

**INFORMATION MANAGEMENT SYSTEMS STRATEGIES TO SUPPORT THE
INTEGRATION OF KENYA'S E-GOVERNMENT SERVICES
A CASE STUDY OF THE KENYA REVENUE AUTHORITY**

TEJWOK SIMON AJAK

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DECLARATION

I declare that this research thesis is my original work and has not been presented in any other university.

Tejwok Simon Ajak

SIGNATURE

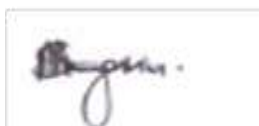


Date: 30/08/2024

This research thesis has been submitted for examination with our approval as university supervisors.

Mr. David Munene

SIGNATURE



DATE**30/08/2024**.....

Mr. Peter Waweru

SIGNATURE..... DATE **30/08/2024**

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DEDICATION

I dedicate this thesis to my dear mother, my nuclear family, siblings, and all those who encouraged me tirelessly in the course of my studies.

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Special gratitude goes to my supervisors for their support, guidance and assistance in handling this thesis. Utmost gratitude to Our Lord Jesus Christ for giving me strength and wisdom, which has seen me through this task.

ABSTRACT

The purpose of this research thesis was to examine how information management system methods can be applied to successfully integrate electronic government service modules for effective service delivery and revenue collection. Despite reporting higher collections, the Kenya Revenue Authority (KRA) failed to meet its income objectives for the 2022–2023 fiscal year by Kes107 billion. The domestic excise tax was one of the bands that fell short of the goal, performing below average at 91.4 percent to achieve Kes 68.124 billion. However, the taxman claimed that earnings from the betting excise tax came to Sh6.65 billion, exceeding the objective of Kes 5.72 billion. This result was ascribed by KRA to the betting companies' smooth integration into the KRA tax system. This integration has greatly increased revenue collection and expedited the sector's tax payment procedure. The agency connected its systems with the betting companies' systems around the end of 2022. This connectivity has made it possible to collect taxes in real-time and has increased visibility into the revenue these businesses generate. This descriptive-analytical study used a descriptive research design to investigate the information systems management strategies for the integration of e-government services with the Kenya Revenue Authority as a case study. This was done on a targeted population of 256 management staff extracting a sample size of 72 respondents using structured questionnaires. Interviews were conducted on normal tax payers, corporate taxpayers from 2 select companies, 2 KRA commissioners related to the ICT integration strategy and 4 senior ICT staff attached to the ICT authority. The questionnaires received responses from 66 staff members in total, or almost 91% of the intended audience. IBM's SPSS version 26 was used to examine the data sets. The emergent independent variables (information systems, digital infrastructure and stakeholder involvement) and the dependent variable underwent qualitative data analysis. After that, inferential statistics were used to determine how information management system strategies would influence KRA system integration with the e-government platform. This included regression and correlation analysis. Information systems and stakeholder participation had a positive connection with the dependent variable. Digital infrastructure strategy did not have a significant correlation with integration of e-government services as most respondents did not agree with the compliance of standards and reliability of the current infrastructure at KRA (data center issues $M=2.59$, $SD=1.268$; Network infrastructure issues $M=2.91$, $SD=0.944$). In conclusion, the findings indicated that information systems strategy had a strong significance on the integration with e-government services despite the weak significance of the digital infrastructure variable. A proper information management system to check the flow of revenue data is necessary. This research focused on examining the utilization of information management systems integration strategies by the KRA.

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ABBREVIATIONS AND ACRONYMS

IS	: Information Systems
E-Government	: Electronic government
KRA	: Kenya Revenue Authority
IT	: Information technology
IMS	: Information management systems

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Today, revenue collection is essential to any civilization. It originated in the early ages of civilization and was a means by which the government obtained funds to continue operating for the benefit of its citizens (Broadway, 2012). The best practices of equity, ability to pay, economic efficiency, convenience and predictability should all be adhered to when collecting taxes (Visser & Erasmus, 2005). Similar to any organization, the government looks for methods to cut back on spending in order to have a reciprocal impact on the economy's public national debt (Ireland, 1994). Various accounting and control measures are typically taken to guarantee that the expenditures adhere to the framework and policies of the government. Among the many controls are checks and balances, fiscal restrictions, and many more. This covers the entire justification for any corporate, public or private institution, which seeks to achieve its ultimate goals by increasing revenue and decreasing expenditure. (International Monetary Fund [IMF], 2014). A crucial first step in making government into an organization capable of meeting the demands, specifications and expectations of the contemporary world is the application of technical solutions to the strategic goals of the government (De Wulf & Sokol, 2005).

Information management systems are among the most significant technology components of the contemporary business environment. Because they can collect, process, distribute and share data in an integrated and timely manner, they offer companies high prospects for success (Rocheleau, 2006). One such organization, KRA, is heavily reliant on computerized frameworks and procedures in order to fulfill its financial obligations to the Kenyan

government. According to the Kenya Revenue Authority (2012), the KRA is a Semi-Autonomous Government Agency (SAGA) with the goal of organizing, collecting, evaluating, and carrying out operations related to assessment and income. Additionally, information systems help close geographic gaps by enabling workers to be more productive. This improves administration, information management, and procedures, which benefits businesses' productivity and competitiveness (Prybutok et al., 2008). An organization's information management system, like the nervous system in the human body, connects all of the organization's parts to enable improved operation and survival in a hostile environment. Undoubtedly, information is the lifeblood of today's businesses (Dandago, 2012).

Information systems (IS) are required for public service to succeed in its functions of service delivery, oversight, policy formulation, and accountability. A change from input- and resource-focused administration to output- and performance-based public service has been brought about by public service reforms (Scatteman, 2010). To determine if government services improve the lives of its residents, it is necessary to measure policy outputs and outcomes precisely. To do this, technology must be used to collect, evaluate, and analyze data. Government organizations gather, handle, and report on data for planning and reporting needs in order to meet legal obligations and evaluate how well the government is handling issues related to service delivery. Both operational and strategic levels involve the gathering and use of information (Otley, 2002). They are employed in the operational level to keep an eye on outcomes, manage tasks, and assess and design new services. According to Melville et al. (2004), they are used at the strategic level to list patterns and practices that assist higher management in supervising an enterprise's strategic path. The process of converting raw data into information begins with carrying out logically related operations to produce an outcome.

Government information systems are made to assist, or computerize, the business operations of government agencies, enabling them to carry out their duties efficiently and effectively. The use of e- government is one such aspect. The advantages of e-government include improved public access to information, heightened government accountability and a more effective and efficient civil service. In the end, a lot of nations saw e-government as a way to further improved service delivery and information sharing. Realizing the importance of data in governance of the public sector, a series of developments has been made on information system models and frameworks. Scatteman (2010), among other scholars in the 1980s, developed a sociotechnical approach to information systems technology. In the famously known Social Construction of Technology (SCOT) model, the scholars pose information system technologies to include, beyond the technology infrastructure, non-technical components such as the social human beings. This was in a bid to integrate information system technology in organizations and business operations. Technology, according to Kroes and Meijers (2006), has a dual nature. Technologies first and foremost realize functions based on human intentionality in the form of physical structures. Subsequently, Orlikowski and Iacono (2001) attempted to apply comparable methods to IS and conceptualized IS as a collection of individuals, tasks, tools, artifacts, and policies. They argued in favor of a sociotechnical ensemble approach, which focuses on how people and technology interact during development, application, and societal situations.

With information systems technology now blended into the organizational culture and integrated in its business operations, Melkers and Willoughby (2005) would then formulate a framework to expedite business processes using technology. They advocate for client/server technology, which would reorganize business flow processing in part by moving it closer to the work node. Using the electronic data interchange (EDI) model they developed, organizations

would minimize the delays and mistakes brought on by manual data manipulation by creating a fully automated information system for the business process. However, systems have been put in place by the public sector to blend information systems in their operations and to optimize their usage flow, organizations still lack the right amounts of data to make the systems accurate and fully reliable in business process. Processes undertaken in the fulfillment of service obligation by a government to its people are guided by sets of policies and strategic decisions. Some of these decisions are taken on novel situations facing the government agencies whereas others are taken under looming crises. Decisions by government agencies are very critical according to Prins et al. (2012), as they involve many people with diverse interests and opinions and their outcome affects a whole lot of people. Decisions made by government agencies need to therefore have high levels of accuracy, whose certainty can only be guaranteed by basing the decision on proven facts. Facts are ratified by the support of data, and effective decision making involves converting the data into meaningful information, drawing conclusions and inferring them to practicality for decisions. In addition to impacting revenue collection, expenditure and clearance times, automation of the tax system will also have an overall staffing effect. This will ensure that appropriate tax assessments have been made in order to discourage underpayments and tax evasions and to establish appropriate mechanisms for accountability and audit trails in order to reduce embezzlements. Usually, synchronizations and integration of different modules in different systems leading to a common repository mapping are used to do this successfully (Dramod, 2004).

1.2 E-Government and E-services

E-government is the term used to describe how government agencies are using various information technologies, such as Wide Area Networks, the Internet, and Mobile Computing, to revolutionize how they operate. The goal is to improve effectiveness, efficiency, service

delivery, and democracy (United Nations [UN] & American Society for Public Administration [ASPA], 2001). Information technology is used to facilitate government operations, provide necessary investments in personnel, equipment, regulations and procedures, involve the public and deliver public services. One essential component of modernizing government is e-government. It provides a common structure and guidance for the public sector as well as improving cooperation between public sector institutions and organizations, the government and the business community, and the government and the people it serves. It also offers advice on how public servants might get the know-how needed to seize the new opportunities brought about by ICT innovations like the internet. The term "E-Government" also refers to a wide range of information technologies that are not based on the internet, such as cell phones, landlines, televisions, radio-based government service delivery, short text messaging, and closed circuit television. It is not limited to computerizing government services and using the internet. In many areas of government, information technology (IT) is utilized to make information creation, processing, storage, distribution, transmission, and application easier. The following components are necessary for the deployment of e-Government: Information-rich websites, enhanced service delivery, reasonably priced and consistent electricity and telecommunications, technologically savvy citizens, advanced infrastructures, including computer gear and software, sufficient financial resources, the availability of skilled personnel to gather and organize data, and carefully considered government regulations (Sillock, 2001).

Many governments throughout the world have embraced e-Government as a useful tool for communicating with their constituents and other various stakeholders after realizing the advantages it offers. However, presently A paradigm change has occurred because governments are now just as interested in using the internet for daily operations (Zhu & He, 2002).

Considering that ICT is largely utilized to provide e-Government services, understanding IT adoption is crucial. We could go into further detail to learn more about how e-Government solutions are accepted and used. According to Chen et al. (2009), the term "e-government" describes how government organizations use IT to increase their operational efficacy and efficiency in handling citizen requests and providing services.

The range of e-Government services includes everything from putting information on a website that is commonly sought to offering and handling online requests like electronic tax or visas fee payments etc. Despite the challenges, Kenya has gained attention for the strides made in e-Government deployment. This is demonstrated by the United Nations e-Government readiness ranking, where Kenya was placed 122nd out of all countries in 2007 and 2008. Kenya has remained in the top ten in Africa for the past two years.

1.3 Kenya's E-citizen Portal

The Kenyan government introduced the e-Citizen integrated e-Government services portal in 2014, enabling the pilot program's online delivery of 41 services and digital payment of those services via electronic card, electronic bank transfer and mobile money. Additionally, the government established Residents can acquire and pay for over 45 services at Huduma Centers, which are specialized service delivery facilities, with cash or an electronic payment mechanism (Oduor, 2019). Through this program, the government demonstrated its dedication to lowering service delivery inefficiencies brought on by a lack of resources, theft, bureaucratic red tape, and a lack of accountability. Paying for services in an efficient manner has become a basic function of the government. The e-Citizen platform's promotion made services easier to access, cut expenses and increased revenue collection all at once. Long, meandering lines that dominated government offices shrank or vanished entirely as more people embraced the new method, making it considerably simpler to obtain services. The government increased

individuals' freedom to make payments and access services from a distance by digitizing services and payments. When compared to other digital modes of payment, mobile payments swiftly gained popularity (Wasunna & Frydrych, 2017).

Kenya began implementing e-Government programs in 2005. However, due to a lack of coordination and hasty digital service launches by government agencies, future projects were severely fragmented. The primary problems were the absence of a single payment gateway that would have provided all government ministries with a single point of collection, disagreements over the framework and implementation schedule for policies, subpar management practices, and improper payment service integration into recently launched platforms. Consequently, several ministries established their own independent payment channels, and initiatives to establish a common gateway, like Post Pesa, were unsuccessful (Asiligwa, 2016). A taskforce was established in 2013 in response to a presidential directive to begin the process of digitization and to introduce e-Government services. e-citizen was conceived with the core objective to lower the costs associated with pilferage, increase collections, centralize services, enhance revenue collection monitoring, accounting, reconciliation, and reporting, lower the risks and expenses associated with cash handling, combine government data on services and payments nationwide, and enhance decision-making regarding service delivery procedures.

The current e-citizen portal is the mechanism that applies the numerous e-services links to the several agencies and bodies providing these services. A portion of the information and services are manually supplied by periodically uploading files to the database-maintaining e-Citizen system. The outcomes of this include redundant data, inconsistent and incomplete information, and out-of-date data. Additionally, the absence of a KRA integration module and other essential government services makes the e-citizen portal fall short of its overall objective.

1.4 The Kenya Revenue Authority

The primary objective of the Kenya Revenue Authority, a semi-autonomous government organization established in 1995, is to grant operational sovereignty in the administration and collection of taxes. By virtue of an Act of Parliament (Cap. 469), the Kenya Revenue Authority was created as a separate entity for tax administration, independent of the Treasury. Kenya Revenue Authority (KRA) was founded in 1995 and is tasked with raising funds for the country's estimated 48 million residents, a number that is expected to rise by one million every year, on behalf of the Kenyan government (Macharia, 2016). Enhancing government revenue mobilization, offering sustainable revenue collection, and efficient tax administration are the three main responsibilities of KRA (Government of Kenya [GOK], 2003).

The Commissioner General of the organization reports mainly to an autonomous Board of Directors. However, because KRA continues to be a representative of the Kenyan government, the cabinet secretary in charge of finances still retains the power to decide on policy direction. When KRA was founded, the Departments of Income Tax, Value Added Tax, Customs and Excise were merged with the Ministry of Finance's Road Transport Department in addition to other departments (Kenya Revenue Authority [KRA], 2021). The agency's operations therefore involve following up on the tax payers to ensure that all collectable revenue in accordance with the written laws and provisions is garnered to the country's treasury. To effectively undertake this mandate, the agency relies heavily on data of the tax payers to assess their taxable income and hence determine their taxation levels and payment status.

The more data the agency is able to access, the more effective it is going to be in executing this mandate. Information sharing and data integration are necessary for integrated policy management and service delivery inside an organization. Integration of data from many domains is crucial to enable essential business tasks, according to Melkers and Willoughby

(2005). According to Scatteman (2010), Data silos can be broken down and the aggregation of data from multiple sources made possible by data integration between business divisions. A coordinated data and information management plan is necessary for an organization-wide approach to data and information management at the organizational level, according to Mimba et al. (2007). Large volumes of data can be analyzed with the best use of information management systems. In order to break down organizational silos, government departments can share business processes and technologies and integrate data and information (Melville et al., 2004).

KRA encountered severe difficulties in the early years of its establishment due to inadequate operating procedures and undocumented internal business processes. Inadequate and subpar use of ICT in company operations was another issue. In addition, there were issues with a bad corporate culture, a lack of cooperation and integration between the divisions responsible for collecting money, a workforce with a low work ethic that contributed to low staff integrity, and a bad reputation among the general public. Departmental silos result from an unsuitable organizational structure that prioritizes tax heads over functional lines, which causes a lack of operational synergy, a cohesive corporate culture, and duplication of efforts and structures. According to a Transparency International assessment from June 2002, Kenya placed KRA 14th out of 50 public organizations in terms of corruption; this indicated that the organization was dealing with significant issues with personnel integrity (KRA, 2012). According to a Transparency International survey from June 2020, Kenya placed KRA 14th out of 50 public institutions in terms of corruption; this indicated that the agency was dealing with significant issues with worker integrity (KRA, 2021).

1.5 Statement of the Problem

As Kenya continues to make strides towards digital transformation and the implementation of e-Government initiatives, the Kenya Revenue Authority (KRA) faces challenges in achieving seamless information systems integration. Governments everywhere have pushed hard to implement electronic frameworks with Kenya's e-government serving as an excellent example. Every open organization structure revolves around a productive national income accumulation framework, which also serves as the cornerstone of good monetary management. It discourages responding to seaward sourcing since it gives governments the authority to finance budget shortfalls from domestic sources. In order to make vital obligation data easier to acquire, the majority of African governments and assessment experts have been making an effort to link labor cost, organization expense and VAT to globally recognized practices.

Despite reporting higher collections, the Kenya Revenue Authority (KRA) could not meet its revenue objectives for the 2022–2023 fiscal year. The taxman missed his Sh2.273 trillion projections by Sh107 billion, even though receipts increased 6.7% to Sh2.166 trillion. The tax collector reports that the excise tax on wagering brought in Sh6.65 billion, above the target of Sh5.72 billion. The KRA credits this result to the betting companies' smooth integration into the KRA tax system. This integration has greatly increased revenue collection and expedited the sector's tax payment procedure. The organization connected its systems to those of the betting companies in October of the preceding year. Real-time tax collection and more visibility into the revenue these businesses earn have been made possible by this integration.

The integration of diverse information systems is crucial for the success of e-Government, particularly in the context of revenue collection and tax administration. The existing systems may be fragmented, leading to inefficiencies, data inconsistencies and potential security vulnerabilities. With an effective integration, not segregated from other sources such as health

ministry's birth registration and other national fee collection points, the KRA would be able to keep track of an individual's tax obligations. The problem at hand revolved around the identification and implementation of effective information systems integration strategies to enhance the operational efficiency and effectiveness of Kenya's e- Government initiatives, with a specific focus on the Kenya Revenue Authority.

1.6 General objective

The general objective of this study was to investigate the application of information management system strategies in supporting the successful integration of e-government service modules for the efficient delivery of services and revenue collection.

1.6.1 Specific objectives of the Study

- a) To evaluate the existing information management systems used by the Kenya Revenue Authority to understand their capabilities and integration potential with e-government services.
- b) To investigate KRA's stakeholder participation to gather requirements, expectations and feedback regarding the integration of e-government services.
- c) To assess the current digital infrastructure within the Kenya Revenue Authority for seamless e-government integration.
- d) To improve the current Service Oriented Architecture model to use information management systems for the successful integration of e-government services.

1.6.2 Research Questions

- a) Which information management systems are currently used by KRA and what are their capabilities in terms of integrating with the e-government platform?
- b) What is the extent of KRA stakeholder's engagement regarding the integration of e-government services?

- c) What is the state of the current digital infrastructure put in place by KRA to manage their ICT driven services?
- d) What is the best approach in replacing the current SOA model with an IMS model for the successful integration of KRA's system with the e-government platform?

1.7 Significance of the Study

It was expected that the study will have broad-reaching implications for governance, economic development and citizen engagement in the digital era. The research findings were useful in establishing the existing information management systems, assessing the strengths and weaknesses of the suggested integration strategies. The study findings also formed the basis upon which suggestions for improving the existing IMS strategies can be made.

The public sector administrators can use this study in creating an enabling environment that promotes seamless service propagation as well as revenue collection. The academic sector benefited from the new knowledge regarding the integration of government services using available ICT tools. Finally, the general economy will enjoy a reduced pilferage of revenue owing to the efficiencies presented by the results therein.

1.8 Scope of the Study

This study was on investigating the application of information management system strategies in supporting the successful integration of e-government services modules for the efficient delivery of services and revenue collection - A Survey of Kenya Revenue Authority, was conducted within the republic of Kenya. Although the study has an in-depth investigation on the information management system integration strategies of the e-government, it focused on how such strategies can be deployed towards supporting the Kenya Revenue Authority. The

target population was the e-government stakeholders together with the KRA management, KRA staff and Kenyan citizens.

1.9 Limitations of the study

The study did not have serious limitations although there were some issues accessing critical information about the current systems in the government e-portal. The study faced challenges in accessing sensitive data and information due to the confidential nature of government operations and services. This was sorted out by patient surveying and diligent interviews as well as data collection. Financial resources were also a deterrent but this was sorted by effective financial management and budget realignment.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

The goal of this chapter was to review the pertinent literature that served as the study's foundation. Reviewing e-Government material from across the globe and in Kenya comes first. Subsequently, an examination of current technology adoption models was conducted to determine the most suitable theoretical framework for this study. Next, with an emphasis on the Kenya Revenue Authority, we create a conceptual framework for the proposed integration of e-government services.

2.1.1 E-government Concept

Generally speaking, e-Government falls into four primary categories done according to the entity interacting with the government. Government-to-citizen (G2C), government-to-employee (G2E), government-to-business (G2B) and government-to-government (G2G) are the four primary types. Conventionally, static, non-interactive webpages that provide information to citizens have been the starting point of e-Government development. Over time, these early projects typically expand to incorporate features for non-citizen groups including businesses, employees, and other governmental organizations interested in government services and goods. Internal government functions are undergoing business process reengineering and strategic enhancements concurrent with the provision of services targeted towards employees and other government entities. As a nation's e-Government platform develops, more features with variable levels of interaction are added in addition to static features. E-Government can be viewed as radically altering how governments handle information in order to provide better services to individuals, companies and other members of society (Kumar, 2011). Nevertheless,

despite the wide range of definitions of e-Government, each term is based on a single, fundamental idea. The application of ICT tools to the provision of public services. One of the main instruments supporting the expansion and advancement of e-Government applications is the world wide web. 192 countries have created e-government websites, according to the most recent e-Government report by United Nations' (2022). The complete implementation of e-Government will improve many governments' management philosophies and close the communication gap between the public and the government. This means that people can cooperatively take part in the process of establishing decisions and policies. This is the outcome of the belief Because governments are intricate, enormous bureaucratic organizations with a network of information silos that hinder information access and make service delivery difficult and frustrating (Coleman, 2006). E- government can also boost openness, lessen dishonest public service delivery practices, and save a substantial amount of money for both citizens and governments (Coleman, 2006).

Governments all throughout the world have accepted e-Government as a useful instrument for communicating with their constituents and other various stakeholders after realizing the advantages it offers. But in the modern day, a paradigm shift has occurred, as even governments show an equal interest in using the internet for daily operations (Zhu & He, 2002). Given that ICT is primarily used to deliver e-Government services, it is essential to comprehend IT adoption. We may expand on this information to better understand how e-Government systems are embraced and uptaken. According to Chen et al. (2009), the term "e-Government" describes how government agencies are using IT to increase their operational efficacy and efficiency in responding to citizen requests and delivering services. From posting frequently asked questions on a website to managing online requests like electronic tax or fee payments, visa processing, and more, the scope of e-Government services is extensive.

2.2 Theoretical review

This section discussed the study's theoretical underpinnings. According to Corley & Corley (2016), a theory is a collection of ideas and claims that explain how and/or why something occurs. In their study, Cooper and Schindler (2008) discovered a strong link between new technology strategy and business performance. In a similar vein, (Zahra & Covin, 1993) discovered a strong link between a firm's success and business strategy-technology. The following highlights some of the theories that are relevant to the integration of information management systems in an e-government setup with KRA as our main point.

2.2.1 Change Management Theory

Organizational leaders that foresee change and respond swiftly and responsibly succeed in the ever- changing modern business environment. But because those who start change are also the industry leaders, organizational leaders who foresee and create the future tend to be much more successful (Romanelli & Tushman, 1994). Organizational leaders should choose and apply a transformation model that will enable their organizations to withstand the forces of the external environment, as there are numerous models available for effective organizational change. Gaining the support of the organization's employees is a crucial component of the change management process. Four steps are involved in effectively managing organizational change: recognizing shifts in the broader business landscape, developing the modifications required for the organization's requirements, informing employees about the changes, and winning over employees with the arguments for the required modifications (Romanelli & Tushman, 1994). Organizational change management creates successful ways to prevent change failures or resolve challenging change projects by using performance measures such as the perceived need for change, leadership commitment, operational efficiency, financial success and communication efficacy.

According to Reiss (1993), this visible track on transformation initiatives aids in expectations alignment, communication, team integration and personnel training management. This theory clarified the procedures involved in change management and demonstrated how successful change management may result in higher revenue collection, making it pertinent to the study. To guarantee smooth operations in whatever strategy management initiatives the business undertakes to boost revenue collection. The theory tackles the issues that ensure resistance to change doesn't exist. The Kenya Revenue Authority may improve its e-government capabilities while reducing interruptions and guaranteeing stakeholder support by fusing a strong IMS integration strategy with change management concepts.

2.2.2 Systems Theory

"A working hypothesis, the main function of which is to provide a theoretical model for explaining, predicting and controlling phenomena" is how Bertalanffy (1968) defined systems theory. The most common and fundamental component of all systems is that knowledge of one component allows us to learn about another; as a result, the content of an information piece or piece is proportionate to the quantity of information that can be deduced from the information. Systems might be uncontrolled or controlled (cybernetic). Information systems are detected in controlled environments, and adjustments are made in reaction to the data. This functions as the system's detector, selector, and effector, according to Kuhn (1974). On the other hand, the laws and rules that the systems rely on to make decisions or, more precisely, the mechanism that governs how the systems' operations and transactions happen—define the selector. The detector is therefore curious about the transfer of data between systems. There are only two types of intersystem interactions: transactions and communication. Information is exchanged during communication, whereas matter and energy are exchanged during a transaction. Transactions and communication are a part of every social interaction and organization.

According to Kuhn's design, decisions have the responsibility of guiding a system toward equilibrium; transactions and communication serve as the means by which this equilibrium is reached. This idea is pertinent to the research since it facilitates the comprehension of organizations as systems. According to the notion, organizations—which are sometimes referred to as systems—interact with the external world. Within organizations, divisions collaborate to achieve a common goal. We therefore understand the Kenya Revenue Authority as a system composed of interconnected subsystems. Systems theory emphasizes the interdependence and relationships among different components. It also states that a feedback mechanism is implemented to ensure that the integration process can adapt and evolve based on changing requirements and external influences. All this must however follow a thorough audit of existing information management systems within the Kenya Revenue Authority. This is to identify dependencies, interfaces and data flows between different systems.

2.2.3 Institutional Theory

With an emphasis on the constraints that social norms, expectations and values placed on organizations, the foundational theories and concepts of institutional theory offer useful frameworks for examining how an organization interacts with its surroundings. Rather than effectiveness or efficiency as the main organizational goal, this technique is based on the idea of legitimacy (Doug & Scott, 2004). The mentioned surroundings, as shown by governmental bodies, courts, professional associations, professionals, professional standards, laws, and society values, is known as the organizational field. According to institutional theory, any organization must adapt to its surroundings. However, institutional theory does not fully check the issue that completely comprehends organizations and their environment because it ignores key fundamental features of the organizational environment and activities, such as an organization's ability to alter or adapt to its surroundings and its reliance on outside resources.

Renowned institutional theorists like DiMaggio and Powell (1983) claim that external market forces and the organizational working environment can significantly influence how official organizational structures evolve. According to the authors, early adopting enterprises' creative structures that boost technology efficiencies are legitimated by the surrounding environment. These developments gradually gain legitimacy to the point that rejecting them is perceived as irrational and heartless. By now, both new and old companies will adopt the structural shape even if it doesn't improve efficiency (DiMaggio & Powell, 1983). Because it explains how the organizational and external environments might objectively affect how departments interact with one another to improve revenue collection performance, institutional theory is relevant to the research.

2.2.4 Technological Determinism Theory

According to the reductionist theory of technological determinism (TD), technology is a social structure or a force that propels change. TD modifies a variety of organizational elements, such as the modes of operation, reporting lines, organizational culture and structure. The two primary hypotheses on which technological determinism is predicated are the following: the idea that a society's technological foundation is the primary factor influencing all social patterns and the idea that technology advancement is the primary driver of social change. According to critics like Chandler (2000), in addition to technology concerns, other factors also exert pressure. These factors include but are not limited to political issues, class interests, economic pressures, educational background, and general views.

TD has a long and controversial history in the social sciences in general and organization studies in particular. TD's critics offer a range of claims, including that social structures shape technology and vice versa, that technology is socially determined, and that the primary element influencing any particular technology's influence is its implementation, which is socially

decided. The TD argument is ever-present in modern capitalism due to the rapid development of new technology. This widespread presumption that the invention of the general public determines its social characteristics, social structure, and history. The concept suggests that societal progress follows an unavoidable path propelled by mechanical growth. It is acknowledged that American humanist and financial analyst Thorstein Veblen (1857–1929) is credited with coining the phrase "mechanical determinism." This hypothesis also aligns with the research conducted by Marshall McLuhan, who asserts that we are experiencing an unprecedented time of invention (McLuhan & Logan, 2016). This argument is supported by the idea that people shape their instruments, and that human groups' social characteristics are shaped by the apparatuses.

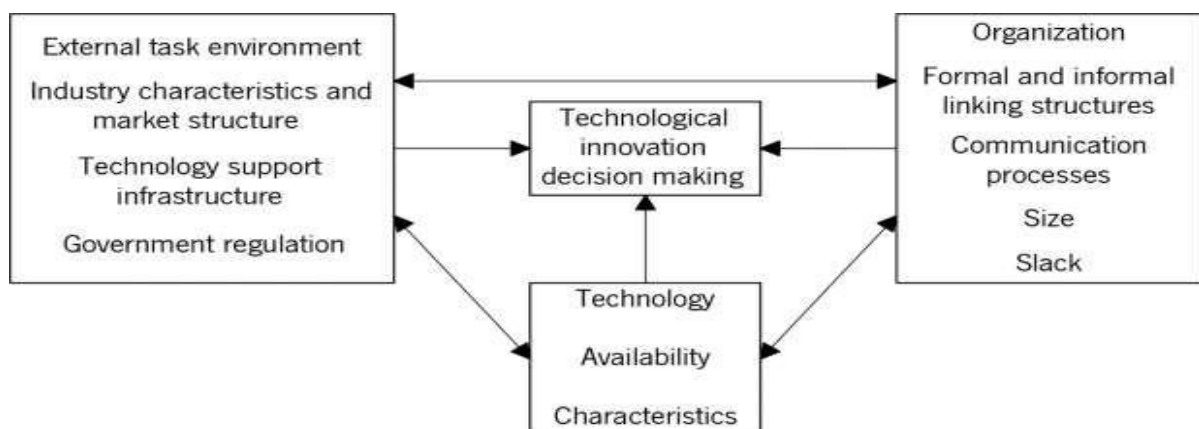
Innovations in technology have made life more convenient by enabling people to conduct any kind of transaction. Competitive advantage is increasingly being linked to information and communication technologies (ICTs) (Rastrick & Corner, 2010). The notion known as RBV has been linked to studies looking into how data innovation affects business execution. The core claim of this argument is that an association's unique, important assets determine its competitive advantage. IT as a lucrative resource will improve business operations (Liang et al., 2009). The Resource-Based View (RBV), according to Wiu and Chiu (2015), argues that IT advancement skills are crucial resources for aggressive execution. It is demonstrated using three different types of applications: intra-association, between association, and IT unit. The three types represent a cross-temporal transformative idea. Because it acknowledges the significance of technological innovation for organizations and society, the technological determinism theory is pertinent to this subject. This study aimed to determine information systems strategies to promote the integration of government e-services, in line with the view that ICTs bring about revolutionary shifts in society.

2.2.5 Technology, Organization and Environment Model

Tornatzky and Fleischer developed the TOE framework in 1990. It outlines three entrepreneurial setting components—technological context, institutional situation and environmental background affect how a technical advancement is embraced and put to use. Both internal and external technologies that are relevant to the company are referred to as being in the technical context. This includes both the range of externally accessible technology and the current practices and equipment employed within the organization. Organizational context refers to details about an institution's size, function and organization structures. The sector, market, competitors and relations with the government are all parts of the business environment that a company operates in (Tiago & Maria, 2010).

Figure 2.1

Toe Model



Source: Theory/Model: TOE

The TOE framework provides an effective analytical method for examining the acceptance and integration of various IT types of innovation in its original form, which was later adapted to be utilized in IT studies conducted. The TOE framework has a solid theoretical underpinning, consistent empirical support and the capacity to be applied to IS innovation domains, however the precise aspects disclosed within the three perspectives may differ between investigations (Tiago & Maria, 2010). The adoption of ICT-based procurement practices in state businesses is influenced by technical innovation, encompassing the organizational, technological and environment situations. These factors affect the level of automation, the types of procurement systems to be employed in organizations, the ICT infrastructure's makeup and how e-procurement is utilized within the organization. Using this theory, the research will try to determine how information management systems affect the efficient integration of various public e-services in the e-government focusing on the KRA as a case study.

2.3 Empirical review

2.3.1 Electronic Tax Systems

According to Wasao (2014), a web-based infrastructure known as the electronic tax system enables taxpayers to obtain tax services online. Among these services are filing tax returns, obtaining a tax identity number, and registering an application for a certificate of payment and compliance. The United States became the first country to use electronic tax systems when tax returns could only be filed electronically by the Internal Revenue Service in order to receive refunds (Muturi & Kiarie, 2015).

Maisiba and Atambo (2016) assert that the e-tax system facilitates faster access to tax services without necessitating a physical visit to the tax authority's office, thereby improving tax compliance location. A system that is user-friendly, safe, dependable, has an easy-to-use payment option, and delivers a range of services is what is shown to increase voluntary tax compliance (Haryani et al., 2015). Many nations, including Australia, Canada, Italy, and the UK, have implemented electronic tax systems in recent times.

An entirely automated and secure web-based application architecture for controlling home costs is offered by the KRA Online platform. According to Waweru (2013), it facilitates web-based PIN enrollment for citizens, return documents, installment enrollment for charge installments, and status requests with ongoing record-checking. As more nations adopt information technology for tax management, the deployment of e-tax systems has become essential. According to Davis (1989), TAM implies that attitudes toward a specific system, which in turn affect a person's inclination to utilize it, have an impact on taxpayer adoption behavior. Thus, taxpayer acceptance of any given system could be ascertained by the intent behind a particular

conduct. Putting in place an electronic tax system is essential for enhancing tax compliance as well as cost savings and taxpayer convenience (Guriting & Ndubisi, 2006).

2.3.2 M-Service Integration

In many developing nations, mobile phone usage for payments and banking in particular is growing. Through a mobile application, taxpayers (Clients) can get efficient services via the Kenya Revenue Authority's m-service platform. Short Messaging Services (SMS) and USSD Information Services make up the two halves of the KRA m-service. These services provide taxpayers with a method for using straightforward SMS and USSD code inquiries to access specific information domains in the Kenya Revenue Authority database (Kamau, 2014). Through the m-services, taxpayers can pay custom services such license fee payments, import and export duty determination, and asset transfer fees in addition to their domestic taxes. Within the framework of this investigation, a service is defined as a collection of operations provided by government agencies to all relevant parties, such as other government agencies, corporations and individuals. Numerous conventional and electronic routes are available for the delivery of these services. The words "service" and "integration" make up the term service integration. Many e-government academics have offered a variety of definitions for electronic services. The three primary elements of this definition are the service receiver, the service provider, and the channel used to deliver the service. For public eservice, for instance, government agencies and organizations are the service providers. Businesses, citizens, and service providers make up the service recipients.

The internet serves as the primary delivery route for e-services, with other conventional channels like phones, call center, Television, cell phones and public kiosks also taken into account. However, in order to provide more effective and efficient e-services, cooperating government entities and agencies must integrate e-services across levels and branches.

Integration is a widely used term that refers to increasing an organization's effectiveness, efficiency and competitiveness. The choosing of innovation actually affects the broad citizens' obligation consistency levels. The justification for this is that the KRA successfully implements its ICT I-Tax system and the vast majority of its citizens are happy with how it was done. According to this theory, a significant portion of the populace believes that innovation has made it easier for them to essentially consent to assessment legislation. Finally, the analysis suggests that this KRA innovation is sustainable in terms of improving change consistency.

2.3.3 Enterprise Information Management System

An arrangement of segments that support data collection and transmission with the information management system as a tool used with programming, hardware, center product and organ product assistance. An information management system (IMS) is essentially any software architecture that makes information gathering, storing, organizing, and distributing easier. An organization's information can be managed holistically with integrated information management. It includes every facet of managing information, from gathering and storing it to retrieving and analyzing it to sharing it. Information management procedures should be made more efficient, accurate, and consistent. The Endeavour Information System (EIS) is an excellent tool for research and discovery that provides insightful and fortunate data for an organization. Venture Information Systems are seen as a targeted requirement by many organizations, especially those operating in a global and increasingly competitive environment. Managers must consider the significant implications that these frameworks have on an association's ability to compete (McKinnon et al., 2007).

Businesses have been integrating their activities with new technology on a constant basis to attain operational effectiveness and efficiency. In an effort to unify all corporate operations under a single system, numerous companies have recently made investments in enterprise

resource planning (ERP) (Beheshti & Beheshti, 2010). Systems for managing enterprise information are essential to businesses. Businesses heavily depend on their EIMS to execute and integrate their processes throughout the company and their business network. This theory can be utilized to good effect in integrating electronic government services thereby greatly increasing seamlessness in service delivery. Supply chain management (SCM), customer relationship management (CRM), and enterprise resource planning (ERP) systems are examples of enterprise systems that offer a high level of computer automation to support an organization's numerous important business operations, according to Türetken et al. (2019). It is imperative that the emphasis be shifted from "operational" business activities to "compliance" activities grounded in risk analysis and intelligence-driven decision-making demand for enterprise information infrastructure (KRA, 2012). According to Awais et al. (2012), associations worldwide began to recognize the overwhelming need for information structures in the business sector throughout the course of the following several decades. Ignoring the importance of favorable circumstances and the potential to improve business execution through such an endeavor was a real risk. It was quickly noted that an IMS can make a financially responsible company more competitive. The decision to use information development to support the business framework can strengthen bonds and lead to a rise in shared financial transactions. The constant influx of resources into enterprise-wide organizational frameworks is a crucial responsibility that could affect all company frames. The effect of putting together major business systems on an association's long-term financial performance was examined by Gary (2017). According to this idea of the system, different services from different departments are combined into a seamless service that is focused on user services. A "one-stop" portal offers a full menu of services that are customized to the user's profile. An alternative is to group similar

services together to create a single, cohesive offering. For this, there will need to be some degree of intra- departmental coordination and systems alignment.

When implementing service integration to e-government initiatives through the main site, there are several crucial considerations that need to be made in order to provide efficient, effective, competitive, and integrated services. In this context, availability, accessibility, customization and personalization, collaboration, and coordination may be important challenges. Although these titles may indicate varying degrees of intensity or focus, they are all related to the endeavors made to eradicate boundaries between services supplied by various divisions. Service integration efforts can be made across different organizations and agencies that provide related services or inside a single organization that offers a variety of services.

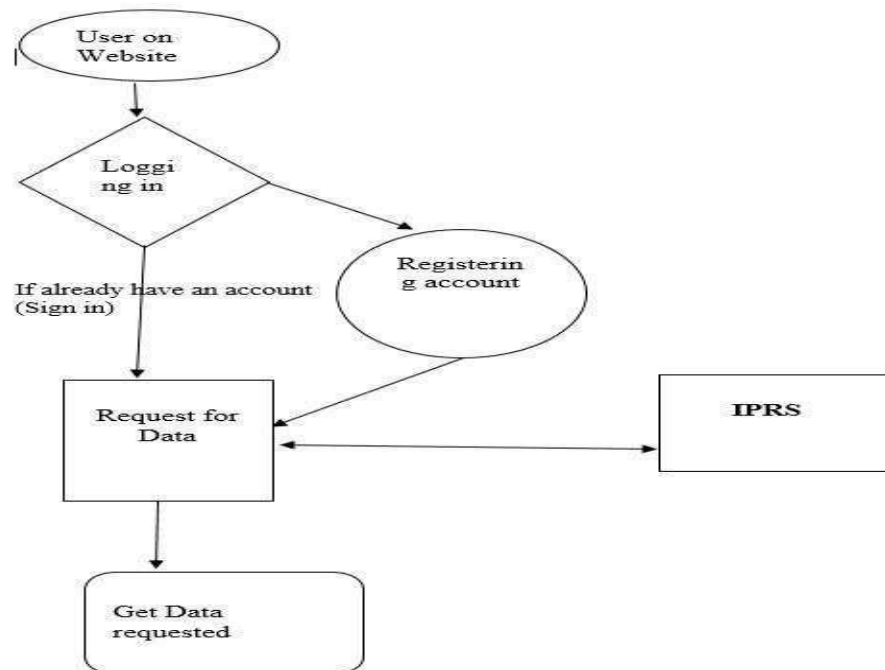
2.3.4 E-Government Integrated System using SOA

The process of creating business applications with software components known as services is called service-oriented architecture, or SOA. Each service has a unique purpose, and they can communicate across several platforms and languages. The Service-Oriented Architecture approach facilitates information collection, interaction, and customization of information to meet the needs of individual users. Additionally, it can facilitate the contextualization and smooth flow of information, which will enhance the exchange of government information and, as a result, increase the provision of services to residents. SOMA was used in the development of the proposed SOA e-Citizen Model. Service-oriented modeling and architecture, or SOMA, is a methodology for modeling applications with service-oriented architecture (SOA). SOMA is an extension of traditional component-based and object-oriented analysis and design approaches, an end-to-end methodology. Three main phases form the foundation of SOMA: Acknowledgment: SOMA Identification locates components, enterprise flows and possible services.

The proposed integration system's SOA components, services and procedures are all included in the identification step. The procedures used to guarantee that the citizens receive the services are shown in the following chart.

Figure 2.2

Current e-Citizen IPRS Data Request Flow

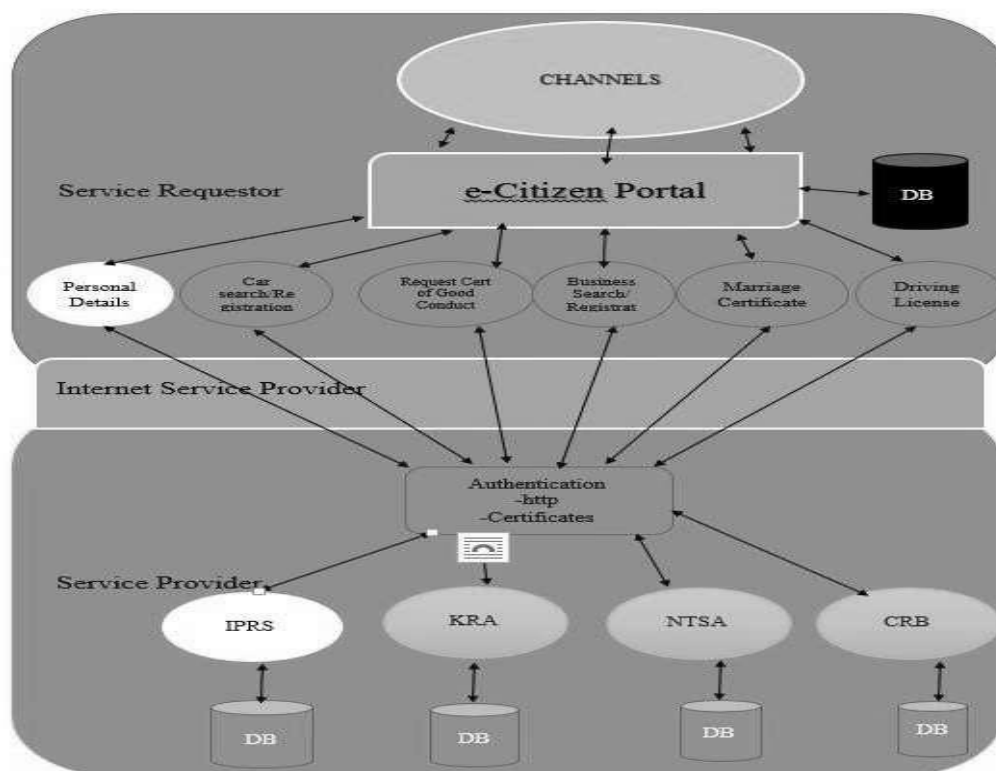


Due to the necessity of manual interventions to ensure the flow is completed, inefficiencies, effort duplication, and redundant data entry have been identified as difficulties in the current system and flow.

Data is retrieved directly from the IPRS database via the IPRS Application since the e-Citizen portal and the IPRS system are integrated via a SOA-based integration as part of the solution. This is accomplished by sending service queries and expecting service responses via web services and SOA application servers.

Figure 2.3

The Proposed Kenya e-Citizen SOA Architecture

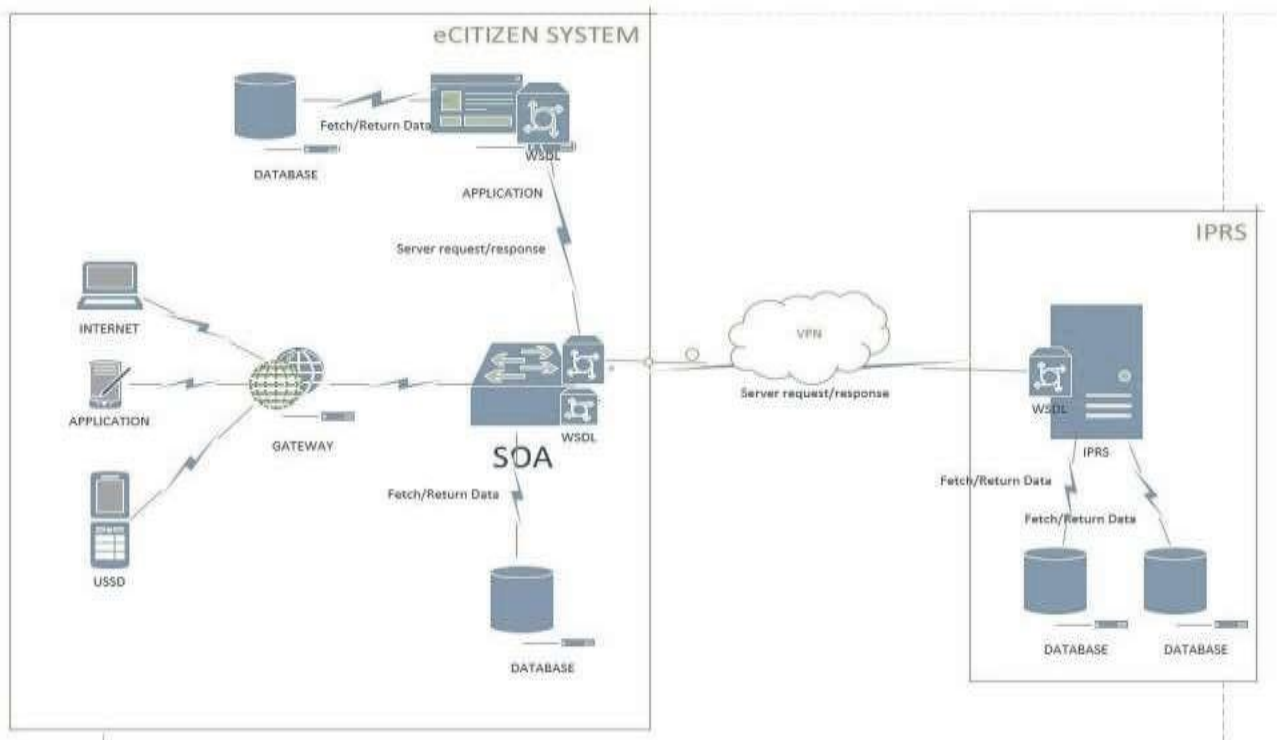


SOMA specification Decisions about service exposure are made via specification, which also identifies the services and enterprise elements needed to implement them. The proposed e-Citizen system will be implemented using the SOA model and web services, which have an intuitive user interface, in order to integrate the various applications and systems into an integrated system where businesses and citizens can access services and information in a single one stop system, one secure authentication protocol, and other features. Web service definition language protocol will be used by the SOA model as a language of communication for both service requests and responses between the applications. Understanding - SOMA Decisions about realization are captured by realization.

For the E-Citizen site and Integrated Populations Registration System, a reference architecture was used to create a schematic of the individual components, which gave an overview of the suggested SOA architecture model (IPRS).

Figure 2.4

Proposed e-Citizen SOA integration Model



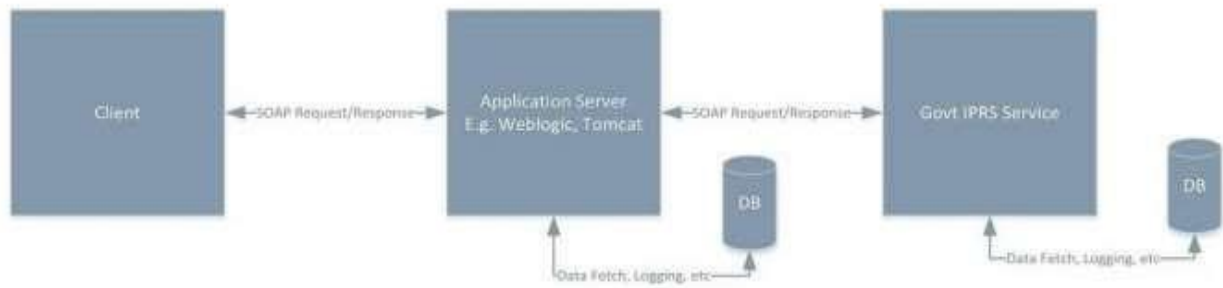
SOMA provides validation at every stage of the design process, guaranteeing a SOA business infrastructure that is completely integrated, adaptable, and responsive. Through the usage of SOA, SOMA helps businesses better understand their business processes, providing them with the tools they need to expand and thrive.

The proposed e-Citizen system will be implemented using the SOA model and web services in order to integrate the various applications and systems into an integrated system where citizens and businesses can access services and information in a single one stop system, one secure authentication protocol, and an easy-to-use interface. What a Web Service Is Language Protocol will be used by

the SOA model as the medium of exchange for requests and answers between the Applications. The parts and their relationship are depicted in the following diagram.

Figure 2.5

High Level e-Citizen SOA integration Model



2.3.5 Information Management System Integration Model

Integration is viewed as a novel development within the integration framework rather than as a collection of distinct techniques created for a particular application. It is seen as an information systems process with a particular business objective. Since the framework is focused on data generated in the business functions and the integration of information flow across the business activities, the key information functions provide the framework for describing the present business functions and their corresponding integration. The five phases of the integration framework offer a step-by-step procedure for the analysis and implementation. The framework's objective is to offer a process for integrating e-government information systems. The steps should be completed in order, as each step needs the data and analysis input from the stage before it.

The integration need stage is the initial phase. This phase is all on figuring out the e-government plan, researching information systems, and exploring e-service environments. The main purpose of the initial phase is to identify the essential integration needs.

The stage of function integration is the second. The next step is to create an information system integration plan based on the requirements derived from the e-government strategy after the important integration requirements and the e-government strategy have been defined. Originally from Suh's engineering axiomatic design methodology (Suh, 1990), the "Decomposing-and-Mapping" method is applied here in a novel context to create an integrated e-government information system. At the conclusion of this phase, an integration plan will be created in relation to each major integration requirement.

Using data analysis techniques, the framework's third stage aims to develop an integrated e-government information system. Validating the integration plan while taking the information systems' data flows into account is necessary. Examining the information flows in the integration plan and locating any information flow obstructions at the plan are the assigned tasks. The specification for the integrated system can be built based on the information flows and data structures of the e-government information systems.

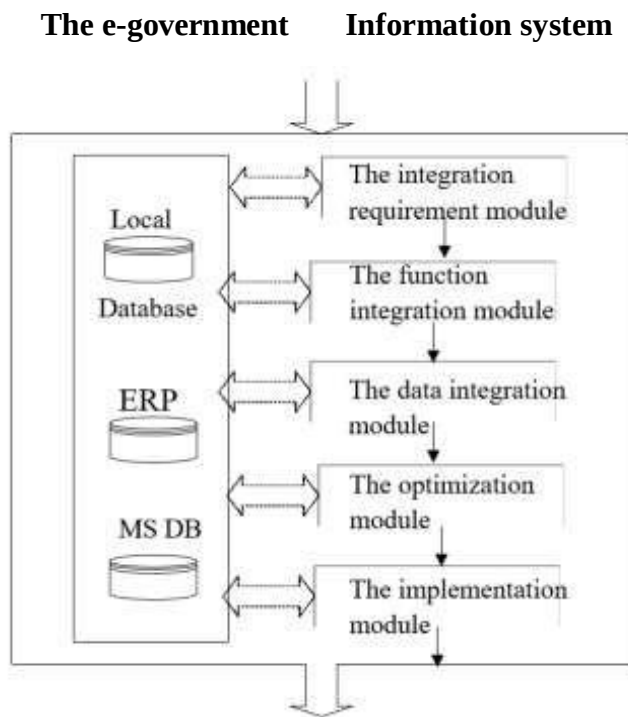
We carry out an integration optimization exercise in the fourth stage. In order to achieve the strategic goals of integrating the e-government information systems, alternative technologies will be employed here to improve resource allocation. How to balance the various contributions of distinct software components and the government e-services is one of the challenges encountered during the integration process. The optimal solution in accordance with the specified criteria can

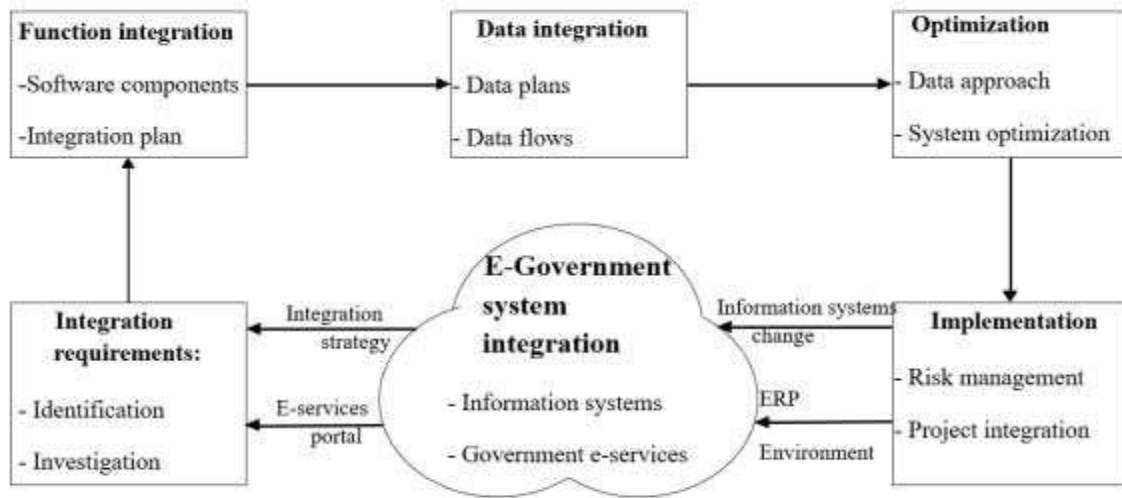
be suggested by using the goal programming techniques. The suggested approach took into account all software components and their interdependencies while acknowledging this distinction in order to provide the best possible solution in light of the e-government goals.

The step of integration implementation is the last one. It entails organizing and carrying out the integration project's real execution, which includes project management, e-service specifications, risk management, and human resource management.

Figure 2.6

Information systems integration model





2.4 Conceptualization

2.4.1 Information systems

Information systems are viewed as the backbone for collecting, storing, processing and analyzing vast amounts of taxpayer data to impart information. This data is critical for KRA's operations, decision-making and service delivery. An analysis of research conducted by Awais et al. (2012) revealed that associations worldwide began to recognize the astounding need for information structures in the business sector over the course of the following few decades. It was very feasible to overlook the importance of favorable conditions and the possibility that such an endeavor would increase business execution. Supervisors must consider the crucial implications of these frameworks on an association's ability to compete in such a situation (MacKinnon, 2008).

Türetken et al. (2019) assert that a high degree of computer automation is provided by information systems, such as supply chain management (SCM), customer relationship management (CRM), and enterprise resource planning (ERP), to support the various important business functions of the organization. The necessity to refocus attention from "operational" business activities to

"compliance" activities based on risk analysis and intelligence-led decision-making is what drives the need for information systems (KRA, 2012). Corporates have been integrating business activities into their operations to achieve both effectiveness and efficiency over the years by implementing new technologies. To combine all company operations into a single, standardized system, numerous businesses have made investments in enterprise resource planning (ERP) in recent years (Beheshti & Beheshti, 2010). Information systems, or ISs, are an essential part of any enterprise. Businesses heavily rely on their IS to integrate and carry out their corporate network and internal procedures.

In the context of KRA's e-government services integration, the conceptualization of information systems revolves around 4 core pillars. These are Data-centric, User-centric, Application development and Process-centric perspectives. The data-centric perspective views data as a strategic asset while the user-centric perspective views taxpayers as customers. The Application development perspective involves creating user friendly applications and interfaces to put the preferences and needs of the client first. Finally, the Process-centric perspective views E-Government as a Business Transformation. Information systems are seen as enablers for streamlining and automating core business processes, such as tax filing, payment, assessment, and audit.

The information systems conceptualization for KRA's e-government integration is a holistic approach that combines data-centric, application development, process-centric and user-centric perspectives. By addressing all 4 dimensions, KRA can build a robust and effective e-government infrastructure that supports its mission of efficient and transparent revenue collection.

2.4.2 Digital Infrastructure

This is the foundation of hardware, software, networks and data centers that enable the operation and delivery of e-government services. It provides the underlying technological capabilities for data storage, processing, communication and access across different KRA systems and services. It has 4 major components associated with it. We have the Network Infrastructure which entails reliable internet connectivity to KRA offices and taxpayer locations, Load balancing and redundancy to ensure continuous service availability and secure private and public networks. Then the Hardware Infrastructure which runs the servers (physical or virtual) for hosting applications, databases and services, Storage systems (SAN, NAS) for managing large volumes of taxpayer data, Networking equipment (routers, switches, firewalls) for data transmission and security.

The third entity is the Software Infrastructure which contains Operating systems (Linux, Windows Server) for managing hardware resources, database management systems (Oracle, MySQL, PostgreSQL) for storing and retrieving data and web servers (Apache, Nginx) for delivering e-government services over the internet. Then finally we have the Data Centers which offer Secure, climate-controlled facilities for housing servers and other infrastructure components which have redundant power and cooling systems to prevent service disruptions.

A robust and reliable digital infrastructure is the foundation upon which effective e-government services are built. For the KRA, a well-designed and implemented digital infrastructure is crucial to achieving its goals of streamlined tax collection, enhanced transparency, and improved taxpayer experiences. By prioritizing and investing in its digital

infrastructure, KRA can position itself as a leader in e-government service delivery, ultimately benefiting both the organization and the taxpayers it serves.

2.4.3 Stakeholder Participation

Information Management Systems (IMS) are critical in integrating e-government services in Kenya and stakeholder participation is a key factor in the successful implementation of these systems. The active involvement of stakeholders is crucial for the successful implementation of information management systems in e-government services. Key stakeholders include government agencies who need to collaborate and share information to provide integrated services. Clear communication and coordination mechanisms are essential. Another essential stakeholder are the citizens who are the primary users of e-government services. Their feedback and input are valuable in designing systems that meet their needs and expectations. The private sector can also provide expertise and resources in developing and implementing IMS integration solutions. Engaging them in public-private partnerships can be beneficial. Finally, we have the civil Society who can advocate for transparency, accountability, and inclusivity in the design and implementation of e-government services. The KRA should regularly engage with taxpayers, tax professionals and other stakeholders through various channels to gather feedback and improve service delivery. Information systems can play a very pivotal role in integrating e-government services in Kenya. By employing strategies such as standardization, data analytics, user-centered design and robust security measures, the government can enhance the efficiency, effectiveness and accessibility of these services. Active stakeholder participation is essential throughout the entire process, from design to implementation and evaluation, to ensure that the systems

meet the needs and expectations of all users. The Kenya Revenue Authority's experience serves as a testament to the potential of IS in transforming government service delivery and improving citizen engagement.

2.5 Conceptual Framework

A conceptual framework is a tool used in research to help a researcher communicate and obtain understanding of the subject being studied. It was used in the study to provide a way to approach a concept or way of thinking, or to suggest possible paths of action.

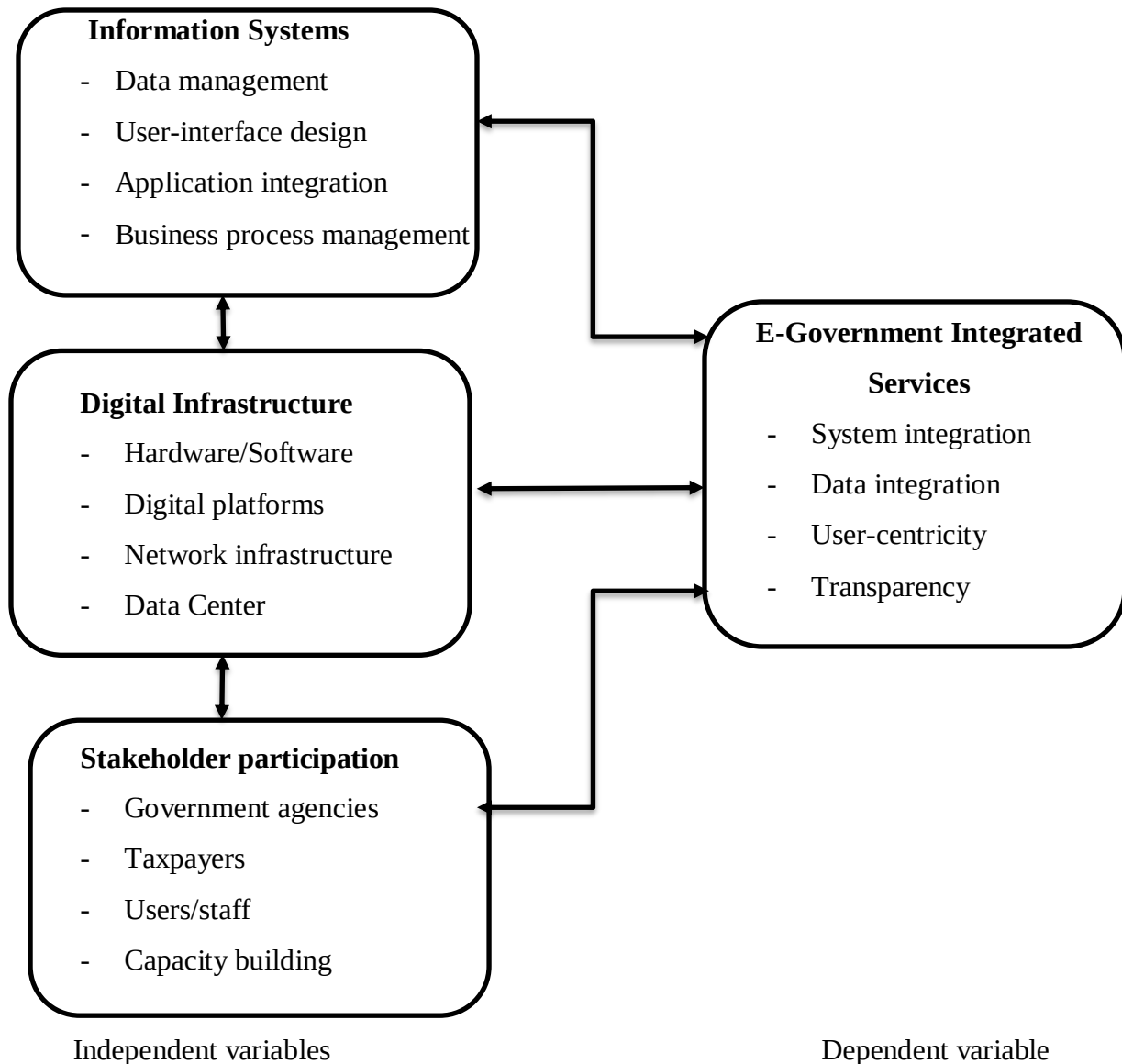


Figure 2.7

Source Author (2024)

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

A summary of the research study's methodology was given in this chapter. It includes the procedures used for gathering and examining study data. It also includes the following subsections: research design, study population, cross-section procedure, data gathering procedures, and data analysis techniques. The study structure for the primary areas of attention was presented in this chapter.

3.2 Research Design

The specific strategy used to carry out the investigation is referred to as the research methodology. It ensures that the research is pertinent to the subject and should make use of economical techniques (Kothari, 2004). It may be described as a range of techniques or protocols that a researcher decides to use. It offers an illustration of how data gathering and analysis ought to be carried out in order to meet the study's objectives. The researcher should select a method that is valid, trustworthy, reliable, and cost-effective when responding to inquiries (Kumar, 2011). Case studies, cohorts, cross-sectional studies, descriptive studies, exploratory investigations, correlational studies, and observational studies are a few types of study designs (Kumar, 2011). In this study, a descriptive research design and a case study approach were used. The goal of the descriptive research approach is to gather accurate and relevant data on the development's current state and using that data, to produce a trustworthy general assessment. Because the study approach allows for the least amount of bias and the maximum level of information reliability, it was selected for this

investigation. This approach is effective when a study seeks to draw conclusions from a larger group (Kothari, 2004). This method was good due to pre-existing conditions or relevant occurrences. In order to facilitate complete integration with other e-government services and platforms, the study examined the information management systems of the Kenyan Revenue Authority using a case study research methodology. Because a case study may amass comprehensive data on a topic, the study decided to use one. The research methodology is efficient and advantageous as the study intends to collect information on information management systems methods to promote the integration of e-government services, with an emphasis on the Kenya Revenue Authority and also because case studies are more in-depth. A case study can help a researcher gain a comprehensive understanding of the research setting and methodology, according to Morris and Wood (1991). Case studies are a great way to examine current theory since they can raise issues related to "what," "how," and "why." Researchers might use case studies to bolster their own theories.

In research studies, there are two different kinds of standards: "phenomenological," sometimes referred to as "positivist," sometimes known as quantitative analysis and qualitative analysis. In line with Collis and Hussey (2014), the term "qualitative analysis" encompasses a wide variety of enlightening research methods, the majority of which are employed in the social sciences. Understanding social and human behavior requires analyzing and taking into account different points of view, which is inherent to phenomenology. Conversely, the positivist (quantitative) approach focuses on mensuration phenomena and is described as objective in nature. It entails applying applied mathematics assessments as well as compiling and evaluating numerical data. Styles, procedures, and weights that incorporate sensible numerical or quantitative data are all part of quantitative

analysis. The philosophical presumptions that underpin all forms of inquiry are the fundamental differences between the phenomenological and positivist approaches. According to Mugenda & Mugenda (2003), every method asks for the creation of a body of data regarding the occurrence.

3.3 Target population

The component of a study that a researcher takes into account is a population (Kothari, 2004). A census enquiry is a thorough listing of every individual in the population. A census survey is a study that is conducted on the complete population and offers the maximum level of accuracy. The individuals, institutions or organizations that comprise the sample group where the data are collected (Kumar, 2011). Cooper and Schindler (2008) defined a target population as a legitimate list of only individuals of interest to the study. Generally, the entire set of cases, objects, publications, people and things with necessary yet distinctive qualities as determined by the study is referred to as the target population (Mugenda & Mugenda, 2003).

Bordens (2008) asserts that the analyst should have enough participants to construct a trustworthy study and should abstain from anything excessive. Kenya Revenue Authority has close to 8,000 employees working in different departments. Therefore, part of the population of the study was 8,000 staff of KRA. The population of interest for this study comprised of senior, middle and lower level management employees in KRA's finance, operations and ICT departments at Nairobi head-office. The mentioned units are directly involved in the e-government online services. The total number of management employees in these departments are 256. Mugenda and Mugenda (2003) suggests a sample size of ten to thirty percent because the study is primarily descriptive in

nature. To avoid sample bias, Kothari (2004) advises that a sample group be precisely large enough to adequately reflect the characteristic features of the accessible population.

The other part of the population of interest was e-government officials and external stakeholders comprising of normal tax payers and private corporations. Private corporation participants were picked from the finance and human resource departments of 2 companies; 1 bank (National bank) and 1 supermarket chain (Naivas supermarket). Normal tax payers were drawn from Nairobi's CBD. E-government officials were from the Ministry of Information, Communication and the Digital Economy in Kenya agencies. The selected target population provided sufficient data for the study.

3.4 Sampling techniques and sample size

Sampling, as defined by Fraenkel and Wallen (2000), is the process of selecting study participants from the population sample, ensuring that findings from the study may be applied to the study participants as a whole. The respondents were chosen by the researcher using a purposeful random sampling. It is a sampling approach in which the participants are chosen depending on the goal of the study, i.e., depending on some attribute (Patton, 1990). Because it assured that every sample had a fair chance of being picked and made it possible to estimate random errors, random sampling is utilized.

A good sample, according to Mugenda & Mugenda (2003), is between 10 and 30 percent of the population under consideration. The formula to scientifically derive the sample from the target population is illustrated here. $n = \frac{NC^2}{C^2 + (N-1)e^2}$

where n = sample size, N = size of target population, C = coefficient of variation (0.5), e = error margin (0.05)

Substituting these values in the equation, estimated sample size (n) was:

$$n = 256(0.5)^2 / \{0.5^2 + (256-1) 0.05^2\}$$
$$= 72.11267605633803$$

The sample size was 72 respondents.

Table 3.1*Sampling Frame*

Population	Total Number	Sample
Low level managers	39	11
Middle level managers	102	29
High level managers	115	32
Total	256	72

3.5 Data collection methods

The study used a combination of interviews and structured questionnaires to collect data. The direct interviews were useful because they allowed for flexibility, ensuring thorough data collection and the interviewer may guide the interviewees in case they are having trouble responding to a question. The design of the to-be-used questionnaires was geared toward capturing respondents' perspectives on the subject matter of the study. The interview guide was used to gather data from the senior management of the service providers (KRA staff and E-government officials) and service requesters (corporates and normal tax payers) and the structured questionnaire collected data from the other relevant service provision managers (KRA and e-government). Data gathering was methodical and properly supervised. The surveys were sent after they had undergone a pilot test for accuracy and correctness by six non- participant responders from tax agency firms. There were separate sections of the questions for every specific subject that needs to be looked at. There were both open-ended and closed-ended questions. This was due to the necessity of objectively understanding user behavior. If additional information was required based on the volume of data obtained from the survey, there was a follow-up round of questionnaire distribution for clarification.

3.6 Instrumentation

3.6.1 Pilot study

Pilot studies are the first stage of any research project since they aid in the planning and modification of research instruments. Feasibility studies are often conducted in many target areas. It makes sense to say that before any significant study begins, carrying out some piloting or a small-scale research aids in determining whether carrying out a more thorough study is feasible (Thabane et al., 2010).

A small-scale trial was conducted to evaluate the credibility of the research and determine its likelihood of success or failure. The sample size was thoroughly examined in light of the predetermined goals and tested using suggested and trustworthy measuring devices. Before any data was gathered, a pre-test was carried out to ensure that the survey instrument was functional. Ten tax agency employees, from Dennykins and Associates, provided data for the project. By examining the clarity of the research instruments, it assesses the importance of the study objectives. Additionally, it offered the researcher a rough sense of how long the study will take to finish. The pilot project helped to lessen the likelihood of errors while also saving a significant amount of time. An appropriately planned trial was absolutely required because the validity of any investigation is crucial beforehand.

3.6.2 Validity

An assessment's validity was evaluated by how well it represents the desired result. It was concerned with the accuracy of the representation of the factors being studied. The research questionnaire took advantage of both face and content validity (Borg & Gall, 2007). In order to improve the finalized questionnaires for the actual research, the findings of the pilot study were used to restructure the questionnaire by adding the incomplete information, eliminating extraneous questions and rephrasing questions that the participants might find unclear. The

technique's shortcomings and biases, as well as any potential effects they may have on the research, are to be found during the validation stage (Saunders & Rojon, 2012). Any statistical test cannot be used to determine validity. All validity checks were based on the study's opinion and opinions.

3.6.3 Reliability

The following was used by the researcher to evaluate the dependability of the research tools: Giving the very same instrument to the exact group of participants twice served as the start of a test-retest measurement. The consistency between the two administrations served as a gauge for the instrument's dependability.

Lastly, the researcher used internal consistency proportions to evaluate reliability. The queries were confidently divided into two groups, when an instrument has a sequence of designs designed to mimic a similar build. The two sets of enquiries related in a part-to-part reliable manner.

3.7 Data Analysis

Statistical techniques that are both descriptive and inferential were used to analyze the data. Prior to the analysis, all surveys were properly evaluated and confirmed following fieldwork. After the data was modified, SPSS was used for coding and tabulation. The study used both quantitative and qualitative techniques to interpret the data. The qualitative technique examines and rates the textual content. Diagrams like tables and charts are used in the quantitative technique. The data was initially checked for misunderstandings and commission mistakes.

The gathered information was thoroughly examined, checked and recorded. It was then quantitatively coded and evaluated in accordance with the results to produce descriptive statistics. Inferential analysis came after a thorough descriptive study. The association between integration strategies, technological infrastructure and stakeholder participation and

the integration of e-government services will be established using inferential analysis. Here, using the Pearson's product technique, the research conducted a correlation analysis to evaluate the strength of the association between the integration of e-government services and its related variables.

3.7.1 Correlation Analysis

The above-mentioned quantitative variables were examined to see if there was a linear relationship using the Pearson's coefficient. There was some evidence of multi-collinearity among the explanatory variables since the correlations between the explanatory factors were strong enough to include all of the variables in the subsequent regression analysis.

Multiple regression analysis was used to focus the investigation largely on the relationship between the dependent and independent variables. The following is how the multiple regression analysis is expressed mathematically: The relative significance of each of the three components in relation to the changes in motivation was assessed using a multivariate regression model and the resulting regression model was as follows:

$$Y = \beta_0 + b_1X_1 + b_2X_2 + b_3X_3 + e$$

Where:

Y = was the value of the Dependent variable that was being explained (integration of e-government services)

β_0 = Y-intercept or Constant Term

$\beta_1, \beta_2, \beta_3$ = are the Slopes for X_1, X_2, X_3 (Beta coefficients)

X_1 = first independent variable that was explaining the variance in Y (Information Systems)

X_2 = second independent variable that was explaining the variance in Y (Digital Infrastructure)

X_3 = is the third independent variable that was explaining the variance in Y (Stakeholder participation)

ϵ = Constant error

The response or dependent variable Y served as the starting point for the model's contents, which is the variable of interest in the equation then the Y -intercept β_0 , which correctly anchored the regression line. The independent explanatory variable X , which has a considerable impact on the answer variable, is the other important participant. Except for the residual error 'e', they are all quantifiable, which is an unmeasured variable.

3.8 Ethical Considerations

Privacy, secrecy, sensitivity to cultural diversity, gender and anonymity are ethical considerations for the research. All responders got adequate and detailed explanations that make the purpose of the study apparent. Before administration of the questionnaires, permission was sought from the relevant authorities; NACOSTI and KRA. Before receiving approval via Ethical Clearance Certificate No. CIS-3-1585-1/2022, the project was initially presented to KeMU's department of computer science. The National Council of Science, Technology, and Innovations (NACOSTI) approved the researcher's request for a permit to perform the research after receiving application number. License No: NACOSTI/P/24/37105.

The researcher made clear the true goal of the study and provided all relevant information so that the participants can decide for themselves whether or not to engage in the research. Throughout the course of the study, participants were guaranteed of the protection of their identity and privacy. Additionally, there was no place in the questionnaire where participants are required to write their names or the names of their institutions. They had the peace of mind that the data they provided was only being utilized for that reason.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

In order to promote the integration of e-government services with Kenya Revenue Authority, this chapter examined the analysis, interpretation and presentation of data gathered on the information management system methods. Results from the structured questionnaire and interview guide were used in this study. From the interview guide research tool, which was created in accordance with the study's goal. The 7 KRA departmental commissioners or a representative from each and 2 senior officers from the e-Government Directorate, office of the ICT Secretary in charge were the study's primary targets. A response rate of 75% was obtained from the interviews, which were planned for the study and used to complete the first phase of the investigation. The researcher physically visited each participant to plan interview times and remind them of them, which helped to achieve the high response rate. 50% of respondents, according to Mugenda and Mugenda (2003), is considered adequate for analysis and reporting. This response rate was quite good and typical. To present the structural questionnaire data, frequency tables, percentages, averages and standard deviation were used. A pre-test on a sample population that was comparable to the target group was carried out to assess the reliability and validity of the results. Items that were inappropriate for assessing the variables were changed to enhance the study instrument's quality, hence boosting its reliability and consistency. The dependability of the instruments was calculated using the information gathered from the pilot research. The items under study that measured the variables

were described using descriptive statistics. The results are then reported in the following subsections as tables.

4.2 Interview guide

4.2.1 General Information

Here, thematic analysis was used to analyze the responses from the interviewees. The collected data was transcribed and then coded to identify key themes or patterns related to the effectiveness, challenges and strategies of information management systems integration at KRA. The researcher was to determine how long the interviewees had worked for KRA. It was found that the respondent who had worked there the longest had been there for 18 years, while the respondent who had worked there the shortest had been there for 7 years. This demonstrates that the respondents were trustworthy enough to provide adequate data on the study's subject. According to the study's findings about the interviewees' involvement in strategy formulation created the first draft of the plan at the departmental level. The study's aim was to learn how KRA goes about setting milestones, objectives and goals. The government sets its overall objectives and each department is required to meet its internal targets. Especially on who undertakes ICT strategy tasks and which people are involved. The study found out that the ICT office, which is under the Corporate Support Services Department, led by its manager handle the short term and long term ICT plans but in conjunction with all other departments especially operations and domestic taxes. Among the seven major departments in KRA which are headed by commissioners, the ICT office falls under Corporate Support Services Department. ICT was seen as an enhancer hence it cuts across all sections of the parastatal. According to the report, KRA has a toolkit for balanced scorecards that

is used for this and the government has established performance contracting and annual reviews to keep an eye on KRA's performance.

4.2.2 Information Management System Integration Strategy

The goal of the study was to determine whether KRA has any intentions to of enhancing revenue collection, increase operational efficiency and improve customer service by integrating their systems. The respondents concurred that KRA planned to enhance service quality and accessibility. A customer service charter, performance standards, improved ICT growth strategies, a baseline annual customer satisfaction survey, internal work standard measurements and annual financial performance measures were also provided as additional means of achieving this. The interviewees all had considerable experience in their current roles and understood what was required from the study and the institution's direction.

The interviewees generally agreed that KRA had plans to improve on service provision and outlined some of the plans that KRA had in its quest to achieve full integration in its operations as they look to being a world class revenue collection authority. The interviewees also generally agreed that they had some challenges with information systems management and that a proper integration can go a long way in sorting the issues. The study also aimed to identify the current types of information systems in use at KRA. The respondents agreed to some extent that previous system integrations had been initiated and executed well albeit some issues such data accuracy, privacy and security. Respondents also agreed that it was very critical for the information management system integration progress for the success of e-government initiatives in Kenya. Finally, the senior officials stated that they had benchmarked the integration of its e-services portal with the e-government platform. The revenue authority had benchmarked itself with the government

of Estonia. According to the organization of economic corporation and development, Estonia had successfully integrated a data infrastructure for the provision of public services.

According to the study, the respondents indicated that KRA had well-structured and serviced digital platforms and infrastructure. They also made it very clear that their online platforms and web support were well integrated with the internal systems with adequate redundancies and rare downtime. The interviewees also indicated that they adequate IT infrastructures and systems together with adequate human resource to handle the integration process. Finance and HR are the two internal modules that are integrated the most. Procurement is in the process, but it is moving slowly due to opposition to change. In terms of digital infrastructure, the study found out that most of the network infrastructures and platforms were available. Though the cloud-based platforms were poorly managed and monitored. This was another area they had a hard time improving because of change management issues.

According to the study, the stakeholders also had some input in the integration process. The interviewees clearly indicated that the business objectives of KRA superseded their customer service initiatives. This was noted as a hindrance to the implementation of the system integration. However, the respondents revealed several agencies, both public and private, which they feel should be integrated urgently into the KRA-egovernment portal. Banks, supermarkets and the Huduma center were mentioned. They also mentioned that KRA implements a strategy for customer service improvement in its operational plans, which include baseline surveys, annual evaluations and surveys, active customer service portals, websites, emails and 24-hour operations as well as liaison offices around east Africa and weekly stakeholder meetings. The respondents also proposed capacity building and e-workshops. This will help the proposed integration to enhance the general user experience of taxpayers and the business community.

4.3 Structured questionnaire: The Response Rate

The study involved 66 employees across three tiers of management at the Kenya Revenue Authority headquarters in Nairobi. This amounts to a 91% response rate, which is higher than the 70% average suggested by Mugenda and Mugenda (2003) for surveys and is deemed sufficient for generalizing findings.

Table 4.1

Response Rate

Categories	Total Targeted	Total Collected	Response Rate (%)
Top management	12	9	75
Middle level management	30	28	93.3
Low level management	30	29	96.7
Total	72	66	91.6

4.3 Demographic data

4.3.1 Gender of respondents

The study requested demographic information from the participants, such as their age, gender and educational attainment. The study found that among the respondents, there were 34.85% women and 65.15% men. This demonstrates that both sexes are quite well represented, despite the tendency for males to prevail. On table 3.3, this information is provided.

Table 4.2*Gender of Respondents*

Valid gender	Frequency	Percent	Valid percent	Cumulative percent
Male	43	65.15	65.15	65.15
Female	23	34.85	34.85	100
Total	66	100	100	

4.3.2 Age group of the respondents

The results indicate that 28.6% of the respondents were under 30 years old, and slightly less than half (42.9%) were between the ages of 31 and 40. The participants' average age was thirty-two. The results show that middle-aged (30–50 years old) employees make up the bulk of the Kenya Revenue Authority's managerial workforce. The results also demonstrate that the Kenya Revenue Authority's management team is diverse in terms of age as the sample includes both young and elderly individuals.

Table 4.3*Age of Respondents*

Age	Frequency	Percent	Valid Percent	Cumulative Percent
24 – 29 years	9	13.6	13.6	13.6
30 – 39 years	27	40.9	40.9	54.5
40 – 50 years	18	27.2	27.2	81.7
Over 50 years	12	18.3	18.3	100.0
Total	66	100.0	100.0	

4.3.3 Education Level

According to the results, the majority of respondents (53.03%) had a bachelor's degree, while the remaining respondents (37.9%) had a postgraduate degree and (9.09%) had a higher diploma. Considering that every research participant had completed post-secondary education, this demonstrates the high level of education held by managerial personnel at the Kenya Revenue Authority. This indicates that study participants possessed the necessary literacy and educational background to understand the questions on the questionnaire.

Table 4.4

Education level

Education level	Frequency	Percent	Cumulative percent
Higher diploma	6	9.09	9.09
Bachelor's Degree	35	53.03	62.1
Post-Graduate Degree	25	37.9	100
Total	66	100	100

4.4 Descriptive Analysis

A systematic questionnaire was used to gather the research data, which was then evaluated in line with established objectives to create descriptive statistics that were used to explain the characteristics of the study variables and the correlations between the independent and dependent variables.

For each of the study variables, the means and standard deviations were initially determined; Information systems strategy to support e-government integration, Digital infrastructure strategy to support e-government integration, stakeholder participation strategy to support e-

government integration and e-government services integration factors using the indicators of each variable. Using multiple regressions, the mean values for the independent variables were regressed against the mean for the dependent variable.

4.4.1 Information systems

The purpose of the study was to characterize KRA's approach to information system integration. The majority of respondents (M=3.83) believed that KRA analyzes data and presents useful information using business intelligence tools. The KRA information system assists the company in transitioning from inefficient business processes to accepted practice processes, according to the majority of respondents (M=4.10). Additionally, they tended to concur that information systems facilitate the integration of systems, data, and processes among various government departments (M=3.87). With a high degree of agreement across most of the elements and a strong average score, KRA's information system met the requirements of a fully operational information management system. Improved coordination and communication were made possible by the general flow between subunits, standardization, and integration. This aligns with the conclusions of Mackinnon (2008), who discovered that many industries view information systems as a competitive requirement, particularly those that operate in a worldwide and dynamically competitive context.

Table 4.5**Information Systems analysis**

	M	SD
KRA analyzes data using business intelligence tools and presents relevant information	3.83	1.179
KRA has a system in place for managing the authority's relationships and interactions with taxpayers	3.10	1.038
The centralization of data made possible by the information technology facilitates administrative tasks	2.59	1.268
KRA information systems support the integration of data, processes and systems across different government agencies	3.87	.448
An organization can transition from inefficient business processes to recognized best practices with the use of an enterprise information system.	4.10	.663
Users are aware of the commonly used applications for online government services	4.01	.828
The website is user-friendly and easily accessible to all users (both internal and external)	3.99	1.056

4.4.2 Digital infrastructure

The purpose of the initial study was to gauge respondents' opinions on the digital infrastructure strategy to support e-government integration. As indicated by the mean of 3.99, the respondents strongly agreed with the assertion that government agencies like KRA use up-to-date software and hardware to support online public services. Furthermore, as seen by the mean score of 4.46, the respondents strongly agreed with the claim that there is a standardized approach to technology procurement and implementation procurement and implementation. There was a strong agreement that the available digital communication tools are sound in terms of technology and functionality as a score of 3.64 was reached. A mean of 3.01 was achieved on the issue of cybersecurity measures being in place to protect online government systems and data meaning that the

respondents either somewhat agreed or were unsure. Additionally, a mean score of 2.91 achieved showed that the respondents were did not completely agree with each other on the current network infrastructure and internet provision's reliability and sustainability. This pointed out some problems with infrastructure maintenance and internet service providers. The respondents also almost disagreed or were unsure on the fact that the data centers were secure, reliable and compliant with relevant standards as a mean of 2.59 was attained. This shows a great deal of disaster recovery negligence. Though the respondents tended to agree on the fact that KRA had sufficient data center capacity to support the storage and processing needs of e-government data as a mean of 3.59 was attained.

Table 4.6***Digital Infrastructure analysis***

	M	SD
Government agencies like KRA use up-to-date software and hardware to support online public services	3.99	1.056
There is a standardized approach to technology procurement procurement and implementation	4.46	0.973
The available digital communication tools are sound in terms of technology and functionality	3.64	0.817
Cybersecurity measures are in place to protect online government systems and data	3.01	0.985
The current network infrastructure and internet provision is reliable and sustainable	2.91	0.944
The scalability of the network infrastructure can meet the demands of growing e-government services	3.99	1.056
KRA has sufficient data center capacity to support the storage and processing needs of e-government data	3.59	0.893
The data centers are secure, reliable and compliant with relevant standards	2.59	1.268

4.4.3 Stakeholder Participation

Respondents generally agreed that Information systems support the integration of data across different Government agencies as seen by the mean score of 4.54. With a mean of 4.46, the respondents also strongly agreed with the fact that within government agencies, the resistance to change has an impact on the implementation of system integration. With a mean of 3.84, the respondents appeared to agree that KRA Information systems are leveraged to improve taxpayer experience, to perform tax obligations and access information. This means there is an issue with that statement. With a mean of 2.07, the respondents also tended to disagree with the claim that there's effective tax administration through enhanced control and monitoring of taxpayer activities. The respondents did, however, have a slight tendency to concur with the fact that user engagement, training and support were critical for successful integration adoption and

satisfaction with a mean score of 3.87. Some management staff felt that taxpayer participation would be tedious and that they had done enough due diligence. As seen by the mean grade of 2.91, respondents tended to disagree that Measures were available to ensure digital inclusivity for all users/staff including people leaving with disabilities. Generally, it was agreed that Government involvement in staff training programmes and taxpayer system awareness enhances seamless integration. This will go a long way in helping the Kenya Revenue Authority achieve the much required integration milestones hence aligning its business processes.

Table 4.7

Stakeholder participation analysis

	M	SD
Information systems support the integration of data across different agencies	4.54	0.774
In government agencies, the resistance to change has an impact implementation of system integration	4.46	0.502
KRA Information systems are leveraged to improve taxpayer experience, to perform tax obligations and access information	2.07	1.289
There's effective tax administration through enhanced control and monitoring of taxpayer activities	3.84	0.828
User engagement, training and support are critical for successful integration adoption and satisfaction.	3.87	0.448
Measures are available to ensure digital inclusivity for all users/staff including people leaving with disabilities	2.91	0.944
The absence of digital skills among staff and clients causes a serious inability to participate in system integration	4.69	0.956
Government involvement in staff training programmes and taxpayer system awareness enhances seamless integration	4.16	0.470

4.4.4 E-government Services integration

Generally, the complete integration of the egovernment modules with all government agencies and especially with KRA would be beneficial to all parties involved. The respondents agreed largely on the fact that Legacy systems in government agencies like KRA could be integrated with e-government newer technologies with a mean of 3.84. However, the respondents were unsure on the issue of different government systems and platforms being able to communicate and exchange data seamlessly with a mean of 2.59. Also respondents slightly agreed with the issue of the government agencies enabling integration with external systems, such as banks and payment options, that support user-friendly interfaces and seamless experiences with a mean score of 2.91. Finally, on the statement that the e-government systems can improve transparency, accountability and citizen participation in government processes, respondents strongly agreed as a mean of 4.54 was achieved.

Table 4.8**E-government Services Integration analysis**

	M	SD
legacy systems in government agencies like KRA can be integrated with e-government newer technologies	3.84	0.828
Different government systems and platforms are able to communicate and exchange data seamlessly	2.59	1.268
Government agencies enabled integration with external systems that support user-interfaces and seamless experiences	2.91	0.842
E-government systems can improve transparency, accountability and citizen participation	4.54	0.774

4.6 Inferential Analysis

The purpose of the study was to determine how well the independent variables—information systems, digital infrastructure and stakeholder participation—would estimate the dependent variable— integration of e-government services. In order to support the integration of e-government services with the KRA systems and services, it was tested whether there was a substantial relationship between information systems, digital infrastructure and stakeholder participation. Therefore, using the indices acquired for all the variables, the study performed a correlation analysis, multiple regressions and an analysis of variance on the study variables.

4.6.1 Correlation Analysis

Table 4.9

Pearson Correlation

	Y	X1	X2	X3
(Y) E-government Services Integration	1.000	.585**	-.144	.452**
(X1) Information systems		1.000	.007	.368**
(X2) Digital infrastructure			1.000	.373**
(X3) Stakeholder participation				1.000

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

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

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

Table 3.9's correlation analysis findings under a 5% level of significance and utilizing the Pearson's product method demonstrates that - information systems and stakeholder involvement were two independent factors that were significantly correlated with the integration of e-government services ($r = 0.585$, $p = 0.05$). The findings indicate that Information systems ($r = 0.585$) and stakeholder involvement ($r = 0.452$) had the strongest relationships with the integration of e-government services, respectively, whereas digital infrastructure ($r = -0.144$) had little relationship. It was also taken into account how each independent variable related to the others. The association between Information systems and digital infrastructure ($r = 0.007$) was incredibly weak. However, stakeholder participation and digital infrastructure were both very significant ($r = 0.373$). Information systems and stakeholder participation were found to have a significant relationship and the research continued to assess the research model using multiple regression analysis.

4.6.2 Regression Model

After determining that there were significant correlations between the independent variables and the dependent variable (e-government services integration with KRA as a case study), multiple regression was used to estimate the model:

$$Y = \beta_0 + b_1X_1 + b_2X_2 + b_3X_3 + \epsilon$$

Where:

Y = was the value of the Dependent variable that was being explained (E-government Services Integration)

β_0 = Y-intercept or Constant Term

$\beta_1, \beta_2, \beta_3$ = are the Slopes for X_1, X_2, X_3 (Beta coefficients)

X_1 = first independent variable that was explaining the variance in Y (Information systems)

X_2 = second independent variable that was explaining the variance in Y (Digital Infrastructure)

X_3 = is the third independent variable that was explaining the variance in Y (Stakeholder participation)

ϵ = error of prediction

The results were captured in table 3.10

Table 4.10*Regression Model*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.223	.520		2.354	.022
Information system	.362	.080	.439	4.550	.000
Digital infrastructure	-.207	.068	-.296	-3.059	.003
Stakeholder participation	.580	.151	.401	3.850	.000

Dependent Variable: E-government services integration

Unstandardized Coefficients are $\beta_0 = 1.223$, $\beta_1 = 0.362$, $\beta_2 = -0.207$, $\beta_3 = 0.580$ hence the prediction equation: $Y = 1.223 + 0.362X_1 + -0.207X_2 + 0.580 X_3$

Where:

Constant = 1.223, shows that if all three independent variables (information systems, digital infrastructure and Stakeholder participation) were all rated as zero changes in the support of e-government services integration. The value would be 1,223.

$X_1 = 0.362$, If X_2 and X_3 remain the same, this shows that for each extra unit increase in information systems results in 0.362 increase in e-government services integration.

$X_2 = -0.207$, If X_1 and X_3 remain the same, this shows that for each extra unit increase in digital infrastructure results in -0.207 increase in e-government services integration.

$X_3 = 0.580$, If X_1 and X_2 remain the same, this shows that for each extra unit increase in stakeholder participation results in 0.589 increase in e-government services integration.

The ideal weights for the regression model were displayed in the coefficients table above. Standardized regression differs from non-standardized regression in that it does not use a constant. This implies that the mean is subtracted from each piece of data before the result is divided by the standard deviation.

The mean and standard deviation of each value of X and Y beneath the beta column of the standardized coefficients have been set to zero and one respectively.

In this case, the value of β_0 is zero and is excluded from the equation.

We can anticipate the model to support the integration of e-government services from information systems, digital infrastructure and stakeholder participation using the information provided in the Coefficients table. We can also assess whether X_1 , X_2 , and X_3 significantly contribute to the model. The model was a good fit significantly forecasting a model to support the integration of e-government services from information systems, digital infrastructure and stakeholder participation because the significance levels are smaller than alpha, chosen to be .05.

Table 4.11

Regression Results of significant study Variables

				Change Statistics				
R	R Square	Adjusted	Std. Error of the Estimate	R Square		Sig.		
		R Square		Change	F Change	df1	df2	Change
.693 ^a	.480	.457	.47011	.480	20.327	3	66	.000

Predictors: (Constant), information systems, digital infrastructure and Stakeholder participation.

Multiple correlation coefficient (R) is a statistic. It is the correlation coefficient, which is always positive and ranges from 0 to 1, between the observed and projected values of Y. The stronger the correlation between the independent and dependent variables, the closer R is to 1. The multiple R value for this prediction of Y from X1, X2, and X3 is 69.3%. A substantial connection between the dependent and independent variables is shown by this high result.

The coefficient of determination is known as R². It represents the proportion of the dependent variable's overall fluctuation that the independent variables X1, X2, and X3 can account for. In this instance, metrics of information systems, digital infrastructure and stakeholder involvement can be used to predict 48.0% of the variance in the e-government services integration measure. This is an average degree of correlation rather than a high number.

The importance of the dependent variable on the independent variables was assessed by the research using the results from Table 3.11. The outcomes, $t = 20.327$ and $p\text{-value} = .000$, show that the $p\text{-value}$ for information systems is less than 0.05. This is an indication that at $\alpha = 0.05$ information systems factor is useful as a predictor for the integration of e-government services. Table 3.11's findings reveal that Information systems, digital infrastructure and stakeholder participation factors account for 48% of the variation in e-government services integration at KRA, as evidenced by the coefficient of determination (expressed by R²) of .480. In summary, Information systems, digital infrastructure and stakeholder participation factors could significantly predict the integration of e-government services at the Kenya Revenue Authority.

4.6.3 ANOVA

The model equation was used to generate the study's Analysis of Variance (ANOVA) results in order to assess the study model's goodness of fit. Based on the Kenya Revenue Authority's predictor variables, the model may predict the integration of e-government services, as indicated by the ANOVA table. Column Sig. is.000b. This indicates that the outcome variable is highly predicted by the statistically significant regression model, which had a significance level of less than 0.05. The data and the model had a very good fit. The residual's sum of squares is 14.586. The total of the squared residuals is this. The estimate's squared standard error, or mean square residual, is 0.221. The total sum of squares, or 28.063, is the sum of the squared disparities between the observed values of Y and the mean of Y. The regression coefficients, or beta-coefficients, were used to interpret the quality of fit at the 0.05 level of significance. The model is appropriate for describing the integration of e-government services at KRA when all of the regression coefficients are zero (i.e., $\beta_1 = \beta_2 = \beta_3 = 0$); however, if any of the regression coefficients are not zero (i.e., $\neq 0$), the model is not appropriate. Table 3.11's findings reveal that at least one of the predictors was significant at a 5% level at p-value =.000 and p-value 0.05; Information systems, digital infrastructure and stakeholder participation factors are useful in predicting the e-government services integration at the Kenya ports authority.

Table 4.12
Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.477	3	4.492	20.327	.000 ^b
	Residual	14.586	66	.221		
	Total	28.063	69			

a. Dependent Variable: integrated e-government services

b. Predictors: (Constant), information systems, digital infrastructure and stakeholder participation

a. Dependent Variable: e-government services integration

b. Predictors: (Constant), Information systems, digital infrastructure and stakeholder participation

4.7 Discussion of Findings

In the initial phase of the study, which involved interviews, it was discovered that KRA had plans to integrate its services within the e-government platform. Also included were specifics on how this was to be carried out, such as a customer service charter, baseline surveys to ascertain the current state of affairs, an annual survey of customer satisfaction, and internal work standards measurements. These results are consistent with Porter's (1998) theory, according to which operational reactions are a stage in a planning process that connects operational goals to those of the wider organization. Therefore, general rules and procedures for using a company's resources in support of its long-term competitive aim are the main focus of operational challenges.

The poll also revealed that KRA employed strategies in an effort to uphold high standards. In-depth revenue authority Among these tactics were planning improvements, developing a master plan, improving taxes handling processes, high-level organizational structuring and investing in IT for revenue operations and procedures.

The study's second phase shows that achieving full system integration did not heavily depend on the digital infrastructure's longevity and dependability. The investigation demonstrated that when user and consumer needs changed, so did information systems developments. The most common areas of innovation are found in computer automated operating systems, user-friendly websites, and social media platforms. The revenue collection authority has intentions of enhancing operational efficiency and improving customer service by integrating their systems. The respondents agreed that KRA planned to enhance service quality and accessibility. A customer service charter, performance standards, improved ICT growth strategies, a baseline annual customer satisfaction survey, internal work standard measurements and annual financial performance measures were also provided as additional means of achieving this. From the analysis, the respondents generally agreed that KRA had plans to improve on service provision and outlined some of the plans that they had in their quest to achieve full integration in its operations as they look to being a world class revenue collection authority. Complete integration of services and procedures was found to be hampered by a strong reluctance to change, as is the case with the majority of state-owned enterprises. The study also assessed and analyzed the issues raised in terms of challenges with the information systems management and that a proper integration can go a long way in sorting the issues. The respondents agreed to some extent that previous system integrations had been initiated and executed well albeit some issues such as data accuracy, privacy and security. Respondents also agreed that it was very critical for the information management system

integration progress for the success of e-government initiatives in Kenya. The senior officials stated that they had benchmarked the integration of KRA's e-services portal with the e-government platform against that of the government of Estonia. Estonia has effectively integrated a data infrastructure for the provision of public services, according to the organization of economic company and development.

However, the alarming study showed that the entire digital infrastructure was not being used effectively to achieve the optimum results from established processes. According to the study, the respondents indicated that KRA had well-structured and serviced digital platforms and infrastructure. The study also established that there was little support to efficiently use the available infrastructure to attain maximum resource allocation for a seamless system propagation and services management. However, it was very clear from the study results that the local revenue authority's online platforms and web support were well integrated with the internal systems supported by adequate redundancies and a very rare downtime.

There was a clear indication that user involvement in system implementation reduced the risk of resistance to change within the organization. From the analysis it was also noted that the organization had adequate IT infrastructures and systems together with adequate human resource to handle the integration process. Finance and HR are the two internal modules that were integrated the most. Procurement is in the process, but it is moving slowly due to opposition to change. In terms of digital platforms, the study found out that most of the platforms were available. Though the cloud-based platforms were poorly managed and monitored. This was another area they had a hard time improving because of change management issues.

To reduce delays in business processes, it was pointed out that there needs to be a proper collaborative platform between KRA and taxpayers. According to the study, the stakeholders also

had some input in the integration process. The interviewees clearly indicated that the business objectives of KRA overshadowed their customer service initiatives. This was noted as a hindrance to the implementation of the system integration. However, the respondents revealed several agencies, both public and private, which they feel should be integrated urgently into the KRA-egovernment portal. Banks, supermarkets and the Huduma center were mentioned. They also mentioned that KRA implements a strategy for customer service improvement in its operational plans, which include annual evaluations, active customer service portals, websites, emails and 24-hour operations. The respondents also proposed capacity building and e-workshops. This will help the proposed integration to enhance the general user experience of taxpayers and the business community

According to the results of the correlation study, the dependent variable and the Information systems variable were highly correlated (.585**). However, the digital infrastructure variable and its indicators did not have a significant correlation with the dependent variable (-.144). User engagement however also had a significant correlation with the dependent variable (.452**). The research study also demonstrates how user interaction and dynamics in Information systems work together to significantly allow for system integration with the e-government services portal. The results in table 3.11 show that the coefficient of determination shown by R^2 was 48% of variation in e-government services integration explained by; Information systems, user engagement and meagerly by digital infrastructure factors. This shows that Information systems, user engagement and digital infrastructure factors were significant in supporting the integration of KRA platforms with e-government services portal. This also shows that digital infrastructure as a strategy on its own cannot support a complete systems integration but needed to be complimented

by the other two variables which is the basis of our objectives in the study. Generally, it was shown from the results that digital infrastructure was a misunderstood and underestimated phenomenon which if well explained would immensely benefit the users and the authority as whole. According to the findings of the regression analysis of all research variables, the stakeholder engagement factor greatly supported the integration of e-government services with those of KRA ($\beta_3=0.580$, $p=.000$). Additionally, the dependent variable was statistically affected by the Information systems factor ($\beta_1=0.362$, $p=.000$). The findings demonstrate that the mentioned factors had a favorable influence on the dependent variable since $p\text{-value} = .000$ and $p\text{-value} 0.05$, respectively, suggest a 5% significance level. This indicates that the integration of e-government services at the Kenya Revenue Authority may be predicted by at least one of the predictors—stakeholder participation or the information systems element.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section discusses a summary of the significant discoveries made while pursuing the investigation's objectives and pertinent research issues. The conclusions drawn from these discoveries and discussions are then used to support the research's recommendations for both its application and methodology. Finally, the sections highlight the limitations and suggestions for additional evaluation.

5.2 Summary of the Study Findings

In order to achieve a seamless and complete KRA systems integration within the e-government platform, the study aimed to determine the respondents' opinions on Information systems, digital infrastructure and stakeholder participation strategies. The majority of the respondents felt that Information systems within the KRA, have important implications for fostering integration of egovernment services. The majority of respondents also concurred that e-government services integration is significantly supported by stakeholder participation. The strategic use of digital infrastructure, which may be boosted by effective Information systems and stakeholder participation, was also acknowledged as a key competitive difference. The primary findings mentioned from the various objectives are as follows:

5.2.1 Information systems

The study found that any corporation's long-term organizational goals, especially the Kenya Revenue Authority, depend heavily on the strategic and vital integration of e-government services. According to the study, the KRA's ability to successfully integrate e-government

services depends on how well information systems are implemented. Strategies for information systems are essential for decomposing data, processes and system silos within KRA. By enabling seamless data exchange, process automation and system interoperability, IS empowers KRA to provide efficient, transparent and user-centric services. The research study also indicated that proper data management eases administrative functions and improves information flow across departments and taxpayers. Enhanced KRA performance supports integration of e-government services in terms of economic efficiency and reduced bottlenecks. The study also revealed that the efficient use of online and social media platforms to increase communication and collaboration is to be ok but should be optimized in the services integration as a whole. Increased communication and collaboration between KRA operatives and taxpayers/clients will reduce tax malpractices and complaints hence optimizing revenue collection. Collaborative efforts can generally lead to better resource utilization and reduced loss of revenue. Also as a conclusion, it was viewed that measures were in place to increase digital inclusivity and awareness, ensure information sharing to all relevant recipients and mitigate factors that affect information flow between the government agencies by way of integration and accessibility. Generally, users should be aware of the commonly used applications for online government services.

5.2.2 Digital infrastructure

The study found that any company's long-term organizational goals, especially those of the Kenya Revenue Authority, depended on how well their systems can integrate with others in the business ecosystem. The respondents concurred that the effectiveness of KRA's operations depended heavily on the computer network's dependability. The research study also showed that improved digital access, a well-planned computer network infrastructure,

and awareness of available ICT resources all significantly improved KRA's performance and technology absorption.

The study also showed that while integrating e-government services, effective use of social media and online platforms to boost communication and collaboration needs to be optimized. The study observed the current network infrastructure and internet provision was to be improved in terms of reliability and scalability. This is for the network infrastructure to meet the demands of e-government services. It was also observed that departments should organize events such as webinars, conferences and seminars where industry experts and thought leaders can share their insights and experiences related to tax remission challenges and the advantages of integration of online government services into a single platform. These events also provide opportunities for networking, learning and exchanging ideas.

It was also observed that cybersecurity issues were still pending and measures were to be put in place to mitigate cyberattacks and protect online government activities and user data both from the provider side to the client. All data centers were to receive the required upgrades and disaster recovery sites to be well managed and checked for capacity and processing capabilities when integrated with the e-government platform. Generally, respondents agreed that the network backbone has to be well managed and tested for redundancies.

5.2.3 Stakeholder participation

From the study, it was a general agreement that a lack of stakeholder participation in system design, integration and implementation causes a resistance to change. The study's findings heavily agree on the critical role of stakeholder participation in the successful integration of e-government services at the Kenya Revenue Authority. Engaging diverse stakeholders,

including taxpayers, businesses, government agencies and technology partners, has proven essential for several reasons.

The respondents also tended to disagree with the statement that there was availability of resources to enable them integrate digital skills into their daily duties. Collaborative workshops and forums were discussed and encouraged. Departments were to organize workshops and training programs for individual staff members with issues in digital skills integration in the work environment. Involving a broad range of stakeholders ensures that the e-government system caters to the diverse needs and expectations of all users. This promotes the development of inclusive and relevant services. A collaborative approach and guidance would foster a sense of ownership and collective responsibility. It was indicated that the respondents also agreed to a large extent that government involvement in staff training programmes and taxpayer system awareness enhances seamless integration. Finally, the respondents extensively agreed that the high cost of effective training and development on emerging technologies and user digital skills affected supply chain technology absorption as a mean of 4.16 was obtained.

Generally, the Kenya Revenue Authority is to foster partnerships and alliances. Formation of partnerships with other government agencies and collaborations with different groups of taxpayers will broaden the scope of e-services integration. These collaborations will amplify the impact of e-government services integration and facilitate tax administration.

5.3 Conclusions of the Study

The integration of e-government services in Kenya presents a complex but promising picture, as demonstrated by the Kenya Revenue Authority. The results of the study indicate that information technologies play a major role in easing the integration of e-government services. Correlation analysis indicates that it has a substantial impact on the integration of e-government services by 0.585. This demonstrates that the majority of respondents think there will be significant

inefficiencies in tax administration and management in the absence of ICT-driven systems. All departments and services rely heavily on ICT to function. According to the research, the Kenya Revenue Authority started a change management process because of the new tax laws and agency separations that were required. The improvements were centered on the information systems strategy, which was implemented in stages to facilitate adoption and integration. The study found that the changes affected various departments, so all organization's stakeholders were impacted in some way.

Stakeholder participation was also a relatively key factor to supporting the integration of e-government services with the correlation analysis results in a significance of 0.452. The study found out that the stakeholders directly related to KRA are absolutely aware of the changes that take place and that at every stage of the process, these change processes were communicated to them through various media and alerts. The results of this study show that internal stakeholders, the majority of whom were KRA employees who were not in management, were not involved in the planning stage of the change management process. Their complete involvement in the process was necessary due to the fact that they are the ones handle most processes. The survey also found that there weren't enough external stakeholders participating in the transformation initiative's planning. Also, less government officials were involved in the planning stage, despite the fact that they are considered to be key stakeholders, which made it even more concerning.

Ultimately, the analysis demonstrates that the role of digital infrastructure in facilitating the integration of e-government services was negligible. The study reveals a significance of - 0.144, most likely as a result of the respondents' difficulty realizing the obvious need for integration even when the current system was functioning perfectly. By identifying specific challenges KRA faced in implementing IMS strategies, such as data security, user training, and

infrastructure gaps, this case study provides practical lessons on overcoming obstacles. It contributes to the knowledge of integrating IMS into government services, which can inform future efforts to mitigate such challenges in Kenya and similar developing economies.

The analysis of the study detected that digital infrastructure on its own cannot effectively support the integration process but required the input of stakeholder participation and information systems. The goal of the study was to identify information systems strategies that can support the integration of e-government services. The prominence of the distinctive but interrelated processes demonstrated how the information exchange in the revenue authority actually took place. It was emphasized that businesses can absorb and incorporate various resources from each relevant department in the organization. From the study it was clear that Taxpayers expect a seamless, user-friendly experience when interacting with KRA's e-government services. They value convenience, efficiency and clear communication. According to the results of the study, E-government services should be designed with the user at the forefront. This involves incorporating user feedback, simplifying interfaces and offering personalized experiences. A user-centric approach not only enhances satisfaction but also drives higher adoption rates and improved tax compliance. This contribution broadens the knowledge base on how digital platforms can foster compliance and increase public trust in government services.

Finally, we can conclude by saying that information systems are crucial success factors in the support of an integrated services system. Successful implementation of IS strategies requires a comprehensive change management plan. This involves addressing employee resistance, providing adequate training and fostering a culture of collaboration. Additionally, engaging taxpayers and other stakeholders throughout the process is crucial for building trust and ensuring the relevance of e-services.

5.4 Recommendations

The study examined the key drivers of the integration implementation success. The results of the studies indicated that information systems were required to ensure that system integration deployments were done well and the accuracy and availability of data is upheld. ICT offers numerous opportunity to create and uphold fresh ideas for integration A robust technological infrastructure is essential for e-government integration. This includes data management tools, integration platforms, automation software, and user-friendly interfaces. KRA should invest in modernizing its technology stack to keep pace with evolving user expectations. A successful implementation of IS strategies requires a comprehensive change management plan. This involves addressing employee resistance, providing adequate training and fostering a culture of collaboration. Additionally, engaging taxpayers and other stakeholders throughout the process is crucial for building trust and ensuring the relevance of e-services. It's vital to establish a clear metrics for measuring the impact of e-government integration efforts. These metrics could include efficiency gains, cost savings user satisfaction and revenue collection. Regular monitoring and evaluation enable KRA to identify areas for improvement and make data-driven decisions.

The study also recommends that KRA upgrades their legacy systems, adopt cloud-based solutions and leverage Application Programming Interfaces for seamless integration. They should explore the use of AI and machine learning for data analysis, process automation and personalized service delivery. Then, implement clear policies and procedures for data management, security and privacy. The aim is to ensure compliance with national e-government standards and frameworks. Finally, KRA should create a detailed roadmap for IMS implementation, outlining specific goals, timelines and resource allocation. They should actively involve taxpayers, businesses and other stakeholders in the design and evaluation of e-government services by fostering open

communication channels to gather feedback and address concerns. The roadmap should align with KRA's overall e-government vision and strategic objectives.

5.5 Recommendations for further study

The aim of this study was to look into the information systems strategies to support the integration of e-government services. More study can be done to get a broader perspective that will help in the generalization of crucial tactics that can accomplish integration of services as a whole. Other tactics that affect the e-government services integration of the Kenya Revenue Authority were also found by the study to exist. More study is advised to make this list more complete. The conceptual design can be further validated in the future by doing quantitative data research on digital infrastructure integration with the organization's digital network architecture. This would assist the business in utilizing effective management

References

- Asiligwa, M. (2016). *Adoption of E-Governance in the Public Sector: A Case of Nairobi City County*. [Master's Thesis, Kenyatta University]. <https://ir-library.ku.ac.ke/bitstream/handle/123456789/15424/Adoption%20of%20e-governancein%20the%20public%20sector.pdf?sequence=1&isAllowed=y>
- Awais, M. Irfan, M. Bidal, M., & Samin, T. (2012). Helpful Business Value of Advance Bal Information System,. *IJCSI International Journal of Computer Science Issues* 9(2);, 415–422. <https://www.proquest.com/docview/963361916?sourcetype=Scholarly%20Journals>
- Beheshti, H. M., & Beheshti, C. M. (2010). Improving productivity and firm performance with enterprise resource planning. . *Enterprise Information Systems*, 4(4), 445–472. <https://doi.org/10.1080/17517575.2010.511276>
- Bertalanffy, V. L. (1968). *General systems theory. New Currents in Modern Thought*. Braziller Inc.
- Bordens, K. (2008). *Research design and methods: a process approach*. McGraw-Hill Education.
- Borg, R. & Gall, J. (2007). *Educational research: An introduction.*: Pearson Education.

- Broadway, R. W. (2012). *From optimal tax theory to tax policy: retrospective and prospective views*. MIT Press.
- Chandler, D. (2000). *Technological or Media Determinism*. Aberystwyth University. .
- Chen, S.C, Chen M, Zhao N, Hamid S, Chatterjee K, Armella M . (2009). Florida public hurricane loss model: Research in multi-disciplinary system integration assisting government policy making. *Government Information Quarterly*, 26(2) , 285–294 . <https://doi.org/10.1016/j.giq.2008.12.004>
- Coleman S. (2006). *African e-Governance - Opportunities and Challenges*., Oxford University Press.
- Collis, J. & Hussey, R. . (2014). *Business research: A practical guide for undergraduate and postgraduate students*. Palgrave Macmillan.
- Cooper, C. R., & Schindler, P. S. (2008). *Business Research Methods* (10th Ed.). McGraw-Hill.
- Corley, K. G., & Corley, K. G. (2016). Building Theory About Theory Building : What Constitutes a Theoretical Contribution? *Academy of Management Review*, 36(1), 12-32. <http://dx.doi.org/10.1177/0007650316651343>
- Dandago,T. (2012). The Impact of Information System (IS) on Organizational Performance. *European Journal of Business and Management* , 6(37), 331-339. <https://core.ac.uk/download/pdf/234695393.pdf>
- Davis, F.D. . (1989). “Perceived usefulness, perceived ease of use and user acceptance of information technology”, . *MIS Quarterly*,13(3), 319-340. <https://doi.org/10.2307/249008>
- De Wulf, L., & Sokol, J. B. (2005). *Customs Modernization Handbook*. World Bank

- DiMaggio, P.J. & Powell, W.W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(1), 147-160.
<https://doi.org/10.2307/2095101>
- Doug, M. & Scott, W.R. . (2004). *Organizations and Movements. In Social Movements and Organization Theory*. Cambridge University Press.
- Dramod, K. (2004). *The Challenges of Tax Collection in Developing Economies*. University of Georgia
- Fraenkel, R. J., & Wallen, E. N. (2000). *How to design and evaluate research in education (4th ed.)*. McGraw-Hill.
- Gary, M. S. (2017). Stretch Goals and the Distribution of Organizational Performance. *Organization Science* 28(3), 1-14.
<https://doi.org/10.1287/orsc.2017.1131>
- Government of Kenya (2003). *Economic Recovery Strategy for Wealth and Government of Kenya (GOK)*. Government of Kenya (GOK).
- Guriting, P. & Ndubisi, N.O. . (2006). Borneo online banking: evaluating customer perceptions and behavioural intention. *Management Research News*, 29(1) 6-15.
<https://doi.org/10.1108/01409170610645402>
- Haryani, S., Motwani, B. & Matharu, S.K. . (2015). Behavioral intention of taxpayers towards online tax filing in India: an empirical investigation, . *Journal of Business and Financial Affairs*, 4(1), 70-76.
<https://pdfs.semanticscholar.org/866a/14dade10257f99172b1da39ae7d8977b0d9f.pdf>

- International Monetary Fund (2014). *Fiscal policy and income inequality. International Monetary. IMF Policy Paper.*
<https://www.imf.org/external/np/pp/eng/2014/012314.pdf>
- Ireland, P. (1994).). Supply-side economics and endogenous growth. *Journal of Monetary Economics*, 33(3), 559-571. [https://doi.org/10.1016/0304-3932\(94\)90043-4](https://doi.org/10.1016/0304-3932(94)90043-4)
- Kamau, S. K. (2014). *Enhancing Tax Compliance in Kenya : a Case Study*. United States International University.
- Kenya Revenue Authority. (2012). *Kenya Revenue Authority Strategic plan (2012). Fifth Corporate Plan, 2012/2013.*
<https://www.kra.go.ke/images/documents/7th-Corporate-Plan-FA-Online-version-min.pdf>
- Kenya Revenue Authority (2021). *Annual Revenue Performance Report.*
<https://www.kra.go.ke/images/publications/202021-annual-revenue-performance-final.pdf>
- Kothari, C.R. (2004). *Research methodology: methods & techniques*. New Age International Limited Publishers.
- Kroes, P. & Meijers, A. (2006). The dual nature of technical artefacts. *PhilPapers*, 37(1), 1-4. <https://doi.org/10.1016/j.shpsa.2005.12.001>
- Kuhn, A. (1974). *The Logic of Social Systems*. Jossey-Bass.
- Kumar, R. . (2011). *Research Methodology: A step-by-step guide for beginners. (3rd Edition).* New Age International,
<https://doi.org/http://196.29.172.66:8080/jspui/bitstream/123456789/2574/1/Research%20Methodology.pdf>.

- Liang, Y., Lu, W., & Ying, Z. (2009). Joint modeling and analysis of longitudinal data with informative observation times. *Biometrics*, 65(2), 377–384. <https://doi.org/10.1111/j.1541-0420.2008.01104.x>.
- Macharia, M. . (2016). *Technology adoption to increase Kenya revenue inflows* . Caj News Africa. <https://technoafrika.co.za/tag/technology-adoption-to-increase-kenya-revenue-inflows/>
- MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Routledge. <https://doi.org/10.4324/9780203809556>
- Maisiba, J.G. & Atambo, W. . (2016). Effects of electronic tax system on the revenue collection efficiency of Kenya Revenue Authority. *Imperial Journal of Interdisciplinary Research*, 2(4), 815-827. <http://erepository.uonbi.ac.ke/handle/11295/59706>
- McKinnon, J.J., Jayatilaka, D. & Spackman, M.A. (2007) Towards Quantitative Analysis of Intermolecular Interactions with Hirshfeld Surfaces. *Chemical Communications*, 37(1), 3814-3816. <http://dx.doi.org/10.1039/b704980c>
- McLuhan, R. & Logan, K. (2016). *Understanding New Media*. Key Publishing house
- Melkers, J. & Willoughby, K. (2005). Models of Performance-Measurement Use in Local Governments: Understanding Budgeting, Communication, and Lasting Effects. *Public Administration Review* 65(2), 180-190. <http://dx.doi.org/10.1111/j.1540-6210.2005.00443.x>
- Melville, N., Kraemer, K. and Gurbaxani, V. (2004). Information Technology and Organizational Performance: An Integrative Model of IT Business Value. . *MIS Quarterly*, 28(2,, 283-322. <http://dx.doi.org/10.2307/25148636>
- Morris, T. & Wood, S. (1991). Testing the Survey Method: Continuity and Change in British Industrial Relations. *Work, Employment & Society*,

- British Sociological Association*, 5(2), 259-282.
https://econpapers.repec.org/article/saewoemps/v_3a5_3ay_3a1991_3ai_3a2_3ap_3a259-282.htm
- Mugenda, O. M. & Mugenda, O. M. (2003). *Research methods: Qualitative and Quantitative Approaches*. Acts Press.
- Muturi, H. M. & Kiarie, N. (2015). Effects of online tax system on tax compliance among small taxpayers in Meru county, Kenya. *International Journal of Economics, Commerce and Management*, 3(12), 280-297.
<https://ijecm.co.uk/wp-content/uploads/2015/12/31219.pdf>
- Mimba, S., Putu, N.S., Van-Heden, J., & Tillema, S. (2007). Public Sector Performance Measurement in Developing Countries: A Literature Review and Research Agenda. *Journal of Accounting and Organisational Change*, 3(3), 192-208. <https://doi.org/10.1108/18325910710820265>
- Oduor, M. J. (2019) Liberal democracy: An African critique. *South African Journal of Philosophy*, 38(1), 108-122.
<https://doi.org/10.1080/02580136.2019.1583882>
- Ondara, T.G., Kimani, M. and Kwasira, J. (2016). Influence of online tax filing on tax compliance among small and medium enterprises in Nakuru town, Kenya. *IOSR Journal of Business and Management*, 18(10), 82-92.
<http://dx.doi.org/10.9790/487X-1810028292>
- Orlikowski, W. J. & Iacono, C. S. (2001). Desperately Seeking the ``IT" in IT Research—A Call to Theorizing the IT Artifact. *Information Systems Research*, 12(2), 121-134. <https://doi.org/10.1287/isre.12.2.121.9700>
- Patton, M.Q. (1990). *Qualitative evaluation and research methods*. Sage Publications.

- Porter, M. E. (1998). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. Free Press.
- Prins, J.E.J, Dennis Broeders, H.M. Griffioen. (2012). iGovernment: A new perspective on the future of government digitisation. *Science Direct*, 28(3), 273-282 <https://doi.org/10.1016/j.clsr.2012.03.010>.
- Prybutok, V. R., Xiaoni, Z. & Sherry, D. R. (2008). Evaluating leadership, IT quality, and net benefits in an e-government environment. *Information & Management*, 45(3), 143-152. https://www.researchgate.net/publication/222622887_Evaluating_leadership_ip_IT_quality_and_net_benefits_in_an_e-government_environment
- Rastrick, K., & Corner, J. (2010). Understanding ICT Based Advantages: A Techno Savvy Case Study. *Interdisciplinary Journal of Information, Knowledge & Management*, 5(1). 1-14. <http://dx.doi.org/10.28945/1187>
- Reiss, A. J. (1993). *Understanding and Preventing Violence*,. National Academy Press.
- Rocheleau, B. (2006). *Public Management Information Systems*. IGI publishers.
- Saunders, M. N. K. & Rojon, C. (2012). Formulating a convincing rationale for a research study. *An International Journal of Theory, Research and Practice*, 5(1), 55-61. <http://dx.doi.org/10.1080/17521882.2011.648335>
- Scatteman, A. (2010). *Information technology and public performance management: examining municipal e-reporting*, In Shea, C.M. & Garson, G.D. (eds.). Handbook of public performance information systems. CRC Press.
- Silock, R. (2001) What Is E-Government. *Parliamentary Affairs*, 54(1), 88–101, <https://doi.org/10.1093/pa/54.1.88>
- Suh, N. P. (1990). *The Principles of Design*. Oxford University Press.

- Thabane, L., Ma, J., Chu, R., Cheng, J., Ismaila, A., Rios, L. P., Robson, R., Thabane, M., Giangregorio, L., & Goldsmith, C. H. . . (2010). A tutorial on pilot studies: the what, why and how. *BMC medical research methodology*, 10(1), 167-184. <https://doi.org/10.1186/1471-2288-10-1>
- Tiago, O. & Maria, R. (2010). Understanding e-Business Adoption Across Industries in European Countries. *Industrial Management & Data Systems*, 110(9), 1337-1354. <http://dx.doi.org/10.1108/02635571011087428>
- Tornatzky, L. G., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington Books.
- Türetken, O., Ondracek, J., & IJsselsteijn, W. A. (2019). Influential characteristics of enterprise information system user interfaces. *Journal of Computer Information Systems*, 59(3), 243-255. <https://doi.org/10.1080/08874417.2017.1339367>
- United Nations & American Society for Public Administration. (2001). *Benchmarking E-government: A Global Perspective 2001*. American Society for Public Administration. <https://publicadministration.un.org/egovkb/en-us/Reports/Benchmarking-E-Government-2011>
- United Nations. (2022). *A United Nations e-Government survey 2022, leveraging e-Government at a time of financial and economic crisis*. UN printers.
- Visser, C. B. & Erasmus, J. ((2005).). *The Management of Public Finances: A practical Guide*. Oxford University Press.
- Wasao, D. (2014). *The Effect of Online Tax System on Tax Compliance among Small Taxpayers in East of Nairobi Tax District* (Unpublished Masters Thesis Project). University of Nairobi. <http://hdl.handle.net/11295/74865>
- Wasunna, N., & Frydrych, J. (2017). *Person-to-government (P2G) payment digitization: Lessons from Kenya*. GSMA.

- Waweru, E. (2013). *The Effect of Monetary Policy on Financial Performance of Commercial Banks in Kenya*. [Master's Thesis, University of Nairobi].
<http://erepository.uonbi.ac.ke:8080/xmlui/handle/123456789/60211>
- Wiu, T. & Chiu, C. (2015), TKF Chiu, C Chai. Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. *Sustainability*, 12(14), 55-68.
<http://dx.doi.org/10.3390/su12145568>
- Wood, T. M. . (1991.). Testing the Survey Method: Continuity and Change in British Industrial Relations. *Sage Journals*, 5(2), 1-15.
<https://ideas.repec.org/a/sae/woemps/v5y1991i2p259-282.html>
- Zahra, S. & Covin, S. (1993). Business Strategy, Technology Policy and Firm Performance. *Strategic Management Journal*, 14(6), 451-478.
<https://www.jstor.org/stable/2486755>
- Zhu, J.J.H. and He, Z. (2002). Perceived Characteristics, Perceived Needs, and Perceived Popularity: Adoption and Use of the Internet in China,. *Communication Research*, 29(4), 466-495.
<http://dx.doi.org/10.1177/0093650202029004005>

APPENDICES

Appendix I: Letter of Introduction

Date.....

The Officer in Charge..... P.O Box.....

Dear Sir/Madam,

RE: ACADEMIC RESEARCH PROJECT

I am a Masters student at the Kenya Methodist University. I wish to conduct a study on your institution is among the samples that are meant to facilitate the collection of the necessary information for the success of this research. A questionnaire will be used to gather relevant information to address the research objectives. The purpose of writing to you is to kindly request you to grant me permission to administer the research questionnaire.

Please note that the study will be conducted as an academic research and the information provided will be treated in strict confidence hence strict ethical principles will be observed to ensure this with no victimization. Your acceptance will be highly appreciated.

Yours Sincerely, Tejwok Simon Ajak

Appendix II: Interview Guide

Section A: General Information

1. For how long have you worked at the organization?
2. What is your current role at the organization?
 - ☐ Managerial/Executive Level
 - ☐ Department Head/Supervisor
 - ☐ Technical staff/employee
 - ☐ Other (Please specify)
3. How many years of experience do you have in your current role?
4. What role do you play in strategy formulation?

Section B: Information System Integration

1. What information management systems are currently in use at the organization?
2. Is KRA organization structure suitable for the systems integration with the e-government? If your answer is “No”, explain the challenges posed by the organization structure?
3. What specific challenges does the organization currently face in terms of information management and how can a system integration address these challenges?
4. How well do the existing systems at KRA integrate with each other?
 - ☐ Very well
 - ☐ Well
 - ☐ Moderately
 - ☐ Poorly
 - ☐ Not at all

5. What data accuracy and security issues commonly occur during system upgrades and integration?
6. In your opinion, how critical is information management system integration for the success of e-government initiatives in Kenya?
 - Not critical at all
 - Somewhat critical
 - Moderately critical
 - Very critical
7. Has the e-government and KRA benchmarked the integration of its e-services to any other government e-service portals globally? If yes, please name any with examples

Section C: Stakeholder Participation

1. What do you think are the key business objectives of the Kenya Revenue Authority?
2. In your opinion, what are the needs and expectations of the information systems end-users?
3. In your opinion, which are the external systems or government agencies that the KRA needs to integrate with to improve taxpayer experience?
4. In terms of capacity building, what training and support mechanisms are planned for employees to adapt to a proposed integrated information management system?
5. In your opinion, how will the proposed integration enhance the general user experience of taxpayers and the business community?
6. What data privacy and accuracy issues do you have with the current KRA systems?

INFORMATION MANAGEMENT SYSTEMS STRATEGIES TO SUPPORT THE INTEGRATION OF KENYA'S E-GOVERNMENT SERVICES

The purpose of this study is to evaluate and to investigate the application of information management system strategies to support the integration of government e-services with a focus on KRA. Please answer all questions to the best of your ability. There is no right or wrong answers. What matters is your personal opinion. Thank you for taking the time to complete this questionnaire. Please rate the extent to which you agree with each statement below. Place a $\surd$ or circle around the value corresponding to your personal opinion on one option for each statement.

Appendix III: Structured Questionnaire

Section A: Demographic information

1. Respondent's particulars: Gender

- ☐ Male
- ☐ Female

2. Your age Bracket

- ☐ 20-29 yrs
- ☐ 30-39 yrs
- ☐ 40-49 yrs
- ☐ 50 yrs and above

3. Highest Education Level

- ☐ Certificate
- ☐ Diploma
- ☐ Bachelor Degree
- ☐ Masters degree
- ☐ PHD

Any other please specify.....

4. How long have you worked for this organization?years

Section B: Information Systems

Please answer the following questions to the best of your knowledge. Place a tick ✓ or circle Where

5=Strongly Agree, 4=Agree, 3= Unsure 2=Strongly Disagree and 1= Disagree

	SA	A	U	SD	D
Data Management	5	4	3	2	1
The information system enables centralization of data to ease Administrative activities					
The information system improves information flow across sub-units or departments					
User interface Design					
KRA has a system in place for managing the authority's relationships and interactions with taxpayers					
The website is user-friendly and easily accessible to all users (both internal and external)					
Application Integration					
Users are aware of the commonly used applications for online government services					
KRA information systems support the integration of data, processes and systems across different government agencies					
Business Process Management					
The KRA information system helps in moving the firm from inefficient business process into accepted practice process.					
KRA uses business intelligence tools to analyze data and present actionable information					

Section C: Digital Infrastructure

Please answer the following questions to the best of your knowledge. Place a tick ✓ or circle

Where 5=Strongly Agree, 4=Agree, 3= Unsure 2=Strongly Disagree and 1= Disagree

	SA	A	U	SD	D
Hardware/Software	5	4	3	2	1
Government agencies like KRA use up-to-date software and hardware to support online public services					
There is a standardized approach to technology procurement and implementation					
Digital Platforms					
The available digital communication tools are sound in terms of technology and functionality					
Cybersecurity measures are in place to protect online government systems and data					
Network infrastructure					
The current network infrastructure and internet provision is reliable and sustainable					
The scalability of the network infrastructure can meet the demands of e-government services					
Data Centers					
KRA has sufficient data center capacity to support the storage and processing needs of e-government data					
The data centers are secure, reliable and compliant with relevant standards					

Section D: Stakeholder Participation

Please answer the following questions to the best of your knowledge. Place a tick ✓ or circle

Where 5=Strongly Agree, 4=Agree, 3= Unsure 2=Strongly Disagree and 1= Disagree

	SA	A	U	SD	D
Government Agencies	5	4	3	2	1
Information systems support the integration of data across different Government agencies					
In government agencies, the resistance to change has an impact on the implementation of system integration					
Taxpayers					
KRA Information systems are leveraged to improve taxpayer experience, to perform tax obligations and access information					
There's effective tax administration through enhanced control and monitoring of taxpayer activities					
Users/staff					
User engagement, training and support are critical for successful integration adoption and satisfaction.					
Measures are available to ensure digital inclusivity for all users/staff including people leaving with disabilities					
Capacity Building					
The absence of digital skills among staff and clients causes a serious inability to participate in system upgrades and integration					
Government involvement in staff training programmes and taxpayer system awareness enhances seamless integration					

Section E: E-government Services integration

1. Can legacy systems in government agencies like KRA be modernized or integrated with e-government newer technologies?

Yes: () No: ()

2. Are different government systems and platforms able to communicate and exchange data seamlessly?

Yes: () No: ()

3. Have government agencies enabled integration with external systems (mobile money, banks) that support user-friendly interfaces and seamless experiences.

Yes: () No: ()

4. Can e-government systems improve transparency, accountability and citizen participation in government processes?

Yes: () No: ()

THANK YOU FOR YOUR PARTICIPATION

Appendix IV: Ethical clearance



KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya
Tel: 254-064-30301/31229/30367/31171

Fax: 254-64-30162
Email: deanrd@kemu.ac.ke

DIRECTORATE OF POSTGRADUATE STUDIES

Our Ref: KeMU/NACOSTI/CIS/02/2024

May 30, 2024

Commission Secretary
National Commission for Science, Technology and Innovations
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: TEJWOK SIMON AJAK (REG. NO. CIS-3-1585-1/2022)

This is to confirm that the above named is a bona fide student of Kenya Methodist University, in the Department of Computer Science, undertaking a Master's Degree in Computer Information Systems. He is conducting research on; "Information Management System Strategies to Support the Integration of Kenya's E-Government Services. A Case Study of the Kenya Revenue Authority".

We confirm that his research proposal has been defended and approved by the University.

In this regard, we are requesting your office to issue a research license to enable him collect data.

Any assistance accorded to him will be highly appreciated.

Yours sincerely,


Dr. John M. Muchiri (PhD)
Dean, Postgraduate Studies

Cc: Dean, SST
CoD – Computer Science
Postgraduate Coordinator - CIS
Supervisors

Appendix V: Nacosti Certificate

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 127706	Date of Issue: 21/June/2024
RESEARCH LICENSE	
	
This is to Certify that Mr.. Tejwok Simon Ajak of Kenya Methodist 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: INFORMATION MANAGEMENT SYSTEMS STRATEGIES TO SUPPORT THE INTEGRATION OF KENYA'S E-GOVERNMENT SERVICES A CASE STUDY OF THE KENYA REVENUE AUTHORITY for the period ending : 21/June/2025.	
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