .000) with revenue collection performance in Nairobi City County. The findings showed an insignificant effect of technical capabilities (sig = .126>.05) on the revenue collection performance in Nairobi City County.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the study results and highlights a summary of these results. Based on the results, the study generates conclusions and recommendations based on the study variables. The study also suggests various areas for further research.

5.2 Summary

This study investigated the effect of tracking systems on revenue collection performance in Nairobi County. Specifically, the study examined the effect of efficiency and effectiveness of different tracking systems, compliance of different tracking systems and the reliability and usability of different tracking systems on revenue collection performance in Nairobi County. The study also examined the moderating effect of technical capabilities on revenue collection performance in Nairobi County. This study was guided by three theories: institutional theory, technology acceptance model, and the agency theory. The study used mixed research methodology and works on a sample size of 80 respondents drawn from Nairobi County Government revenue managers. The relationship between the variables was tested using correlation tests and linear regression.

Correlation tests revealed that there was a weak positive and significant relation between effectiveness and efficiency of tracking systems and the revenue performance in Nairobi County. The correlation analysis further established a moderate positive and significant relation between compliance of tracking systems and the revenue performance in Nairobi County. Correlation findings of the third objective revealed a weak positive and significant relation between reliability and usability of tracking systems and the revenue performance in Nairobi County. The survey also confirmed that technical capabilities had weak positive relation with the revenue performance in Nairobi County.

Findings from the regression analysis revealed that there was a positive and significant relationship between tracking systems and the revenue collection performance in Nairobi City County. Further the results confirmed that there was a positive and significant moderating effect of technical capabilities on the relationship between tracking systems and the revenue performance in Nairobi City County. Findings on the first objective revealed a positive and significant effect of effectiveness and efficiency of tracking systems on revenue collection performance in Nairobi City

County. Findings on the second objective established there was a positive and significant effect of compliance of tracking systems on revenue collection performance in Nairobi City County. The analysis of the third objective revealed that there was a negative and significant effect of reliability and usability of tracking systems on revenue collection performance in Nairobi City County. Finally, the findings showed an insignificant effect of technical capabilities on the revenue collection performance in Nairobi City County.

5.3 Discussion of Findings

Findings from the regression analysis revealed that there was a positive and significant relationship between tracking systems and the revenue collection performance in Nairobi City County. These findings align with all the three theories adopted in the study. Institutional Theory supports the idea that by adopting tracking systems, the county enhances its legitimacy and operational efficiency. The significant positive impact on revenue collection performance aligns with the theory's premise that conforming to institutional norms by adopting modern tracking systems results in improved organizational outcomes. For the Technology acceptance model, the significant relationship indicates that the tracking systems are perceived as useful tools for improving revenue collection performance. This aligns with TAM, which suggests that perceived usefulness is a key determinant of technology adoption. Finally, Agency theory suggests that effective monitoring mechanisms reduce moral hazard and ensure compliance. The findings align with this theory, as tracking systems provide robust monitoring capabilities that enhance compliance and reduce opportunities for tax evasion or fraud, leading to improved revenue collection performance.

5.3.1 Effectiveness and Efficiency of Tracking Systems and Revenue Collection Performance

Findings on the first objective revealed a positive and significant effect of effectiveness and efficiency of tracking systems on revenue collection performance in Nairobi City County. The positive impact of tracking systems found in the study is consistent with Jackson and White's (2019) findings that GPS-enabled tracking systems provide real-time data, thereby reducing revenue leakage. Both studies similarly highlight the effectiveness of tracking systems in improving monitoring and transparency in revenue flows, leading to enhanced revenue collection performance. Patel et al. (2021) emphasized the transformative effect of digital payment platforms on revenue collection efficiency by reducing administrative burdens and delays. The current

study's findings echo this by demonstrating that incorporating digital payment options within tracking systems can streamline revenue collection processes and enhance overall efficiency.

The study findings were also corroborated by Williams and Johnson (2022) who identified that combining tracking systems with data analytics could significantly enhance revenue collection processes. The current study's positive findings suggest that leveraging advanced tracking technologies, potentially coupled with data analytics, can indeed lead to more proactive and efficient revenue management strategies. Turner and Garcia (2021) found that blockchain technology could significantly enhance transaction security and transparency, reducing fraud and corruption risks. The current study's emphasis on transparency aligns with these findings, suggesting that incorporating blockchain features could further improve the effectiveness of tracking systems.

The study findings were also in line with Lee et al. (2023) who highlighted the role of AI in enabling real-time decision-making and predicting revenue patterns. The current study underscores the significance of modern tracking systems in enhancing the accuracy and timeliness of revenue information, which is critical for effective revenue collection. The study findings were however divergent from Smith and Brown (2020) who highlighted challenges related to the lack of interoperability and data integration between different tracking systems. Although the current study found a significant positive impact of tracking systems on revenue collection, it did not specifically address integration issues. Future research could delve deeper into how integration and interoperability affect overall system efficiency in Nairobi City County.

5.3.2 Compliance of Tracking Systems and Revenue Collection Performance

Findings on the second objective established there was a positive and significant effect of compliance of tracking systems on revenue collection performance in Nairobi City County. The study findings were corroborated by Anderson and Johnson (2018) who found that tracking systems positively influence taxpayers' compliance behavior by offering transparency and reducing opportunities for tax evasion. The current study findings align with this by demonstrating that tracking systems enhance compliance and, consequently, revenue collection performance in Nairobi City County. The transparency provided by real-time monitoring encourages taxpayers to adhere to tax obligations.

The study was also supported by Brown et al. (2022) who revealed that user-friendly tracking interfaces significantly enhance taxpayer satisfaction, which in turn fosters trust in revenue authorities. The findings from the current study support this notion, highlighting that tracking systems improve compliance by making the process more convenient and transparent for taxpayers, thereby increasing their satisfaction and willingness to comply. Additionally, findings were consistent with Johnson and Garcia (2020) who emphasized the role of data privacy in improving taxpayer compliance suggesting that secure data handling within tracking systems encourages compliance. The positive findings from the study are in line with this, as ensuring data privacy within tracking systems can mitigate taxpayer concerns, leading to higher compliance rates.

The findings were also in line with Smith et al.'s (2021) study which found that mobile tracking applications enhance compliance and satisfaction due to their accessibility and user-friendliness. The current study corroborates this by showing that tracking systems, which include mobile applications, make it easier for taxpayers to comply with tax obligations, thus improving revenue collection performance. Furthermore, Turner and Patel (2019) highlighted the connection between tracking accuracy and revenue collection outcomes, noting that improved tracking accuracy leads to reduced revenue leakage and increased collection efficiency. These findings align with the findings in the current study, as the compliance promoted by accurate tracking systems directly contributes to more effective revenue collection in Nairobi City County.

5.3.3 Reliability and Usability of Tracking Systems and Revenue Collection Performance

The analysis of the third objective revealed that there was a negative and significant effect of reliability and usability of tracking systems on revenue collection performance in Nairobi City County. This indicates that challenges related to the reliability and usability of tracking systems are adversely affecting their effectiveness in enhancing revenue collection. This finding contrasts with some previous studies, while aligning with others. The findings were in line with Karim, Haque, Ulfy, Hossain, & Anis (2020) who found that digital payment systems generally demonstrated high reliability, although technical glitches like network downtime and system errors were identified as barriers. The current findings indicate significant negative effects due to reliability issues, which are similar to Karim et al.'s conclusion that reliability issues were

detrimental. This suggests that in Nairobi City County, reliability problems might be more severe, thus having a more substantial negative impact on revenue collection performance.

Findings were further corroborated by Souza, Seruffo, De Mello, Souza, & Vellasco (2019) who noted significant variations in usability across different software interfaces, with factors like interface complexity and navigation structure influencing perceptions of usability. The current study findings align with Souza et al.'s (2019) conclusions that usability issues can negatively impact system effectiveness. Both studies underscore the importance of a user-friendly interface for ensuring effective revenue collection.

The study was also in line with Wasunna (2018) who found a significant relationship between user experience and access to government services, with usability factors such as app design, transaction speed, and payment confirmation processes being critical. The study's findings that reliability and usability issues negatively affect revenue collection performance align with Wasunna's (2018) observations as both studies highlight that poor usability and reliability can significantly impair the effectiveness of digital systems in government services

5.3.3 Technical Capabilities and Revenue Collection Performance

Finally, the findings showed an insignificant effect of technical capabilities on the revenue collection performance in Nairobi City County. The study findings contrast with Tahar, Riyadh, Sofyani, and Purnomo (2020) who found that technological skills had a positive and significant impact on the intention to use e-filing. The study notes that one possible reason for the divergence could be differences in the technological maturity and infrastructure between Korea and Nairobi City County. Nairobi may face unique challenges, such as resource constraints and infrastructural limitations, that could dampen the expected positive impact of technical capabilities on revenue collection performance.

The study findings were also disputed by Nakano, Tsusaka, Aida, and Pede (2018) who found that technical training led to increased technology adoption and higher productivity. The findings note that in Nairobi City County, it appears that simply having technical capabilities may not be enough to overcome other systemic issues that impede revenue collection performance. This might be due to systemic challenges specific to Nairobi, such as bureaucratic hurdles, resistance to change, or

inefficiencies in existing processes. These contextual factors might overshadow the potential benefits of enhanced technical capabilities.

Karimi, Maina, and Kinyua (2017) further found that technology had a significant effect on revenue collection, and that the skills required to use and implement this technology were important. The current study's findings diverge from this, suggesting that in Nairobi City County, the presence of technical capabilities alone does not translate into better revenue collection performance. This could imply that other factors, such as system integration, user acceptance, or organizational support, may be limiting the effectiveness of these technical capabilities. The lack of significant impact might also point to integration and usability issues within the tracking systems. If the systems are not well-integrated or user-friendly, technical capabilities may not be fully leveraged, resulting in minimal impact on revenue collection performance.

5.4 Conclusions

The study found that taxpayers can easily access tracking systems in Nairobi County, indicating that efforts to make these systems accessible to the public have been successful. The study further found that implementation of tracking systems has improved accessibility to accurate revenue information for taxpayers contributing to better-informed decision-making by taxpayers, leading to increased compliance and revenue collection. The study also revealed that the benefits of implementing tracking systems, such as increased revenue collection and efficiency gains, outweigh the costs associated with their implementation and maintenance. The tracking system has also reduced administrative costs associated with revenue collection processes due to increased efficiency in data management and processing. In conclusion, the findings from the first objective suggest that the effectiveness and efficiency of tracking systems have a positive and significant impact on revenue collection performance in Nairobi City County.

Based on the second objective, the study reported that it is easier to register and comply with tax obligations using the tracking system compared to traditional methods which contributes to increased taxpayer engagement and adherence to tax laws and regulations. The study further found that the tracking system is effective in detecting and discouraging tax evasion or fraud. Participants indicated that the tracking system has influenced their willingness to comply with tax laws and regulations voluntarily suggesting that tracking systems play a role in promoting a culture of voluntary compliance among taxpayers. The study also noted that the tracking system has

improved the fairness and consistency of compliance enforcement actions. The findings from the second objective thereby led to the conclusion that compliance of tracking systems has a positive and significant effect on revenue collection performance in Nairobi City County.

The analysis of the third objective revealed that there was a negative and significant effect of reliability and usability of tracking systems on revenue collection performance in Nairobi City County. Participants from the study reported that the tracking system is less reliable in terms of system uptime and availability which may lead to disruptions in revenue collection processes, potentially impacting revenue collection performance negatively. The study also found that participants had received inadequate training and support to use the tracking system effectively which may lead to underutilization of system functionalities, decreased user proficiency, and ultimately, reduced revenue collection performance. The study also noted that while the tracking system is reliable in capturing all user information, there were potential concerns about the completeness and accuracy of captured information, which can affect the reliability of revenue collection data.

Finally, the findings showed an insignificant effect of technical capabilities on the revenue collection performance in Nairobi City County. The findings of the study suggest that while technical capabilities such as team skills, resource availability, data integration support, cybersecurity measures, innovation, and adaptability are important for the operation of tracking systems, they do not have a significant impact on revenue collection performance in Nairobi City County.

5.5 Recommendations

5.5.1 Policy Recommendations

Informed by the conclusion that the effectiveness and efficiency of tracking systems positively impacts revenue collection performance, the study provides various recommendations. The study recommends investing in upgrading tracking systems to improve transaction processing time and reduce administrative costs further. The study also suggests that revenue collectors should conduct regular evaluations of the cost-effectiveness of tracking systems to ensure optimal resource allocation. Additionally, the study recommends development of new and enhancement of already existing training programs for personnel to maximize the utilization of tracking system features and functionalities. The regulators and Kenya Revenue Authority should continuously monitor

and evaluate the performance of tracking systems to identify areas for improvement and optimization.

5.5.2 Practical Recommendations

Compliance of tracking systems had a positive and significant effect on revenue collection performance. Based on this conclusion, the study suggests and increase of public awareness and education campaigns to promote the benefits of using tracking systems for tax compliance. The study further recommends that the government should take measures to strengthen enforcement measures to deter tax evasion and fraud effectively, leveraging the capabilities of tracking systems for enhanced detection and enforcement. Kenya Revenue Authority should also develop and implement targeted incentives and rewards programs to incentivize voluntary compliance among taxpayers, leveraging insights from tracking system data analytics. They should also foster partnerships and collaborations with relevant stakeholders, including business associations and community organizations, to promote a culture of tax compliance and cooperation.

Reliability and usability of tracking systems had a negative and significant effect on revenue collection performance. Based on this conclusion, the study recommends that Kenya Revenue Authority should prioritize efforts to improve system uptime and availability, including investing in infrastructure upgrades and redundancy measures. They should also invest in continuous system maintenance and updates to address technical issues promptly and maintain system reliability over time. This will ensure less disruptions in revenue collection processes thereby enhancing revenue collection performance. The study also recommends conducting of regular user experience assessments and gather feedback from stakeholders to identify areas for improving the usability and interface design of tracking systems. The study further recommends that the revenue collection body should implement user-centered design principles to tailor tracking system features and functionalities to meet diverse user needs and preferences.

Based on the conclusion that technical capabilities had an insignificant effect on the revenue collection performance, the study recommends increased investment in ongoing training and capacity-building programs to enhance technical skills among personnel responsible for operating and maintaining tracking systems. The study also recommends exploring opportunities for integrating advanced data integration technologies to enhance the interoperability and scalability of tracking systems. Furthermore, the relevant firms should continuously monitor and assess

cybersecurity risks and implement proactive measures to protect tracking systems from cyber threats and vulnerabilities. The study also recommends collaboration and knowledge sharing among technical teams, stakeholders, and industry experts to leverage best practices and emerging technologies for continuous improvement of tracking systems.

5.5.3 Limitations of the Study

The research was limited only to revenue collection within Nairobi City County hence there is more need for more comprehensive research focusing on all the counties across the country. The study was further limited by accessibility of participants owing to their tight work schedules which impacted the rate of response and time required to undertake the survey. The examination was further limited by lack of adequate reports on the rate of automation of revenue collection within the county.

5.6 Area for Further Research

This study investigated the effect of tracking systems on revenue collection performance in Nairobi County. Further research could be conducted in other counties and regions around the country to understand how the tracking systems affect revenue collection around the country. Additionally, comparative research could be conducted to find out how on revenue collection performance in Nairobi County compares to other regions globally and to how tracking systems impact the performance. Finally, the study suggests further longitudinal studies to assess the long-term impact of tracking systems on revenue collection performance.

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APPENDICES

Appendix I: Letter of introduction

Dear Participants,

I sincerely appreciate your time and participation in this important research study focused on the "Impact of Tracking Systems on Revenue Collection Performance in Nairobi County." Your insights and opinions are invaluable in helping us gain a deeper understanding of the effects of tracking systems on revenue collection processes within the county. The main objective of this research is to comprehensively examine how tracking systems influence revenue collection performance in Nairobi County.

Your participation involves providing your honest opinions and assessments based on your experiences and observations. Your responses was treated confidentially and will contribute significantly to the validity and reliability of our findings. I genuinely appreciate your commitment to this study. Your valuable input will undoubtedly contribute to a better understanding of the impact of tracking systems on revenue collection performance.

Thank you for your time and dedication.

Appendix II: Research Questionnaire

Section 1: Demographic Information

1. **Please indicate your age.**

   Below 35 years of age ( )

   36-45 years of age ( )

   46-55 years of age ( )

   Over 56 years ( )

2. **Please indicate your gender.**

   Male ( )

   Female ( )

3. **How long have you worked in Nairobi County?**

   Below 5 years ( )

   6-10 years ( )

   11-15 years ( )

   Over 16 years ( )

PART B: EFFECT OF TRACKING SYSTEMS ON REVENUE COLLECTION PERFORMANCE IN NAIROBI COUNTY

Please indicate in the table with a tick (√) or across (×) with a scale of

5= strongly agree 4= Agree 3= Disagree 2= Strongly Disagree 1= Not at all

	Effectiveness and Efficiency of Tracking Systems	**1**	**2**	**3**	**4**	**5**
1.	Taxpayers can easily access tracking systems in Nairobi County					
2.	The use of tracking systems enhances transparency in revenue collection processes					
3.	Implementation of tracking systems has improved accessibility to accurate revenue information for taxpayers					
4.	The tracking system is cost effective					
5.	The tracking system has reduced administrative costs associated with revenue collection processes					
6.	Revenue forecasts generated by the tracking system are accurate and reliable					
7.	Taxpayers are sufficiently informed about the available tracking systems					

	Compliance to revenue collection	**1**	**2**	**3**	**4**	**5**
1.	It is easier to register and comply with tax obligations using the tracking system compared to traditional methods					
2.	The tracking system is effective in detecting and discouraging tax evasion or fraud					
3.	The tracking system has influenced your willingness to comply with tax laws and regulations voluntarily					
4.	The tracking system is transparent and informative in communicating tax obligations and enforcement measures					

5.	The tracking system has improved the fairness and consistency of compliance enforcement actions					
6.	Tracking systems encourage taxpayers to comply with revenue payment deadlines					

	Usability and Reliability of Tracking Systems	**1**	**2**	**3**	**4**	**5**
1.	The tracking system is reliable in terms of system uptime and availability					
2.	The interface design of the tracking system is intuitive and user-friendly					
3.	You have received adequate training and support to use the tracking system effectively					
4.	The tracking system accommodates different user needs and preferences					
5.	The tracking system has error handling mechanisms to identify and resolve data processing errors					
6.	The tracking systems is reliable in capturing all user information thus supporting review of revenue collection					

	Technical Capabilities	**1**	**2**	**3**	**4**	**5**
1.	The team has the technical skills required to operate the tracking systems					
2.	There are readily available technical resources to assist in maintenance of tracking systems					
3.	The tracking system supports data integration from multiple sources					
4.	The tracking system has implemented cybersecurity measures to protect against cyber threats and unauthorized access					
5.	The tracking system is innovative and adaptable and is keeping pace with evolving technological trends and organizational needs					

PART C: REVENUE COLLECTION PERFORMANCE IN NAIROBI COUNTY

Please indicate in the table with a tick (√) or across (×) with a scale of

5= strongly agree 4= Agree 3= Disagree 2= Strongly Disagree 1= Not at all, the extent to which you agree with the statements below.

	Revenue Collection	**1**	**2**	**3**	**4**	**5**
1.	Tracking systems have streamlined the revenue collection process in Nairobi County					
2.	There has been a reduction in the time it takes to collect revenue due to the use of tracking systems					
3.	There are improvements in revenue collection rates since the implementation of the tracking system					
4.	Financial records from revenue collection processes in Nairobi County are transparent					
5.	Tracking systems have reduced revenue leakage					
6.	The county government utilizes the revenue collected for public services and development					

In what ways do you think the use of tracking systems enhances transparency in revenue collection processes?

……

……

How has the implementation of tracking systems improved accessibility to accurate revenue information for taxpayers, in your experience?

……

……

How do tracking systems encourage taxpayers to comply with revenue payment deadlines, in your experience?

……

……

How do you perceive the transparency and monitoring of revenue collection processes in Nairobi County?

……

……

Thank you for participating

Appendix III: Ethics Letter

Strathmore UNIVERSITY

4th April 2024

Mrs Woyengo Michelle,
woyengo.michelle@strathmore.edu

Dear Mrs Woyengo,

RE: Impact of Tracking Systems on Revenue Collection Performance in Nairobi County

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC2088/24.** The approval period is from **4th April 2024 to 3rd April 2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification.
iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours.
v. Clearance for the export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

Mr Ambrose Rachier,
Chairperson; SU-ISERC

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
04-Apr-2024
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

Appendix IV: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **608575**

Date of Issue: **17/April/2024**

RESEARCH LICENSE

This is to Certify that Miss.. Michelle Vanessa Woyengo of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: EFFECT OF TRACKING SYSTEMS ON REVENUE COLLECTION PERFORMANCE IN NAIROBI COUNTY for the period ending : 17/April/2025.

License No: **NACOSTI/P/24/34756**

608575

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)

Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and Innovation(NACOSTI),
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