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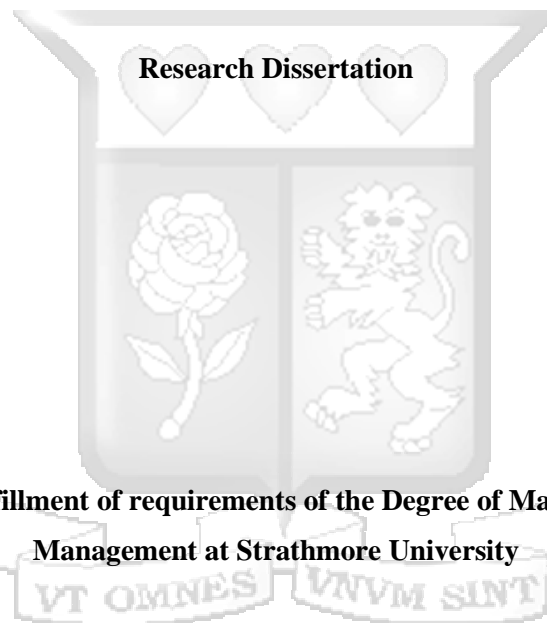
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**CRITICAL SUCCESS FACTORS AFFECTING ADOPTION OF TECHNOLOGICAL
INNOVATIONS AND ITS INFLUENCE ON STAFF PERFORMANCE AND REVENUE
COLLECTION AT KENYA REVENUE AUTHORITY**

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100906



**Submitted in partial fulfillment of requirements of the Degree of Master of Public Policy and
Management at Strathmore University**

Strathmore Business School

Nairobi, Kenya

June 22, 2023

DECLARATION

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

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ABSTRACT

Leveraging technological innovations in tax administration has become an integral part of increasing compliance rates, improving service delivery, increasing the tax base and subsequently revenue mobilisation. In the wake of Kenya Revenue Authority's (KRA) growing thrust to invest in technological innovations for delivering public service value, there is no visibility of adoption rates or evidence of evaluation, documentation or tracking of awareness rates, adoption rates or factors influencing uptake of these technologies internally. There is also no evidence of evaluating the effect of this adoption on work performance or revenue collection. The study sought to investigate factors affecting the adoption of new technological solutions in tax administration with a specific focus on KRA. The specific objectives included to: determine awareness and adoption rates, determine critical success factors for adoption of technological innovations and evaluate the influence of adoption of these technologies on staff performance and revenue collection. This was a cross-sectional study, quantitative in nature, that attempted to test and validate the conceptual framework which combined Adoption of Innovation (DOI) theory and Technology Acceptance Model (TAM) to guide the study. The study population comprised of all 7,955 KRA staff and targeted a sample of 370 respondents determined using stratified random sampling. A structured anonymous online survey was used to collect primary data while secondary data constituted KRA reports and corporate plans. The study involved a theoretical and empirical review of literature relevant to the research objectives and research questions. Descriptive statistics, content analysis, correlation and regression analysis were conducted to help predict the dependent variable given the independent variables. Findings were organised, summarised and presented using tables and graphs to ultimately answer the research questions, provide conclusions, recommendations and areas for further research. Study findings shows that there is high awareness rate and high adoption rate of technological innovations by KRA staff. The critical internal predictors of innovation adoption of systems at KRA were found to be complexity, compatibility with job needs, triability, observability of benefits, good corporate governance around innovation, adopter characteristics of staff and effective communication channels whereas the critical external predictors of innovation adoption by staff were benchmarking and corruption. The study also concluded that adoption of technological innovations has a positive and statistically significant influence on both staff performance and revenue collection and recommends close monitoring of complexity, observability, good governance and corruption as they can lead to adverse effects on adoption by staff.

Key words: *Tax Administration, Tax Revenue, Innovation, Technological innovation, Diffusion of Innovation and Innovation Adoption*

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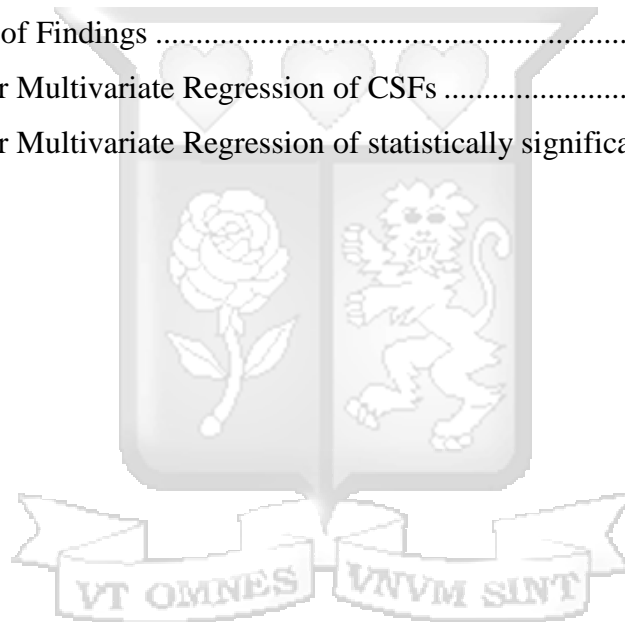
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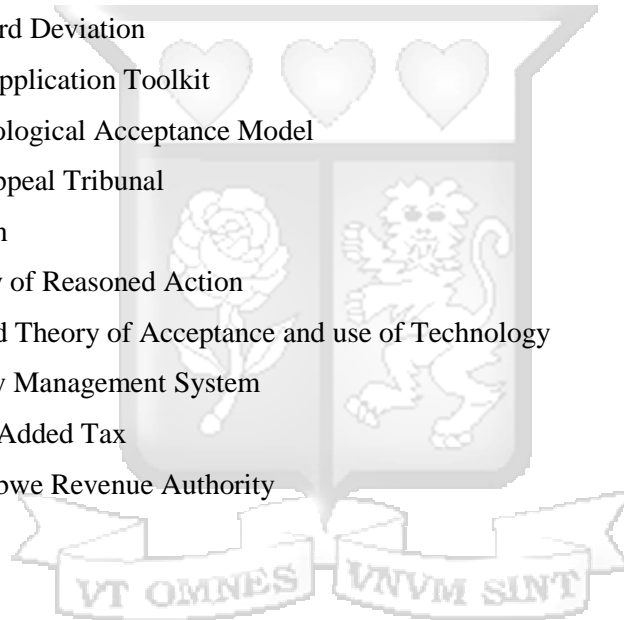
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LIST OF ABBREVIATIONS

ACHIEVE	KRA Performance Management System
AEOI	Automatic Exchange of Information
AI	Artificial intelligence
ANT	Actor Network Theory
ANOVA	Analysis of Variance
ATO	Australian Tax Office
CB – SEM	Covariance-based Structure Equation Model
Coef.	Coefficient
CoPs	Communities of Practice
CRM	Customer Relationship Management
DOI	Diffusion of Innovation
DV	Dependent Variable
EBM	Electronic Billing Machine
EIMS	KRA Ethics Information Management System
Ejuris	KRA Legal Services & Board Coordination management system
ERA	Ethiopia Revenue Authority
ESB	Enterprise Service Bus
Freq.	Frequency
GDP	Gross Domestic Product
iCARE	KRA Customer Relationship Management System
iCMS	KRA Integrated Customs Management System
iConnect	KRA Community of Practice system
ICT	Information & Communication Technology
iKnow	KRA Knowledge Management system
IT	Information Technology
iTax	KRA Integrated Tax Management System
IV	Independent Variable
iWhistle	KRA Whistleblowing system
KES	Kenya Shillings
KRA	KRA
LICs	Low-Income Countries
LoK	Laws of Kenya
Mn	Million
NACOSTI	National Commission for Science Technology & Innovation

Obs.	Observations
OECD	Organisation for Economic Cooperation & Development
PEOU	Perceived ease of use
PSOs	Public Service Organisations
PU	Perceived usefulness
RCTs	Randomised Control Trials
R&D	Research & Development
SARA	Semi-Autonomous Revenue Agency
SBS	Strathmore Business School
Simba	KRA Legacy Customs Management System
SPSS	Statistical Package for Social Science
STATA	StataCorp. Statistical software package
Std. Dev.	Standard Deviation
STK-push	SIM Application Toolkit
TAM	Technological Acceptance Model
TAT	Tax Appeal Tribunal
Tn	Trillion
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and use of Technology
QMS	Quality Management System
VAT	Value Added Tax
ZIMRA	Zimbabwe Revenue Authority



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DEDICATIONS

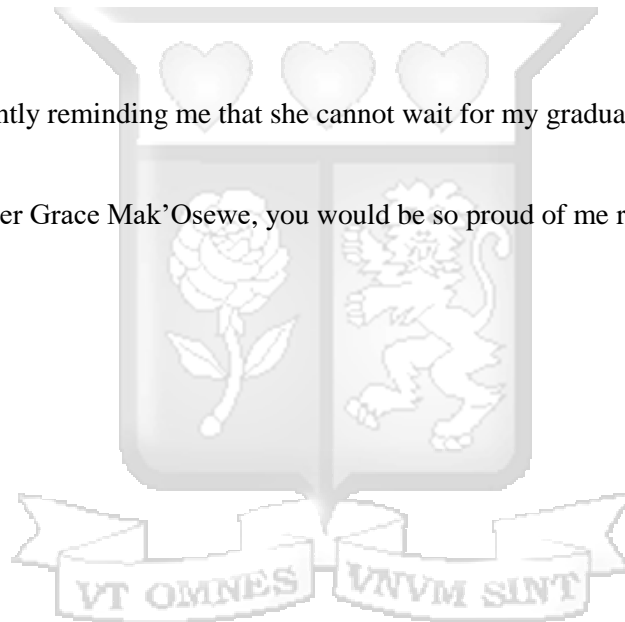
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CHAPTER 1: INTRODUCTION

This chapter starts with the background of the study which touches on public service innovation and how technology has aided revenue collection. It gives examples of technological solutions implemented at KRA in the recent past. It also gives an overview of Kenya Revenue Authority's key mandate and shows briefly the importance of innovation in tax administration. The chapter then goes on to give the problem statement, research objectives and research questions it aimed to answer. Finally, it gives the scope of the study and the target audience to whom the study can prove significant or relevant to.

1.1 Background to the Study

Innovation in the public sector is increasingly becoming popular for achieving efficiency in development objectives. Bessant et al (2014) view it as a *survival imperative* for Public Sector Organisations (PSOs) – implying that, like private sector organisations, either innovate or fail. For Tax authorities, there is a growing need to realise cost saving, gravitate towards customer-centric service delivery and enhance voluntary tax compliance (Barnay et al, 2018). Bessant et al (2014) argue that service productivity stems from novel ways of using existing resources. Tax administrations globally are now embracing innovation as a means of delivering taxpayer value at minimum cost. Maddock (2008) contrasts this survival imperative by arguing that though public officials keep talking about creativity and innovation, few actually tolerate it or take it seriously.

On the one hand, tax administrations are facing increasing pressure to keep up with digital payments, meet higher revenue targets, close the large tax gap and automate processes while working with increasingly constrained funds (Barnay et. al, 2018). On the other hand, social norms and technology are exhibiting a more vocal citizenry, looming threat of privatisation and insufficient human capital. This dilemma has induced the need for tax administration to do things differently and more efficiently through innovation. Bird & Zolt (2008) show how in developing countries, taxpayers and tax administrations must cope with more difficult environments with fewer resources. While national policies and political will are not exactly be supportive of innovation in public sector (Bird & Zolt, 2008), social media is providing an open platform for citizens to demand better service delivery from tax administrations and other PSOs.

Technology has been instrumental in aiding collection of taxes. Tax Authorities around the world have implemented innovative technologies majorly to improve compliance and curb tax evasion. Rwanda implemented the Electronic Billing Machine (EBM) that generates receipts as transactions occur and relays real time data about the transaction (Eissa et al, 2014; 2019). Ethiopia implemented the Electronic

Sales Register Machine (ESRM) on VAT (Respati, 2020). Australian Tax Office (ATO) was a pioneer in cutting-edge lodgement solutions (Turner & Apelt, 2004). In response to this shift in citizen behaviour and anchored on its 8th Corporate plan (KRA, 2021), whose three-year-cycle commenced in July 2021, KRA has implemented various technological innovations with the main objective of increasing compliance with tax and customs laws while providing a high performing environment for employees. KRA is a Semi-Autonomous Revenue Agency (SARA) solely mandated to collect, assess and account for national tax revenue, certain agency levies and customs duties in accordance with Kenya's tax and customs laws and regulations. It currently has 7,955 employees stationed in offices and satellite stations across the 47 counties (KRA, 2021). Established in 1995 through an Act of Parliament, Chapter 469 of the Laws of Kenya (LoK), it administers aspects of 18 Acts of parliament and numerous regulations. The justification for using KRA as a unit of analysis for this study is that it is the sole generator of national revenue in Kenya and a large amount of taxpayer monies go into implementation of these technological solutions. It would therefore, be helpful to establish whether these systems are being used by intended users and provide information for data-driven decision-making as well as give insights for peer learning by other tax agencies and PSOs.

It is noteworthy that some innovations diffuse relatively faster than others for different reasons and under different contexts. From his Kenyan experience, Peterson (1996) summarises four essential factors for successful implementation of IT innovations in public sector centered around decision makers or user: Trust (Does the decision maker or user trust the solution?), Need (Does the decision maker or user recognise the need for the solution?), Help (Does the decision maker or user believe the innovation will be helpful?) and Urgency (Does the decision maker or user believe the innovation is an urgent improvement?).

The emerging issues around how rapidly or whether these systems are being adopted at all, point to internal factors like innovation characteristics (Myers & Marquis, 1969; Rogers, 1995; 2003), adopter characteristics (Frambach, 1993; Kimberly and de Pourville, 1993b; Borins, 2001; Rogers, 2003; Kamal, 2006; De Vries et al, 2015), manager characteristics (Damanpour, 1991; Kearney et al, 2000; Damanpour & Schneider, 2008; De Vries et al, 2015), corporate governance around innovation (Lopez et al, 2018), privacy concerns (Trooshani & Doolin, 2005; Potts & Kastle, 2010), incentives (Rogers, 1995; Hood, 2002; Potts & Kastle, 2010), communication channels (Rogers, 1995; Ishmail, 2006; Tolba & Mourad, 2011) and external factors like external pressures, coercion, government policies or directives (Trooshani & Doolin, 2005), networks, industry associations, political factors (Coven & Levinthal, 1990; Trooshani & Doolin, 2005; Damanpour & Schneider, 2006; 2008; Bird & Zolt, 2008), benchmarking (Stolk & Wegrich, 2008; Potts & Kastle, 2010; Azadegan & Teich, 2010) and corruption (Jenkins, 1996; Bird & Zolt, 2008).

Table 1.1 shows five key innovation characteristics that can influence its adoption according to Rogers (1995).

Table 1.1: Rogers (1995) Definitions of innovation Characteristics

Innovation characteristics	Definition	Generalisation according to Rogers
Complexity	Degree to which an innovation is perceived as relatively difficult to understand and use.	Complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption.
Compatibility	Degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters.	Compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption.
Triability	Degree to which an innovation may be experimented with on a limited basis.	Triability of an innovation as perceived by members of a social system, is positively related to its rate of adoption.
Observability	Degree to which the results of an innovation are visible to others.	Observability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption.
Relative Advantage	Degree to which an innovation is perceived as better than the idea it supersedes.	The Relative Advantage of an innovation, as perceived by members of a social system, is positively related to its rate of adoption.

Source: Rogers, 1995

Table 1.2 shows environmental, organisational and innovation factors that are likely to influence adoption according to Troshani and Doolin (2005).

Table 1.2: Troshani and Doolin (2005) Factors likely to influence innovation adoption

Environmental Context Factors	Organisational Context Factors	Innovation Factors
External pressures	Human capital and education	Perceived relative advantage
Culture	Management attitudes	Perceived costs
Legal Issues	Resources	Compatibility and complexity
Government		Observability and triability
Industry associations		
Successful adoptions		

Source: Troshani and Doolin, 2005

Out of these factors, the study attempted to identify the Critical Success Factors (CSFs) for adoption of these technologies. These issues bring into perspective the construct of diffusion of innovation models and the influence of this adoption on staff work performance and revenue mobilisation.

1.1.2 Importance of innovation to Tax administrations

Public Sector Organisations (PSOs) innovate for a variety of reasons. Potts and Kastle (2010) suggest five reasons for public sector innovation: (i) economic growth manifested through productivity growth; (ii) achievement of specific problem-solving objectives through new pathways or institutional arrangements; (iii) benchmarking through comparison with best practice; (iv) to keep up with technological advancements; and (v) evolving public-private institutional partnerships. De Vries et al. (2015) bring to light five prominent public sector innovation goals: effectiveness, efficiency, tackling societal problems, customer satisfaction and involving stakeholders.

Tax agencies have in the past implemented technological innovations for countless reasons commensurate with their agendas. Jenkins (1996) says that since 1980s countries implemented IT tax reforms for various reasons: Spain for admission to the European Community, Mexico to break corruption cycles and Canada to modernise its indirect tax regime. In all these cases, “information technology has been used to increase the quantity and quality of information available to tax administrations.” Now more than ever, the digital boom has necessitated tax administrations to transform or become an ‘entropic drag’ as Potts and Kastle (2010) would call it.

Another reason would be to minimise tax evasion through guaranteeing paper trail crucial for any self-assessment tax regime (Pomeranz, 2015). Barnay et. al (2018) report that tax authorities are innovating in four areas: digitised interactions, advanced analytics, process automation and talent management. Tax administrations like Australia Tax Office (ATO) are adopting disruptive technologies like block chain and Artificial Intelligence (AI) (Turner & Pelt, 2004) to improve efficiency and eliminate redundancies. According to Rajagopal (2001), many organisations globally have managed to attain high levels of performance due to adoption of Information Technology (IT) solutions.

KRA innovates with an aim to implement its transformation and tax base expansion agenda. For KRA, innovation is important for simplifying the tax process, cost saving, improved global ranking, increasing public confidence and maximising revenue gains. Like other African tax agencies, it has realised the critical role technology plays in efficient tax collection and improved taxpayer service delivery. The push to innovate has been brought about both by this internally-driven realisation to create public value as well as the external need to become the ‘best-in-class’ on a global scale. However, Potts & Kastle (2010) state that failure to innovate rarely has devastating consequences in public sector. Hence, the SARAs must make an intentional decision to innovate.

In its resolve to move from manual to a paperless, KRA has over the years leveraged on technology and data-driven innovations to improve internal efficiency and voluntary compliance. Something Bird & Zolt (2008) call, “From Hand to Mouse”. As such, it has continued to institutionalise over 27

technological innovations from 2005 to date (KRA, 2021). Table 1.3 shows 15 such innovative technological solutions that formed the basis of investigation in this study.

Table 1.3 KRA Technological Innovations implemented between 2005 and 2021

	System Name	Description	Year of Inception / Roll-out
1.	'Simba' Customs System	Customs system for lodgement and processing of Customs import / export entry documents	2005 (Enhanced 2020)
2.	'iTAX' system	Integrated web-based revenue collection system for electronic registration of taxpayers, electronic filing of returns, payment of taxes and viewing ledger accounts.	2013 (Enhanced 2021)
3.	New KRA Website	Revamped Official KRA website	2017
4.	iKNOW	An internal electronic platform where knowledge resources like reports, plans, videos, presentations, public notices, rulings, technical profiles and research papers are published and are accessible to all KRA staff.	2017
5.	iConnect	A collaborative knowledge-sharing platform which allows KRA staff to interact with each other within Communities of Practice (CoPs) or locate and interact with Subject Matter Experts (SMEs) in different tax-related fields.	2017
6.	iINNOVATE	An electronic crowdsourcing system for submitting new innovative ideas, evaluating the ideas using laid-down criteria and tracking the ideas from conceptualisation to implementation.	2017
7.	Team Central	KRA's internal / routine audit tracking system	2017
8.	Quality Management System (QMS)	KRA's quality management system used for tracking quality management audit issues and addressing the non-conformities	2017
9.	iCARE	KRA's Customer-Relationship-Management (CRM) System	2017
10.	Ethics Information Management System (EIMS)	An internal electronic system where staff declare gifts received or given out in an official capacity and any conflict of interest in individual or group assignments.	2018
11.	KRA-Hub	Enhanced internal intranet site where staff can access information about internal issues	2018
12.	'iCMS' (Integrated Customs Management System)	A new Integrated Customs management system that allows for entry lodgement & processing, cargo tracking and	2019
13.	'iWhistle'	KRA's electronic Whistleblowing platform	2020

14.	Ejuris	A new platform for registering legal assistance and support from the Legal department	2021
15.	ACHIEVE	KRA's new Performance Management system for recording and tracking tasks and targets, real-time & objective performance appraisal and feedback management.	2021

Source: KRA, 2021

Though not exactly new to the world, the above systems are either relatively new to KRA or recently been enhanced. According to OECD (2005) Oslo manual the minimum requirement for an innovation to be considered an innovation is that it must be new (or significantly improved) to the firm. Prahalad (2012) lauds this by saying that implementation of basic technologies in Low-Income Countries (LICs) can have a greater impact than adopting new technologies.

1.2 Problem Statement

To support the new impetus towards using technology for a more customer-oriented approach and closing the 'compliance gap', innovation has become an indispensable aspect of making tax compliance simpler and more efficient. In response, KRA has implemented over 27 technological solutions since 2005 (KRA, 2021). However, there is no visibility of adoption rates or evidence of evaluating, documentating or tracking of awareness rates, adoption rates or factors influencing uptake of these technologies by KRA staff. There is also no evidence of evaluating the effect of this adoption on staff performance or revenue collection. Large investments (taxpayer monies) go into implementing these technological solutions. It would therefore help to track awareness rates and adoption rates of these technologies, frequency of their use or impact of their use on performance and revenue. Increased levels of awareness and adoption are likely to lead to enhanced staff performance and revenue collection. This will provide data that policy makers and senior level management can use to make informed decisions when allocating resources to implementation of IT solutions.

Knowing the internal and external factors that will enable or inhibit usage of new systems can help solve this problem. The underlying issues to this problem include complexity and other innovation characteristics, leadership, corporate governance and innovation culture, adopter characteristics, manager's characteristics, threats to privacy, or lack of supportive internal innovation policies among others. Bird & Zolt (2008) talk of political will as a possible influence on adoption. Peterson (1996) shows that in Kenyan tax administration, successful adoption of new technologies is susceptible to resistance by staff. Further classifying these factors into Critical Success Factors (CSFs) can help determine those factors that need to be closely observed as they may have adverse effects on adoption rates as well as the influence of this adoption on staff performance and revenue collection.

1.3 Research Objectives

The overarching purpose of this paper was to investigate the awareness rates, adoption rates and the factors affecting adoption and evaluate the influence of adoption on staff performance and revenue collection within the context of tax administration. The specific study objectives included to:

1. Determine the awareness rate and adoption rate of technological innovations at KRA.
2. Identify the Critical Success Factors for adoption of technological innovations at KRA.
3. Evaluate the influence of adoption of technological innovations on staff performance at KRA.
4. Evaluate the influence of adoption of technological innovations on revenue collection at KRA.

1.4 Research Questions

The following four specific research questions helped guide analysis of the study:

1. What is the awareness rate and adoption rate of technological innovations at KRA?
2. What are the Critical Success Factors (CSFs) for adoption of technological innovations at KRA?
3. To what extent does adoption of technological innovations influence staff performance at KRA?
4. To what extent does adoption of technological innovations influence revenue collection at KRA?

1.5 Delimitation/ Scope of Study

This study was an explanatory study investigating aspects about adoption of technological innovations in tax administrations. Through data collection and analysis, it attempted to evaluate the factors influencing adoption of technological innovations at KRA. The study aggregated data at individual and departmental level and employed descriptive statistics such as measures of central tendency (e.g., mean), measures of dispersion (maximum, minimum, frequency and standard deviation) e.g., t-tests, F-test and ANOVA (Analysis of Variance) and content analysis to analyse data obtained from questionnaires. This provided good lessons on issues surrounding adoption of innovative technologies in tax administration.

The study took approximately 4 months from the time questionnaires were sent to respondents to the time the survey was closed, data collated, cleaned and analysed. It covered a data duration for systems implemented and/or enhanced between 2005 and 2021 - from inception of the first revenue management technology to date. The study covered all 13 KRA departments distributed across all KRA regional and satellite stations across the country. Through stratified random sampling of staff from all the departments, all stations were reached hence provided a representative sample of the KRA population.

It covered a total of 15 technological systems listed in table 1.3. Since these innovations have already been implemented and recently been enhanced, this study only concentrated on secondary adoption i.e., adoption by the individuals within the organisation and not primary adoption i.e., adoption by the organisation itself. This study did not evaluate the effectiveness of any of the 15 technological systems.

1.6 Significance of Study

1.6.1 KRA & Other Tax Administrations

This study is important to KRA and other tax agencies globally as it gives insights on critical areas of tax administration, innovation and tax policy considerations in an African context. The study has attempted to give a better understanding on how to deal with challenges currently being experienced by internal stakeholders when either accessing technological innovations or trying to innovate. Assessing adoption of KRA's technological innovations and related novel initiatives can make the Authority more pro-active rather than reactive to emerging challenges and opportunities. It can also give peer learning from solutions that one agency has adopted and the other has not adopted that can be beneficial to the Agency.

1.6.2 Policy Makers

The study can help policy makers to better understand the public sector innovation environment and its potential to improve efficiency in public service delivery. It is hoped that it can help policy makers get a better understanding of the role of innovation adoption and critical success factors for adoption of technological innovations in tax administration within different cultural and economic contexts. It can also provide evidence-based approaches to improved innovation policy formulation not only for tax policy, but also for public sector innovation policy. Insights from this study can also be useful for decision makers within KRA when drafting its ICT Strategic plans and policies.

1.6.3 County Governments

The 47 county governments established under the constitution of Kenya (2010) are mandated to generate and collect county revenue. As county leadership seek to gain a competitive advantage and

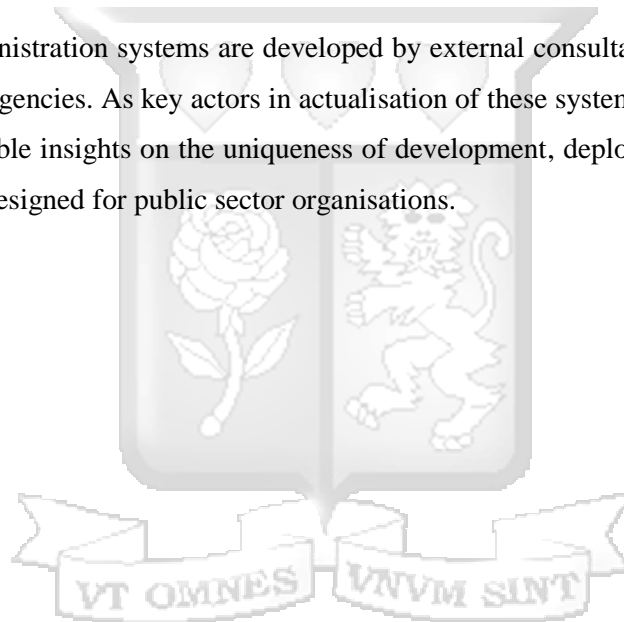
investor confidence both locally and international, this study can provide information on critical issues and user needs to consider when instituting new technological systems at county level.

1.6.4 Academia

This study can prove useful to students and scholars as it pinpoints areas for further research in the field of public service innovation in Kenya and Africa. It also contributes to the currently underdeveloped knowledge base in the field of public service innovation in Africa. Innovation studies is a widely recognised field of study in the developed world, but has not gained much traction in developing countries (Fagerberg & Verspagen, 2009; Martin, 2012).

1.6.5 Information Technology (IT) Professionals

Many of these tax administration systems are developed by external consultants, software developers or partner government agencies. As key actors in actualisation of these systems, it is expected that this study has given invaluable insights on the uniqueness of development, deployment and user needs of technological systems designed for public sector organisations.



CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter defines significant terminologies and gives the theoretical and empirical review of literature which explores relevant theories and research gap(s) and concludes with the conceptual framework which gives the conceptual model and explains operationalisation of variables within the model to help give direction for the study.

2.1.1 Definitions

Tax administration can be defined as the processes and procedures of collecting and enforcing tax revenues through administering a set of laws or Acts and regulations that form the basis of a tax system (Mansfield, 1988; Alink & Kommer, 2016). Though they vary from country to country, tax agencies are mandated by law to administer taxes through implementation and enforcement of tax laws (Alink & Kommer, 2016). It encompasses the use of laid down processes, procedures and regulations for managing and enforcing these tax laws.

Tax revenue is payment obtained from taxpayers arising from tax liabilities. OECD (2021) confines the definition of the term “taxes” to “compulsory, unrequited payments to general government...” unrequited” meaning benefits provided by government in return is not proportional to these taxpayer payments. The OECD methodology classifies taxes according to the tax base upon which tax liability is charged i.e., income, profits, capital gains, payroll, property, goods and services.

‘Innovation’ is defined as a process through which new ideas, objects and practices are created, developed, reinvented and which are new for the unit of adoption (Rogers, 1995, Walker 2008; Wischnevsky et al., 2011). In the OECD (2005) Oslo Manual, an *‘innovation’* is defined as “the implementation of a new or significantly improved product, or process, a new marketing method, or a new organisational method in-business practices, workplace organisation or external relations.” Dopfer and Potts (2008) have a market economy definition of innovation seen as a ‘three-phase’ process: origination (creation of a new idea through invention, search, discovery and recognition); adoption (individual process driving market selection in an uncertain or path dependence environment) and retention (actualisation or institutionalisation of a novel idea in an existing regime). Damanpour and Schneider (2008) states that researchers have generally defined *‘innovation’* as the development (generation) and/or use (adoption) of new ideas or behaviours. According to Walter (2008), in order to understand innovation adoption, it is essential to distinguish different innovation types. The OECD

(2005) Oslo Manual gives four types: product innovations, process innovations, marketing innovations and organisational innovations. Gershon (2015) talks of three key types: product, process and strategic innovations which take place in three ways either as radical (doing something completely new), incremental (doing something better) or current innovations. The general consensus is that innovation entails coming up with something new to an institution.

Adoption of an innovation is the actual use of something by an intended user and has been studied widely, with numerous references made to Rogers (1995; 2003) works. In these studies, the word ‘diffusion’ is often used interchangeably with the word ‘adoption’. It is therefore, important to define the two terms. Rogers (1962) defines ‘*adoption*’ as “the spread of an idea from its source of invention to its ultimate users or adopters”. According to Rogers (2003), ‘*diffusion*’ is “a process in which an innovation is communicated through certain channels over time among the members of a social system” whereas ‘*adoption*’ is “the voluntary and/or coercive process through which an organisation/ individual passes from first knowledge of an innovation, to forming an attitude towards the innovation, to a decision to adopt or reject, to implementation of a new idea, and to confirmation of this decision (Rogers, 2003).” Turner (2002) defines adoption as the government’s incorporation of an innovation in its policy. ‘Adoption’, as defined by Damanpour and Schneider (2008), is a process that results in assimilation of a product, process, or practice that is new to the adopting organisation. Ahmed and Shepherd (2012) use one term to define the other - diffusion as the movement and adoption of an innovation. According to various studies (Zaltan et al., 1973; Russell and Hoag, 2004, Troshani and Doolin, 2005; Kamal, 2006), innovation adoption occurs in two stages: Primary adoption (adoption by the organisation) and secondary adoption (adoption by individual users). This study focused on secondary adoption only and the two words i.e., ‘diffusion’ and ‘adoption’ were used interchangeably.

Technological innovation is considered as a subset of process innovation and are made of or rely extensively on two components: (i) a *hardware* aspect that consists of the tool that embodies the technology as material or physical objects, and (ii) a *software* aspect that consists of the information base for a tool (Rogers, 1995; Joseph, 2010). They are those new innovations that embody inventions from industrial arts, engineering, applied sciences and/or pure sciences (Garcia & Calantone, 2002). Schilling (2005) defines technological innovation as, “the act of introducing a new device, method, or material for application to commercial or practical objectives.” An OECD (2010) report on measuring innovation warns that using the terms ‘technological’ or ‘non-technological’ innovations are oversimplifications that can be potentially misleading. Schmidt and Rammer’s (2007) define non-technological innovations as the introduction of new organisational methods or the introduction of new market methods. “Technological innovation is one of the driving forces of modern capitalism, and arguably the main one (Tylecote & Visintin, 2007).”

2.2 Theoretical Review

Theories on adoption of innovation can be broadly divided into two: Demand-Side (Adopter-Side) models which are mainly statistical in nature. For instance, Epidemic, Bass, Probit, or Bayesian models; or Supply-side (Inventor-Side) Models which are mainly sociological. For instance, Appropriability, Dissemination, Utilisation, or Communication models (Tidd, 2006). Epidemic models are the most widely used theories. This study used a blend of Rogers (1995) **theory of Diffusion of Innovation (DOI)** and Davis (1989) **Technology Acceptance Model (TAM)**.

2.2.1 Awareness rate and adoption rate of technological innovation

In line with Rogers (1962) **theory of Diffusion of Innovation (DOI)**, potential users need to first be aware that these new solution exists so as to make the decision to use or not to use it. The **DOI theory** talks of five mental stages individual(s) in a social system pass through before accepting and adopting an innovation: (i) *knowledge* - awareness of the innovation; (ii) *persuasion* – persuade potential users of merits; (iii) *decision* – making the choice to adopt, reject or delay use of an innovation; (iv) *Implementation* – actually using the innovation and (v) *confirmation* – validating one’s decision to adopt. The DOI theory gives direction on measuring innovation adoption rates, innovation enablers & inhibitors and innovation culture which guided the study and development of the conceptual framework. Kamal (2006) supports this theory and devices a 3-step model which an individual goes through before fully adopting an innovation once implemented by the government organisation: (i) confirmation of innovation idea, (ii) User acceptance of innovation, and (iii) actual use of innovation.

The ‘*Adoption rate*’ or ‘*Rate of adoption*’ is defined by Rogers (1995) as the relative speed with which an innovation is adopted by members of a social system. Measured by the number of members who adopt a new idea in a specific period, the rate of adoption is the numerical indicator of the steepness of the adoption curve...” resulting in an S-shaped curve (Rogers, 1962). Gershon (2015) defines *rate of adoption* as the length of time required by someone to consider and adopt the use of a new technology or service. Targeted users tend to exhibit certain behaviours when going through the decision process. Rogers (1995) depicts these adopter behaviours using the bell-shape curve to show five adopter categories: Innovators (enthusiasts with high risk tolerance), Early adopters (high prestige influencers who adopt when the item becomes available, but more discerning), Early majority (large segment of the population with a cautious approach), Late majority (change-resistant individuals with a high degree of scepticism), and Laggards (last adopters usually reluctant to spend resources). He theorised that these 5 groups i.e. innovators, early adopters, early majority, late majority and Laggards typically take up 2.5%, 13.5%, 34%, 34% and 16% of the population of a social system respectively. This adopter

categorization is based on what Rogers calls the adopter's '*innovativeness*' defined as the degree to which an individual is relatively earlier in adopting new ideas than other members of a social system.

Study by Carter and Belanger (2005) supported Rogers' Model whereas Tidd (2006) argues Rogers' model provides little guidance for measuring future patterns of innovation adoption. He adds that precise patterns of innovation diffusion depend on both the demand side models and the supply side models. On the contrary, Rogers (1995) gives guidance on innovation attributes that are best for predicting innovation adoption. However, Moore (1991) argues that there is a chasm between early adopters (visionaries) and early majority (pragmatists) and that technology adoption lifecycle does not always take the bell-shape. Studies show that the DOI theory is applicable for national and local governments that have realised cost reductions and improved public value through implementation of e-government solutions (Carter & Belanger, 2005).

2.2.2 Critical Success Factor for DOI

Challenges of adoption of technological innovations is hardly unique to the 20th Century (Fine, 1986) let alone the 21st Century. Historically, resistance to adopt new technological innovations were more aggressive like protests whereas today's resistance or other factors impeding adoption are more passive. Studies by Wolfe (1994) and Troshani and Doolin (2005) emphasize the importance of understanding opportunities and challenges of adoption as it aids identification of enablers or inhibitors which can be useful in policy making and incorporation in adoption programs. Limited budget to cover recurring costs can be unfavourable to innovation adoption especially with regards to marketing and awareness creation (Troshani & Doolin, 2005).

According to Rogers (1962) the adoption rate depends on 5 key factors which are tied to the features of the innovation in question also referred to as 'innovation characteristics': (i) complexity, (ii) compatibility, (iii) triability, (iv) observability and (v) relative advantage. He theorised that innovations move through the adoption process in an S-Shape. Innovation characteristics are among the five key variables that determine the rate of innovation adoption according to Rogers (1995) DOI theory:

1. Perceived attributes of the innovation (Innovation characteristics).
2. Type of innovation decision (Optional, Collective and Authority)
3. Communication channel (e.g., Mass media or interpersonal)
4. Nature of social system (norms, values, degree of interconnectedness, networks, incentives, governance, etc.)
5. Extent of Change Agents' promotion efforts (Opinion leaders, champions, manager, etc.)

To link the theoretical review to the research objectives and conceptual framework, in addition to the 5 innovation characteristics above, the study focused on an optional decision process by the individual staff, dependent on KRA's institutional norms, rules and influences from internal change agents (champions, opinion leaders, managers, etc.). The study also borrowed the following factors from Roger's (1962) DOI theory: Adopter characteristics (champions, adopter categories i.e. innovators, early adopters, early majority, late majority and Laggards), manager characteristics – managers are seen as change agents, corporate governance around innovation, incentives, communication channels and external pressures such as government policies/ directives, coercion, networks, political factors among others.

Factors influencing adoption are numerous, but not all of them are significant enough to warrant certain strategic decisions hence the study aimed to establish those factors that can be considered critical within a tax administration context. A Critical Success Factor (CSF) is a factor or element that must be observed or fulfilled in order for the innovation adoption process to be successful. Bruno and Leidecker (1984) define CSF as, “those characteristics, conditions or variables that, when properly sustained, maintained or managed, can have significant impact on success...”. Kamal (2006) identifies a total of 42 Critical Success Factors for IT innovation adoption in government organisations, few among them being: Roger's innovation characteristics, organisational performance & structure, IT capability, championship, management style, managerial capacity, social attitude, politics, innovation capacity, productivity, stakeholder / user participation, external influence, and consultant or vendor. He further proposes that there is still need for further refining and testing of these factors under different public agencies and identifying interrelationships between these factors.

Arce and Flynn (1997) emphasize the importance of looking at dimensions of Critical Success Factors (CSFs) in terms of whether they are internally or externally oriented. They state that, “an internal CSF has related actions taken within the organisation, while an external CSF has related functions performed outside the organisation. The seven (7) **internal factors** affecting adoption of innovation covered under this study included: Innovation characteristics, adopter characteristics, manager characteristics, perceived threat to privacy, corporate governance, incentives and communication channels and are discussed below.

Innovation Characteristics: Myers and Marquis (1969) highlights that the characteristics of an innovation will affect its use. According to them, factors that affect innovation adoption include: Technical factors; Desire to use the work of R&D Departments; Marketing Factors; Demands of Customers; Characteristics of the innovation; Education and Experience of the adopter; Widely shared information; and personal contacts. The radical or incremental nature of an innovation can also affect adoption (Rogers, 2003) as they require more effort to generate awareness, acceptance and adoption.

According to Myers and Marquis (1969), adoption may even be more important in major path-breaking innovations. Venkatesh et. al's (2003) 'performance acceptance' element is said to be the same as relative advantage. Damanpour and Schneider (2008) point out that the role of innovation characteristics on innovation adoption in organisations has not received much research attention. The hypothesis testing for this study was derived from Rogers (1995) generalisations on complexity, compatibility, observability, triability and relative advantage.

Adopter Characteristics / Opinion leaders / Champions: Rogers (2003) classifies adopter characteristics as: innovators, early adopters, early majority, late majority and Laggards. Champions or individuals who are innovative or enthusiastic are more likely to adopt or influence adoption of new innovations (Borins, 2001; De Vries et al., 2015). Kimberly and de Pouvourville's (1993b) define 'Champions' as "people who are resolute supporters of an innovation, evident in their preparedness to "invest" extraordinary amounts of personal time, energy, and reputation to ensure its implementation." Champions have organisational clout and can be used for advocacy or spearhead aggressive awareness campaigns (Frambach, 1993; Troshani & Doolin, 2005; Damanpour & Wischnevsky, 2006; Kamal, 2006). Kamal (2006) states that a champion can positively impact IT adoption in public sector more so if the champions are top level or role models of targeted users. However, effectiveness of champions in influencing adoption is largely dependent on their ability to mobilise resources and develop strong internal networks (Clegg et al, 1996; Turner & Apelt, 2004; Bessant and Philips, 2013). Azadegan and Teich (2010) note the network size as a key factor for technological adoption. Myers and Marquis (1969), on the other hand, argue that adoption is more likely to happen through information received through personal contacts rather than through training provided by champions.

Manager characteristics: Characteristics of Managers or supervisors are also likely to affect adoption of a new technology. Job-related knowledge, skills, professionalism, and age are some manager characteristics likely to affect adoption or even advocacy (Damanpour, 1991; Damanpour & Schneider, 2008; De Vries, 2015). Older managers have a propensity to be comfortable with prevailing conditions hence may be less willing to embrace any IT solution that will disrupt the status quo. Also, managers' demographic characteristics had far less influence on the innovation adoption in public sector than the managers' personal characteristics while political orientation of the manager can significantly influence innovation adoption. Managers' education and intellectual capacity positively influenced innovation adoption (Kearney et al, 2000). Respati (2020) found no significant relationship between educational attainment and adoption. Damanpour and Schneider (2008) demonstrate a relationship between innovation characteristics, manager characteristics and innovation in public organisations.

Perceived threat to privacy: Tax administrations are obligated to ensure the observance of taxpayer privacy rights (OECD, 2019). Potts and Kastle (2010) highlights how perceived threat to privacy may

be a major yet much less researched constraint on adoption of innovation technologies in public sector. Privacy concerns are prevalent and with the dawn of global data protection, threat to privacy and how it affects adoption of technologies was a key concern for this study and may be for future studies. Troshani and Doolin (2005) argue that privacy is a major concern when innovations are associated with the internet.

Corporate Governance involves a set of relationships between a company's management, its board, its shareholders and other stakeholders and provides the structure for setting organisational objectives, means of attaining those objectives and monitoring performance (OECD, 2015). Tylecote & Visintin (2007) define corporate governance as the set of relationships that control firms and how it provides strategies and direction for fostering a culture of innovation and monitoring innovation performance. Lopez et al (2018) conduct a comprehensive theoretical review of the association between corporate governance and innovation with a focus on the ownership of institutions based on a set of relationships from board level. This study focused on a similar set of relationships but at senior management level and how these management decisions and policy influence innovation adoption.

Reward & Incentives can be given to potential adopters to woo them to use the technological innovation. Whereas Rogers (1995) concentrated more on adopter incentives from a positive or "carrot" perspective in cash or kind, he also points out that incentives can be negative. Public officials face punishment for failures and get rewards for competently doing only what they have always done (Potts and Kastle, 2010). Media and public scrutiny and existing accounting mechanisms in public service leads to preclusion of structural incentives like reward and incentives for innovations evident in private sector innovation cycles (Hood, 2002).

Communication channels are essential for creating awareness and positive perception about an innovation's benefits (Tolba & Mourad, 2011). Individuals may not even realise that they have an actual need for the innovation until they are made aware of it (Rogers, 1995). Communication campaigns aimed at creating awareness helps targeted users know that they even have a need. Both anecdotal and empirical studies have shown the integral part communication channels play in the adoption process (Rogers, 1995; Ishmail, 2006). Ishmail (2006) identifies four critical elements in adoption of innovations: Uncertainty, communication channels, time and the social system.

The three (3) **external factors** affecting adoption of innovation covered under this study included: External pressures, benchmarking and corruption and are discussed below.

External Pressures / Coercion / Government policies / directives: Tax administrations receive mandatory government directives with clear timelines for delivery. Potts & Kastle (2010) suggest that

the actual 'customer' is higher political orders or is driven by internal career progression games, and not the user whom the technological solution is professed to serve. At KRA usage or system adoption is triggered by internal memos circulated to all staff to comply within specified timelines and these can have negative or positive effects. Fine (1986) forewarned that coercion or manipulation begets manipulation.

Networks, industry Associations & political factors: External networks are as important as internal networks. Networks and industry associations can open possibilities for benchmarking and access to third party data which can bolster innovation. Cohen and Levinthal (1990) acknowledge that a combination of internal R&D with external knowledge yields higher returns than activities conducted in isolation. Personal contacts in the industry can provide access to resources for peer learning. In addition, political interests and good will can impede or propel adoption depending on the regime's agenda. Public sector organisation experience short term pressures associated with politics and need for public support (Damanpour and Schneider, 2006; Bird and Zolt, 2008; Damanpour and Schneider, 2008). The political process is especially important when it comes to the decision to allocate scarce resources to a particular innovation (Damanpour and Schneider, 2008). Public sector has to work within budget constraints and political coalitions that they do not want to offend in the process of innovating (Potts and Kastle, 2010). On the bright side, high levels of external pressures can positively impact innovation adoption in government organisations (Kamal, 2006).

Benchmarking: Public sector management try to benchmark because the sector does not have competition and does not encourage experimental learning due to equity issues, media and opposition monitoring (Potts and Kastle, 2010). Tax administrations benchmark with other agencies to allow for international comparison or gauge their performance against their counterpart agencies (Stolk & Wegrich, 2008). By doing this, public officials can witness and learn the benefits of adopting a certain innovation. Azadegan and Teich (2010) show practical implications of benchmarking on the technology, the adopter, the provider and the network factors. However, some benchmarking initiatives are accused of putting more emphasis on the differences between tax administrations rather than give recommendations on the way forward.

Corruption: Transparency International (2019) defines corruption as 'the abuse of entrusted power for private gain. It can be classified as grand, petty and political, depending on the amounts of money lost and the sector where it occurs.' There is a general consensus in many definitions of corruption summarised as using public office for private gains (Jenkins, 1996; Bahl and Bird, 2008; TI, 2019). However, Heidenheimer and Johnston's (2002) edit of John Gadiner's book, highlights the differences in definition of the word as defined by official laws of the nation, as defined by how it affects the public and as defined by the public. The Anti-Corruption and Economic Crimes Act (2003) Laws of Kenya

(LoK) defines corruption as ‘(a) an offence under any of the provisions of section 39 to 44, 46 and 47; (b) bribery; (c) fraud; (d) embezzlement or misappropriation of public funds; and (e) abuse of office’.

Though corruption has been pitted with major negative implications both to the organisation and the nation, there are some scholars who argue that corruption can have positive effects on economic structures (Golla, 2009). E-government can lower compliance costs which in turn lowers the potential of corruption as it lowers bribe amounts taxpayers are willing to pay to corrupt officials (Bahl and Bird, 2008). Corrupt officials are therefore, likely to resist adoption of an innovation that will reduce their chances of receiving bribes. Studies have shown how public staff are hesitant to use new technology because it is likely to close corruption loopholes, reduce human discretion and increase transparency (Jenkins, 1996; Bird and Zolt, 2008).

2.2.3 Influence of Adoption on staff performance

To conceptualise the influence of adoption on staff performance, the study borrowed from **Technology Acceptance Model (TAM)** introduced by Fred Davis in 1985 with a later study in 1989. The TAM theory explains the process of information systems adoption through attitudes and behavioural intention and views innovation adoption based on two key perspectives: (i) ‘Perceived Usefulness’ (PU) and (ii) ‘Perceived ease of Use’ (PEOU). PU is defined as, “the degree to which a person believes that using a particular system would enhance his or her job performance” He adds that it does not matter how easy an innovation is to use if the potential user does not see its benefits in increasing their work productivity. Whereas PEOU is defined as, “the degree to which a person believes that using a particular system would be free of effort (Davis, 1989). DOI’s theory construct of complexity is fundamentally similar to TAM’s PEOU (Carter and Belanger, 2005). Carter and Belanger (2005) say TAM is widely used to study user acceptance of disruptive technologies, but claim that this method of assessment can be subjective. As its name suggests, TAM is specifically designed for and therefore limited to technological innovations (Gallivan, 2001). Ward (2013) recognises TAM’s weakness in predicting individual’s behaviour and recommends that future models need to consider organisational and human factors. Results from Carter & Belanger (2005) who applied the TAM model, indicate that perceived ease of use, compatibility and trustworthiness are indicators of intent to use e-government solutions. Gallivan (2001) interestingly highlights the differences between DOI and TAM i.e., DOI uses five perceived factors while TAM uses only two; DOI has a broader focus explaining how communication channels and opinion leaders shape adoption whereas TAM has a narrower focus on predicting acceptance and usage by target users.

2.3 Empirical Review

The empirical review is organised according to issues under the four research objective.

2.3.1 Awareness rate and Adoption rate of technological innovations

Kisang & Rotich (2014) study aimed at establishing the challenges facing adoption of e-procurement applications by KRA procurement staff with a focus on system effectiveness, capability and efficiency. It targeted a population of 200 and sampled 170 respondents from the procurement department using questionnaires for primary data collection. A combination of E-procurement Adoption Model (EPAM) matrix which entails 8 change phases depicted horizontally and 7 roles for individual adoption depicted vertically, Utterback's (1979) Conventional model of technology lifecycle and Dosi's formulation theory of adoption was used. Findings showed technical hitches and top level can significantly hinder use of procurement applications. Staffs lack of system knowledge can also lead to ineffectiveness of the procurement process. The study concluded that though it's beneficial to invest in IT, PSOs should note that a system's inefficiency can hinder its adoption and recommended that PSOs should fully automate procurement processes while exercising caution.

Gor (2015) focused on adoption of 'iTax' System by medium tax payers and employed a combination of DOI, TAM and Theory of Reasoned Action (TRA) theories. The study took on a descriptive research design whose objectives focused on how perceived usefulness and perceived ease of use of online filing affected adoption. It attempted to show how social systems influence adoption targeting a population of 474 medium taxpayers with a sample size of 142 determined using a convenience sampling technique. Study findings concluded a positive increase in relative advantage, complexity, compatibility, system support and social networks positively and significantly influence adoption of online filing by taxpayers. It recommended using a blend of theoretical frameworks in adoption research and that KRA should understand taxpayer tech adoption behaviour and offer supportive environment which promotes innovation among top leadership. Further research is needed to identify additional factors for adoption, broaden scope of study to include other taxpayer groups and add variables to improve understanding of adoption predictors.

Respati's (2020) scoping review paper aimed at ascertaining what works for successful adoption of e-government in tax administration. Key objectives were to establish: (i) Purpose of adopting e-government, (ii) Types of technology used for tax procedures, (iii) Adoption and acceptance factors for e-government, (iv) Impact of e-government in tax services, and (v) challenges and barriers. The author reviewed 6 electronic databases and reported 10 out of 79 empirical articles reviewed and used Arksey & O'Malley's (2005) 5-stage framework of scoping to screen articles. Adoption theories identified through this review included: Delone, McLean and Seddon's Instrument, E-equal Instrument, UTAUT model, TRA and Theory of Planned Behaviour (TPB) among others. Findings show that: (i) key

purposes of e-government adoption were: convenience, reduce compliance cost, enhance officers' performance, increase revenue, minimize evasion, , and reduce corruption; (ii) types of tech systems adopted were mainly for: e-filing, tax payments, websites, VAT reporting, integrating subsystems and social media; (iii) Factors for adoption and acceptance: demographic and socioeconomic factors, individual characteristics, relative advantage, social influence, and performance expectancy. Perceived usefulness was a significant predictor for young professionals, perceived ease of use was the most important factor in adoption of UK website and e-Tax in Japan. Norms and perceived risk were not significant in influencing adoption; (iv) 1 causal paper on Impact of Electronic Sales Register Machine (ESRM) on VAT in Ethiopia showed that average VAT increased by 17% after ESRM use and concluded that adoption of IT in tax can increase State fiscal capacity; and (v) key challenge for adoption was limited resources. Respati's study concluded that tax administrations are leading other PSOs in technology and e-govenrment adoption can strengthen revenue and reduce evasion. He recommends greater understanding of purpose, adoption and acceptance factors and impact and challenges in tax administration. And need to observe these factors and other factors, role of organisational characteristics and leadership support when adopting e-government and more adoption research utilising interviews in a tax context. The gap from the scoping review was under-exploration of promotional channels, incentives effects and impact studies.

2.3.2 Critical Success Factors for Adoption of Innovation

Kamal's (2006) study aimed to explore factors influencing adoption of integration technology like Enterprise Application Integration (EAI) and Customer Relationship Management systems (CRMs) in PSOs. Its key objectives were to elaborate issues on decision made by PSOs to adopt IT innovations and impact of these innovations on individual adopters. Being a multiple cases study and interpretive research approach, data was collected using interviews, review of documentation and observation. The study used a taxonomy of 8-Stage Adoption process to study 11 IT adoption models: DOI (Rogers, 1983), Theory of Reasoned Action - TRA (Ajzen & Fisbein, 1975), TAM (Davis, 1989), Theory of Planned Behaviour - TPB (Ajzen, 1985), IT Innovation Adoption research model (Agarwal & Prasad, 1998), among others. Study findings showed that factors affecting IT adoption in PSOs are: relative advantage (cost, benefits, barriers and risks), compatibility (technology, organisational characteristics, existing operations, value systems and needs), functionality, usability and degree of time and recommended that these factors should be used in conceptual models for adoption research.

Kuznetsova (2010) conducted a explanatory and comparative study to investigate factors affecting adoption of e-return filing system in Finland. Its objectives were to establish the factors and recommend ways to increase public value on return filing. The main sources of data were 2009 Finnish e-return satisfaction survey, reports and interview with an official. Data mining, mathematical modelling and

statistical analysis was conducted using SAS version 9.1. The study sampled 21,245 observations and 65 variables with respondents from all regions and income groups in Finland. Taxpayers were segmented into four groups and the Finnish e-return was benchmarked against Denmark, Estonia and Netherlands. Using a combination of Rogers' DOI Theory, Bass Adoption Model and Service Process Analysis to guide operationalization, findings showed that factors for e-return adoption included: perceived e-filing system attributes, communication channels, service quality and agency's promotional efforts. It concluded that tax e-return has a good service level and recommended: (i) improved attractiveness of e-return (e.g. instant tax assessment, unique features, targeted services) and (ii) to disincentivise manual filing (e.g. charge paper processing fee).

Mbeche et al (2017) study aimed to determine the CSFs for e-government adoption and use in the manufacturing sector. The study which targeted a population of 2,120 SMEs in Nairobi, adopted an exploratory approach using descriptive survey design in a structured questionnaire. Analysis was conducted using SPSS version 17.0 and sample size of 124 was determined using proportional stratified sampling. Various models were used including aspects of TAM. The study concluded that: (i) adoption rate is low hence need to increase uptake among SMEs; and (ii) the most CSFs affecting adoption of e-government are: usefulness, ease of use, quality of website, incentives, organisational competitiveness, faster and affordable connectivity, network security and data protection and e-government awareness and training. Recommendations highlighted included increased effort to encourage non-users to adopt the system and provision of e-government services that are valuable to users in conducting their businesses.

Birru (2022) study aimed to assess adoption and usage of electronic tax system by large taxpayers in Addis Ababa. It targeted 1,143 taxpayers with a sample size of 384 respondents determined using convenience sampling and applying Cochran's simplified formula. Self-administered questionnaires were used for primary data collection and data was analysed using STATA version 14 applying both descriptive and inferential analysis. UTAUT Model was used together with web quality, awareness, anxiety and perceived risk as factors under investigation. Findings showed that Performance Expectancy (PE), effort expectancy (EF), Social influence (SI), Awareness (AW), Web Quality (WQ) and perceived risk (PR) significantly affect a taxpayer's intention to use the e-tax system. Anxiety and perceived risk having a negative relationship with intention to use (ITU). It recommended that Ethiopia Revenue Authority (ERA) should: (i) take measures to reduce perceived risk e.g. ensure data protection and use secure anti-malware, (ii) improve ease of use in terms of obtaining services and developing taxpayers tax abilities, and (iii) ensure compatibility with other devices.

2.3.3 Influence of adoption on Staff performance

Muhia and Afande (2015) looked at adoption of e-Procurement strategy and procurement performance at KRA focusing on employees and suppliers with an objective of determining role of e-procurement in enhancing procurement performance. It randomly sampled 45 KRA procurement staff from a population of 90 and purposively selected 20 suppliers and employed a descriptive survey research design with both quantitative and qualitative analysis techniques like multivariate regressions using SPSS version 21. A blend of TAM, Unified Theory of Acceptance and use of Technology (UTAUT), Actor-Network Theory (ANT) and transactional theory was used to guide the conceptual framework. Findings showed that e-communication, electronic order processing, cost saving and level of customer service positively and significantly influenced procurement performance at KRA. Self-invoicing on behalf of clients also adds to the bottom line while reducing errors. The study concluded that e-communication promotes instant and real time responses, need for effective dialogue with suppliers and that great benefits can be derived from e-processing. It recommended that organisations should invest in e-procurement solutions, personnel and knowledge, noting that proper use of IT coupled with training can significantly reduce costs.

Mazikana (2019) conducted a study on effects of automating customs procedures on performance, service delivery and reducing corruption as well as challenges for adoption at Zimbabwe Revenue Authority (ZIMRA). It took on a positivism research philosophy with a cross-sectional survey design which used questionnaires and interviews to collect primary data from a sample of 160 ZIMRA employees, both managerial and non-managerial cadre. Systematic random sampling was used for quantitative aspect while purposive sampling was used for qualitative aspect. Secondary data entailed revenue reports, journals and publications. While borrowing from the Revised Kyoto Convention (RKC), the study used a combination of TAM and DOI theories. It revealed a strong correlation between automation and increase revenue performance and that automation has significantly reduced challenges faced by ZIMRA. It also showed a positive correlation between automation and clearing costs and has significantly reduced levels of corruption. However, it showed a weak positive correlation with taxpayer base. The study recommended that ZIMRA should enhance staff training, adopt full automation to realise benefits, consider replacing ASYCUDA with SIMBA system and pursue benchmarking for data quality aspects. This study looked at the effect of automation on reducing corruption, but does not look at corruption as a possible factor that could affect adoption. The study also focuses on organisational performance as opposed to individual job performance. It recommended a probabilistic technique with a large sample size as an area for further study.

2.3.4 Influence of adoption on Tax Revenue Collection

Weru et. al (2013) looked at change effects of implementation of Electronic Tax Registers (ETRs) anchored on the Finance bill 2004 amending the VAT Act. to establish if its adoption enhanced tax

collection at KRA, improved compliance and sealed tax evasion loopholes. They also attempted to establish the acceptance level of ETRs among KRA staff. The study which employed descriptive analysis and categorisation of questionnaires and interview content, targeted 500 traders supplying VAT products using ETR machines along Luthuli Avenue in Nairobi and 98 managers at KRA. Simple random sampling of 10% for both populations was used - sample size of 50 traders and 10 managers. Secondary data entailed project documentation, manual and monitoring and evaluation reports. It used a combination of Bridges (1991) Transition Model and 3-stage model of change by Kurt Lewis. Findings showed that the ETR system has enhanced revenue collection, reduced tax evasion and increased compliance and showed high acceptance levels among KRA staff. It recommended sensitisations, resourcing the KRA enforcement unit, revising the VAT turnover threshold downwards, integrating ETRs with KRA systems, conducting mock purchases and more sophisticated system to curb evasion. The gap in this research was that it was conducted on a small sample size of KRA staff.

Owino et al (2017) attempting to solve the problem of under-reporting of revenue collected, used a comparative study to investigate the influence of ICT on revenue collection in Homabay and Migori counties. The objectives were to establish the influence of four systems i.e. Single Business Permit system, land rates system, property rates system and bus park fee system on revenue collection. The study which used a correlation study design with a comparative analysis approach, targeted 864 revenue officials and sampled 86 respondents using stratified random sampling for clerks and purposive sampling for revenue officers. Primary data was collected using questionnaires and analysed using both descriptive analysis and inferential analysis. To guide operationalization of variables, the study used theories such as: Expediency theory of taxation, optimal theory of taxation, Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and Revenue Diversification Theory. Findings showed that a strong and almost perfect association exists between adoption of ICT solutions and revenue collection; that implementation of the four solutions has a positive and statistically significant influence on revenue and conversely non-utilisation of ICT has a negative effect. The study recommended adoption of ICT solutions by other county governments to improve revenue collection. The study covers county revenue collection, a similar study approach can be used to evaluate influence of ICT adoption on national revenue collection.

Wawira et al (2017) in their case study targeted 130 taxpayers in Rift Valley region through a census with an aim of establishing effects of electronic tax payments on revenue collection, effects of staff competency on revenue collection efficiency and determining level of taxpayer knowledge on operating the tax system. Self-administered questionnaires were used to collect primary data that was analysed using descriptive statistics and linear regressions. The study which employed the Technology Acceptance Model (TAM) and effects of corruption concluded that staff competence and electronic tax payments were both significant predictors of revenue collection efficiency. Descriptive analysis

showed that though iTax was easily accessible and staff were supportive, taxpayers thought staff were not well equipped to answer iTax-related queries. The study recommended that KRA should introduce service counters, extend service hours, incentivize e-filing, pre-populate returns, increase iTax promotional efforts, set up booths in *Huduma Centre*, tackle internet connectivity lapses and collaborate with internet café owners to promote iTax. The gap in this study was that it was majorly descriptive and focused on taxpayers rather than KRA staff. This study attempts to address this gap and also contribute to further adoption research on iTax system which has extensively been enhanced since Wawira et al's (2017) study was conducted.

Gitaru's (2017) descriptive design case study on impact of Simba Customs System on revenue collection that involved analysis of secondary revenue collection data spanning 10 years from implementation. Its objectives aimed to determine the influence of number of transactions, inflation rate and exchange rate on revenue collection after the Simba system upgrade. Regression analysis was carried out using GRETL Software. Gitaru's study looked at the social presence theory, Technological determinism theory, Theory of Social determinism, Econometric model and other theories that touch on revenue collection. It concluded that customs automation has contributed to increased revenue collection, revenue collected is inversely related to exchange rates, revenue collected is strongly related to number of transactions and inflation rate has been relatively high over the study period. One major limitation of the study is that it did not take into account other factors that may be attributed to revenue increase. It recommended that policy makers should make policies that stabilize exchange rates, ICT department should have project and change management strategies for automation success and ensure data system compatibility.

Tjen et al (2019) in their study to explore perception of online tax filing in Indonesia aimed to establish how taxpayers' perception of system quality is influenced by trust in the government, trust in the technology and trust in the e-filing website and how perceived usefulness affects both satisfaction and perceived net benefits. Primary data from the 1,095 respondents sampled, was collected using an online questionnaire and analysed using the Covariance-based Structure Equation Model (CB-SEM) for factor analysis and hypothesis testing. Theories employed included perceived usefulness, user satisfaction, trust and quality models. Study findings indicated that trust in government and the technology positively affected trust in the e-filing website. Additionally, information quality, system quality and service quality consistently and significantly influence the users' perceived usefulness and satisfaction. It concluded that taxpayers placed importance on system robustness and privacy features. Also taxpayers perceived the e-filing system as cost and time saving for facilitating compliance. This paper brought to light the element of privacy concerns as a factor affecting adoption.

Conversely, Ofurum et al (2018) research on ‘Impact of E-Taxation on Nigeria’s Revenue collection and economic growth, had a contrary finding. Their study used a pre-post analysis technique called ‘paired sample t-test’ aimed at examining how implementation of e-tax in 2015 has affected tax revenue and tax-to-GDP ratio. It analysed secondary pre-e-tax and post-e-tax implementation data from Federal Inland Revenue Services and Central Bank of Nigeria quarterly reports from 2013 to 2016. It employed the theory of Adoption of Innovation and Theory of Innovation Translation as proposed in Actor-Network Theory (ANT). The study concluded that implementation of e-Tax has not improved tax revenue, federal revenue or tax-to-GDP ratio in Nigeria. In fact, tax revenue decreased after implementation of e-Tax system. The researchers were however, optimistic that these findings will change in the long run with increased knowledge seminars, effective communication to taxpayers on obligations to complete their e-registration and e-returns and enhancement for compatibility with mobile devices for better accessibility. This paper showed that there is a chance that revenue collection can be negatively affected by IT adoption.

Through its transformation agenda, KRA has automated and enhanced its core revenue collection systems, namely: ‘iTax’, upgraded ‘Simba’ system and the new ‘iCMS’. Other systems which are not transactional also indirectly support revenue collection. Revenue collection by KRA has significantly increased throughout the years since transition from manual collection to automation. However, this increase cannot be wholly attributed to automation as many other factors come into play. KRA’s revenue collection journey as depicted in table 2.1 which shows revenue performance from fiscal year 2014/15 to 2021/22. KRA collected revenue amounts of Kshs. 1.58 Tn (approx. USD 13.6 Bn), Kshs. 1.6 Tn (approx. USD 13.7 Bn), Kshs. 1.662 Tn (approx. USD 14.3 Bn) and 2.031 Tn (approx. USD 17.13 Bn) within the last 4 fiscal years period (i.e., 2018/19, 2019/20, 2020/21 and 2021/22 respectively). A total of 3,470,586 returns were filed in the year of income 2019 relative to 2,696,561 returns filed in the year of income 2018 signaling a positive growth of 28.7% (KRA, 2020).

Table 2.1: KRA Annual Revenue performance against targets for FY 2014/15 to 2021/22

Fiscal Year	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Target (Kshs. Bn)	1,105.9	1,212.6	1,431.8	1,541.2	1,643.2	1,641.0	1,615.1	1,901.4*
Annual Performance (Kshs. Bn)	1,069.6	1,200.2	1,365.3	1,435.3	1,580.1	1,606.9	1,662.4	2,031.1*
Variance (Kshs. Bn)	(36.3)	(12.4)	(66.5)	(105.9)	(63.1)	(34.2)	47.3	129.7

*Targets are based on revised Exchequer targets

Source: KRA, 2022

Total revenue performance for the three fiscal years 2018/19, 2019/20 and 2020/21 was at Kshs. 4,849.3 Bn against a target of Kshs. 4,899.3 Bn which constituted a shortfall of Kshs. 50 Bn and represented a tax to GDP ratio of 15.8% (KRA, 2021).

2.4 Summary of Literature Review and Research Gap

Respati (2020) looks at reduction of corruption as a reason for implementing innovations, but does not consider it as a factor that influences adoption and recommends further research on incentives. Kamal's (2006) study recommended a number of factors for inclusion in conceptual frameworks. Kuznetsova (2010) supported Rogers (1962) DOI model with variations of factors like innovation characteristics and communication channels and has identified need to explore the role of change agents. Mbeche et al's (2017) has provided CSFs for adoption of e-government solutions applicable to this study. Most studies were conducted to establish factors for adoption by external users rather than KRA staff. Birru (2022) and Tjen et al. (2019) brings to light data privacy concerns as perceived risks which should be observed. Muhia and Afande (2015) looked at aspects of organisational performance rather than staff performance. Mazikana's (2019) study looks at effect of automation on reducing corruption, but does not look at corruption as a possible factor for adoption and recommends using a probabilistic technique with a larger staff sample size.

Given the theoretical review, the research gaps identified included: De Vries et. al (2015), in their extensive review show four research areas of interest for this study: (i) that there is a need to further explore the organisational and environmental contexts where innovation takes place, the nature, enabling antecedents and underlying contingencies; (ii) that most empirical studies on public sector innovation failed to address the outcomes of innovations and whether they really make a difference. (iii) that factors were addressed independently without considering possible connections between them; and (iv) that there were almost no cross-national studies, adding that comparative studies that cut across countries or sectors could show to what extent factor are generalisable.

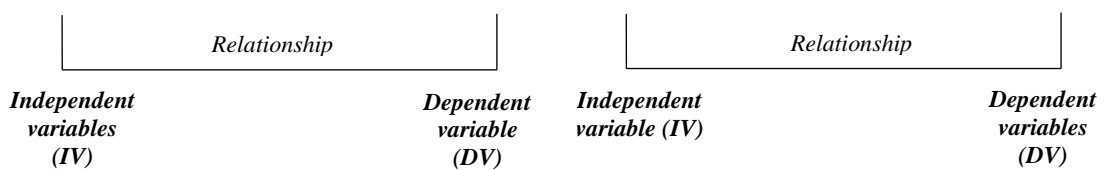
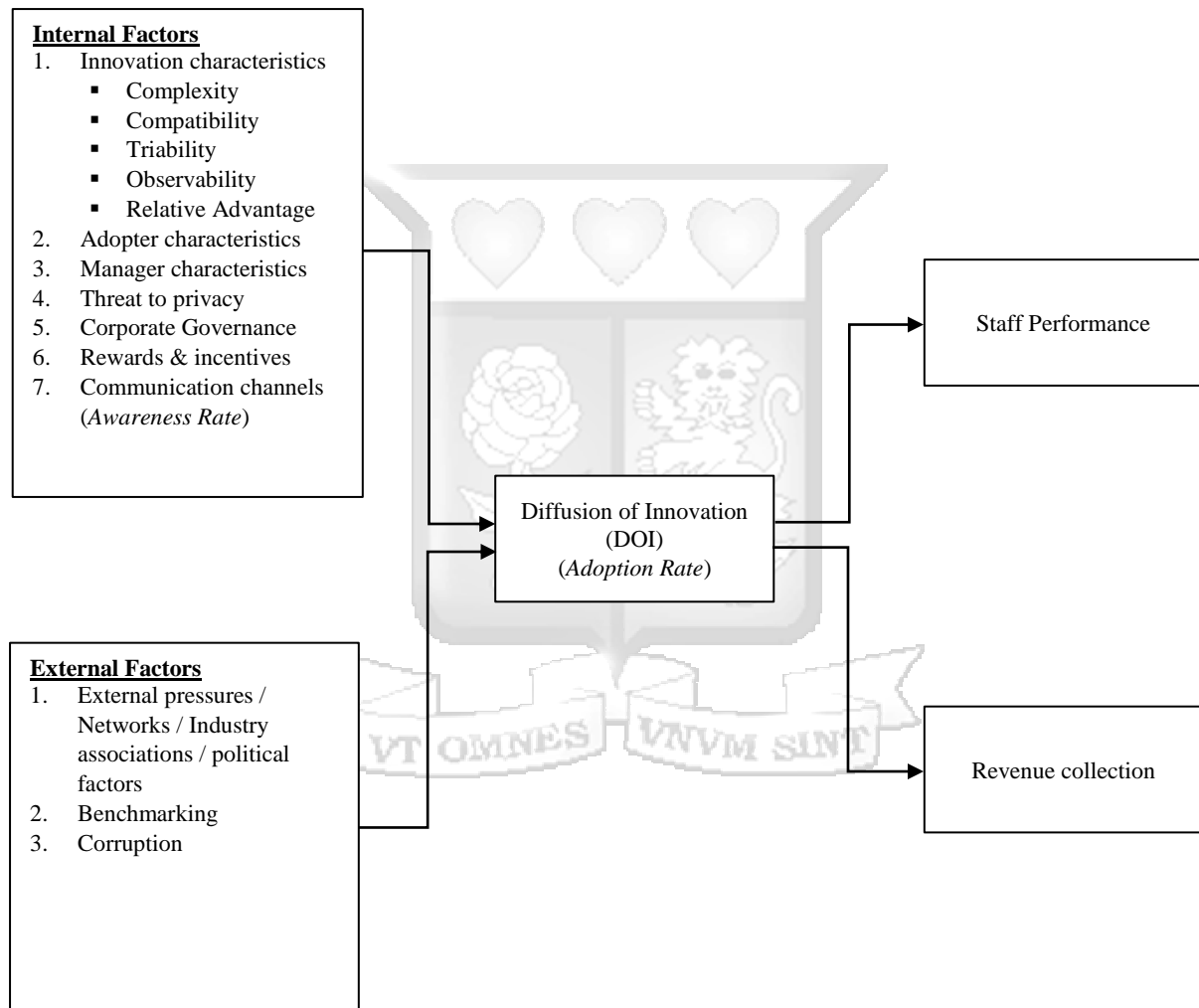
Given the empirical review, the research gaps identified included: the need to establish awareness rates and adoption rates in a tax administration context; greater understanding of purpose and acceptance in adoption research; to further explore and test other factors affecting adoption and identify the critical ones for successful adoption; to further explore the role of change agents in the adoption process; most studies were outward-facing meaning they focused on external users rather than KRA staff; further explore privacy threat and its role in non-adoption is also an aspect that this study attempted to address; look at corruption as a possible factor that could affect adoption; need to look at adoption's influence on performance from a staff perspective; and need to use a probabilistic technique with a larger staff sample size representative of KRA's current population. This study tries to explore the possibility that technology adoption can negatively influence revenue collection. It is also important to note that the systems under investigation are either new and recently enhanced since the studies were carried out hence the need to re-evaluate aspects of adoption. This study tried to answer the research gaps.

2.5 Conceptual Framework

Building on the literature review above, this study proposed the conceptual framework as shown in figure 2.1 below.

Figure 2.1: Conceptual Framework

Critical Success Factors (CSFs)



2.5.2 Operationalisation of Conceptual Framework

The study ensured operationalisation of study variables prior to conducting the research. “Operationalisation is the process of translating a concept into a form that can be measured for the purpose of data collection... A variable is a characteristic of a unit of analysis that is not constant but instead varies across individual observed cases (Eller et al, 2018).” The study considered the independent variables and the dependent variables.

The *Independent Variable (IV)* is considered a stimulus or antecedent that can affect the dependent variable whereas the *Dependent Variable (DV)* which is defined by Eller et al (2018) as the outcome the researcher is interested in explaining and predicting. The conceptual framework took the following dimensions: (i) To answer objective 1, awareness rate is an aspect of the communication channels which is on of the internal factor for adoption whereas the adoption rate is the measure for DOI; (ii) To answer objective 2, the independent variables were the Critical Success Factors (CSFs) divided into internal factors and external factors and the dependent variable was Diffusion of Innovation (Adoption Rate); and (iii) To answer objective 3 and 4 on influence of adoption on staff performance and revenue collection, the independent variable was Diffusion of Innovation (Adoption Rate) and the dependent variables were staff performance and revenue collection. The study was quantitative and used an online survey to assess staff perception of how the independent variables will affect the dependent variables.

Each of the elements in the conceptual framework were defined, measurement levels determined and means of measurement determined and aligned to questions in the questionnaire. The measurement tool adopted a blend of nominal (descriptive) scales, ordinal (ranking) scales, interval (rating) scales and ratio scales which are a reflection of the measurement levels adopted for the study. These scales were revised and minor adjustments made based on feedback from the pilot survey. Table 2.2 shows operationalisation of the conceptual framework.

Table 2.2: Operationalisation of the Conceptual Framework

Research Questions	Variable and variable definition	Indicator	How it is measured on the measurement tool	Expectation / Hypothesis
<i>Research Question 1:</i> What is the awareness rate and adoption rate of technological	<i>Adoption of Innovation (DOI):</i> voluntary and/or coercive process through which a staff passes from knowledge of an innovation, to forming an attitude towards the	Awareness Rate And; Adoption rate	(1) Likert scale; (2) Multiple choice; Measured at interval level	Awareness rate at KRA is high; Adoption rate at KRA is low.

Research Questions	Variable and variable definition	Indicator	How it is measured on the measurement tool	Expectation / Hypothesis
innovations at KRA?	innovation, to a decision to adopt or reject the innovation, and confirmation of this decision (Rogers, 2003).			
<i>Research Question 2: What are the Critical Success Factors for adoption of technological innovations at KRA?</i>	<i>Innovation characteristics:</i> (1) <i>Complexity</i> : degree to which an innovation is perceived as relatively difficult to understand and/or use. (Rogers, 1995)	Perceived complexity	Ranking scale; Measured at ordinal level	Perceived complexity is negatively related to adoption of technological innovations at KRA.
	(2) <i>Compatibility</i> : degree to which an innovation is perceived as consistent with the existing values, past ideas /experiences and needs of potential adopters (Rogers, 1995).	Perceived compatibility with job needs	Likert scale; Measured at interval level	Perceived compatibility is positively related to adoption of technological innovations at KRA
	(3) <i>Observability</i> : degree to which the results of an innovation are visible to others (Rogers, 1995).	Perceived observability; and Net Promoter Score (NPS) = Percentage promoters less Percentage detractors	A scale of 0 to 10: where 0-6 (Detractors), 7-8 (Passives) and 9-10 (Promoters); Measured at ratio level	Perceived observability is positively related to adoption of technological innovations at KRA
	(4) <i>Triability</i> : degree to which an innovation may be experimented with on a limited basis (Rogers, 1995).	Perceived triability	Likert scale; Measured at interval level	Perceived triability is positively related to adoption of technological innovations at KRA
	(5) <i>Relative Advantage</i> : degree to which an innovation is perceived as better than the idea it supersedes (Rogers, 1995).	Perceived relative advantage and benefits i.e., Improved productivity or work performance	Likert scale; Measured at interval level	Perceived relative advantage is positively related to adoption of technological innovations at KRA.
	<i>Adopter Characteristics</i> : attributes of individuals within the tax administration further classified as: innovators, early adopters,	Perceived adopter characteristics;	(1) Likert scale; and (2) Multiple choice;	High innovator characteristics is positively related to adoption rate of

Research Questions	Variable and variable definition	Indicator	How it is measured on the measurement tool	Expectation / Hypothesis
	early majority, late majority and Laggards (Rogers, 2003).		Measured at interval level	technological innovations at KRA.
	Managers' characteristics: attributes of the senior management or leadership within the institution and their role in promoting or inhibiting innovation adoption. (Damanpour, 1991; Kearney et al, 2000; Damanpour & Schneider, 2008; De Vries, 2015)	Highest rated Manager characteristics	Multiple-choice where multiple responses can be ticked; Measured at ordinal level	Highest rated characteristic of managers that influence adoption.
	<i>Threat to privacy</i> : attitudes, beliefs or reservations individuals within the tax administration have towards sharing or inputting their personal data on technological systems or belief that their data is not safe and can easily be accessed by unauthorised third parties. (Troshani & Doolin, 2005; Potts and Kastle, 2010)	Perceived threat to privacy	Multiple-choice where multiple responses can be ticked; Measured at ordinal level	High perceived threat to privacy is negatively related to adoption rate of technological innovations at KRA.
	<i>Corporate Governance</i> : reporting lines & set of relationships between the tax Authority and its stakeholders (OECD, 2015).	Frequency of technological innovation performance audits and review of corporate innovation policies	(1) Likert scale; and (2) Multiple choice questions Measured at interval level	Good corporate governance on innovation policies is positively related to adoption of technological innovations.
	<i>Rewards & Incentives</i> : positive or negative incentives given for usage or non-usage of a new system. (Fine, 1986; Rogers, 1995; Potts & Kastle, 2010)	Perceived incentives (Both positive and negative)	(1) Likert scale measured at interval level (2) Open-ended questions measured at nominal level	Perceived incentive is positively related to adoption of technological innovations at KRA.
	<i>Communication channel</i> : means and mode through which individuals can communicate and	Channel highest rated as effective	Multiple-choice questions where multiple	Effective communication channels are

Research Questions	Variable and variable definition	Indicator	How it is measured on the measurement tool	Expectation / Hypothesis
	stay connected verbally, visually, interpersonally, in writing or electronically. (Rogers, 1962; 1995; 2003; Tidd, 2006; Ishmail, 2006)	for communicating new technologies	responses can be ticked; Measured at ordinal level	positively related to adoption rate of technological innovations at KRA.
	<i>External pressures / Industry Associations / Networks / Political factors:</i> pressures from government, media (social media, print media and mass media), and other publics that are not within the control of the tax Authority (Troshani & Doolin, 2005; Potts & Kastle, 2010)	Perceived external pressures	Likert scale measured at interval level	Perceived external pressure is positively related to rate of adoption of technological innovations at KRA.
	<i>Benchmarking:</i> efforts or visits (either physically or electronically) for peer learning in the area of innovation. (Stolk & Wegrich, 2008; Potts & Kastle, 2010; Azadegan & Teich, 2010)	Perceived influence of Benchmarking on adoption	Likert scale measured at interval level	Perceived benchmarking activities is positively related to adoption rate of technological innovations at KRA.
	<i>Corruption:</i> This study adopted the term 'corruption' as defined by Anti-Corruption and Economics Crimes Act, (2003) laws of Kenya. (Jenkins, 1996; Bird & Zolt, 2008, ACEC Act, 2011)	Perceived influence of corruption on innovation adoption	Likert scale measured at interval level	Perceived corruption level is negatively related to adoption rate of technological innovations at KRA.
<i>Research Question 3:</i> To what extent does adoption of technological innovation influence staff performance at KRA?	<i>Staff work performance:</i> level of improved work performance or of revenue collected within a specific time period over total employees. (Rajagopal, 2001; Singh & Mohanty, 2012; Bessant, 2014)	Improved Staff performance	(1) Likert scale; and (2) Ranking scale; Measured at interval level	High adoption rate of technological innovations is positively related to Staff performance
<i>Research Question 4:</i> To what extent does adoption of technological	<i>Revenue Collection:</i> total tax collected in the national currency (KES) within a Fiscal Year (FY) i.e. 1 st July to 30 th June.	Increased Revenue collection And	(1) Likert scale measured at interval level;	High adoption rate of technological innovations is positively related to

Research Questions	Variable and variable definition	Indicator	How it is measured on the measurement tool	Expectation / Hypothesis
innovations influence revenue collection at KRA?		New innovative revenue collection systems	(2) Open-ended questions; and (3) Dichotomous scales e.g. Yes/No measured at ordinal level	revenue collection at KRA



CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives details and guidelines on how the study was conducted with reference to the research philosophy, research design, population and sampling methods, data collection methods, analysis techniques, testing of data quality and ethical considerations.

3.2 Research Philosophy

This study was inclined towards a pragmatic research philosophy using quantitative techniques. It aimed to obtain practical solutions and consequences to the problem at hand through an explanatory research design aimed at answering the research questions and testing the hypotheses. Creswell (2014) states that a research philosophy is the underlying belief held by a researcher on the way data for a study should be collected, analysed and applied.

3.3 Research design

Research design refers to the process by which data gathering efforts are structured and defined (Eller et al, 2018). This research was an explanatory research with a descriptive arrangement trying to investigate associations between variables whose ex-post facto data was collected through a communication design where a questionnaire was used to try and address four research questions. Eller et al (2018) state that explanatory research involves investigation of how changes in one part of the world are related to changes in other parts of the world. To help minimize biases, the researcher had no control over the variables and as such only made observations and reported findings. The study was cross-sectional in nature and was conducted within a period of four (4) months from December 2021 to March 2022 to pull data from a representative sample that allows for generalisations. The structured anonymised online questionnaire was sent to KRA staff stationed across the country.

3.4 Population and Sampling Technique

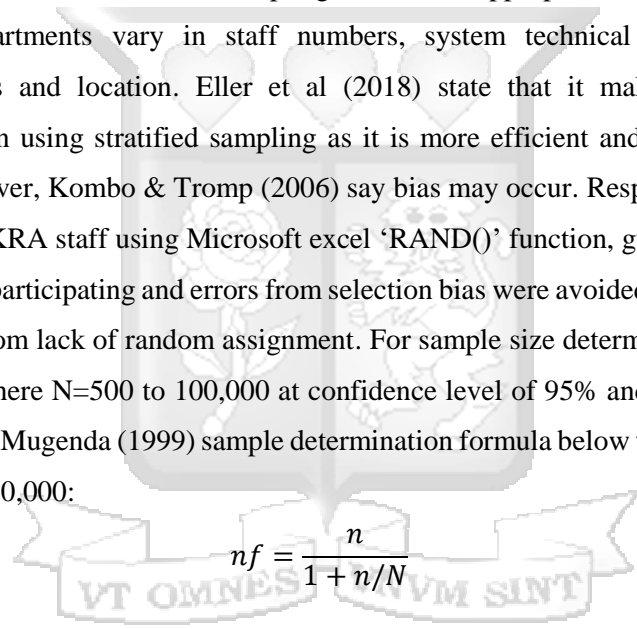
3.4.1 Population of Study

KRA was the unit of analysis and the population sample frame was a list of all KRA staff composed of diverse individuals in different age brackets, level of education, cadres and years of experience. KRA

staff are the targeted users of these technological innovations hence were appropriate subjects. As shown in table 3.1, the target population was all 7,955 KRA staffs distributed across all 13 KRA departments country wide as at July 2021 (KRA, 2021). The actual KRA stations included among others: Airports, Border stations, Container Freight Stations (CFSs), Times Tower, Corporate Business Centre (CBC) in Upperhill Nairobi, Export Processing Zones (EPZs), Bonded Warehouses, Ushuru Pension Plaza, KESRA Centres, Mombasa Longroom, Sameer Business Park, Tax Service Offices (TSOs) and all satellite offices. All KRA stations have internet and intranet connectivity which meant an online survey reached a representative sample of the KRA population.

3.4.2 Sampling Technique

The study used disproportionate stratified sampling which was appropriate because the population is heterogeneous as departments vary in staff numbers, system technical knowhow, specialised knowledge, capabilities and location. Eller et al (2018) state that it makes sense to engage a heterogeneous population using stratified sampling as it is more efficient and allows for comparison between stratum. However, Kombo & Tromp (2006) say bias may occur. Respondents were randomly assigned from a list of KRA staff using Microsoft excel 'RAND()' function, guaranteeing that all staff had an equal chance of participating and errors from selection bias were avoided. Eller et al (2018) posit selection bias arising from lack of random assignment. For sample size determination, the Krejcie and Morgan (1970) table where N=500 to 100,000 at confidence level of 95% and margin of error of 5% was used. Mugenda and Mugenda (1999) sample determination formula below was used since the target population is less than 10,000:



$$nf = \frac{n}{1 + n/N}$$

Where: nf is the desired sample size when the population is less than 10,000; n is the desired sample size when the population is more than 10,000; and N is the estimate of the population size

Solution:

$$\text{Sample Size } (nf) = \frac{378}{1 + 378/7,955} = 361.0315$$

The sample size arrived at was 361 rounded up to make 370 respondents. Table 3.1 shows percentage proportions per department computed as: Total number of staff in a department/ Total number of KRA staff * 100.

Table 3.1: Stratified population Sampling

	Department	No. of Staff in Department	Percentage of Sample	Desired Sample size
1.	CG's Executive Office & Operations	37	1%	4
2.	Domestic Taxes	2,862	35%	130
3.	Customs & Border Control	2,136	26%	96
4.	Corporate Support Services	1,261	16%	59
5.	Strategy, Innovation & Risk Management	249	3%	11
6.	Internal Audit	46	1%	4
7.	Intelligence & Strategic Operations	212	2%	7
8.	Investigation & Enforcement	204	3%	11
9.	Legal Services & Board Coordination	159	2%	7
10.	Kenya School of Revenue Administration	129	2%	7
11.	Marketing & Communications	462	6%	22
12.	Supply Chain Management	54	1%	4
13.	County Revenue	144	2%	7
	TOTAL	7,955	100%	370

To ensure a 30% minimum response rate, sample size was adjusted by 50% to cater for non-responsiveness i.e.: respondents who choose not to respond, respondents who abandon the questionnaire midway, and respondents who are unreachable or may not receive the email. In light of these, 540 questionnaires were sent to respondents via email. Israel (2013) suggests an adjustment by adding 10% to the sample size to cater for targeted respondents you are unable to contact. This ensured that the sample was adequately representative of the whole population. Only 15 technological innovations were sampled for investigation.

3.5 Data collection methods

Primary data was collected using a structured anonymous online questionnaire developed and administered using Qualtrics software. Qualtrics is simple to use and allows for customised construction of questions, features like 'display logic' which helped ensure clean data, allows importation and exportation of data in formats compatible with other analysis software. However, it provides only descriptive analysis. Machado (2012) and Lennon (2013) discuss these merits and demerits in their papers. The questionnaire contained 30 questions divided into 3 main sections: (i) Consent form; (ii) Main questionnaire; and (iii) Demographic information. Questions were a combination of Likert scales, ranking questions, multiple choice and open-ended questions. Secondary data was collected through online resources, e-books and from KRA sources.

An anonymous survey link was sent to targeted respondents via their official KRA emails. The email identified the researcher by name, contained the survey link, stated purpose of the study, highlighted the benefits and risks of the study and urged respondents to complete the survey. Follow-up emails were sent to respondents after a one-and-a-half-month lapse reminding those who had not completed the survey to do so. To ensure that data collected was clean, Qualtrics 'display logic' function was used whereby specific question choices appeared only to respondents who indicated that they had interacted with a particular system.

3.6 Data analysis Methods

Data collected was cleaned prior to commencing analysis and analysis was divided into descriptive analysis, inferential analysis and demographic analysis. Descriptive analysis was done using Qualtrics version 2022. Descriptive statistics are statistical tools used to represent what we know about information on any given variable and to describe the information in a simple way (Eller et al, 2018). Orodho (2002) adds that descriptive statistics are useful for fact finding and formulation of important principles of knowledge. For this study, proportions (percentages), frequency distributions, measures of central tendency (e.g., mean) and measures of dispersion (standard deviation) were used. Adoption rate was computed using the Rogers (1995) simple adoption rate formula expressed as a percentage i.e. $\text{Number of active users} / \text{Total number of users} * 100$.

Inferential analysis was done using STATA version 16 whereby Correlation analysis, Pearson's correlation co-efficient and coefficient of determination (R^2) was used to test the hypothesised relationships between variables. Simple bivariate regression equations were used to predict the DV given each IV and multivariate regression was used to predict relationship between CSFs. The significance level used was p-value is less than or equal to 0.05 i.e., $p \leq 0.05$ at a 95% confidence level. Microsoft Office Excel 2019 was used for content analysis on comments from open-ended questions through categorizing. Results and findings were presented in tables and figures.

3.7 Research Quality: Reliability and Validity Tests

A pilot survey was administered to 13 staff to validate question construction and check general structure of the instrument and feedback was incorporated into the final survey to ensure clarity and produce consistent and reliable results for analysis. Only questionnaires that were 100% complete were analysed as observations and questions on the questionnaire were matched to corresponding research objectives. Internal validity was established by evaluating relationships between variables. The online nature of the tool ensured ease to administer, convenience and affordable for respondents to access.

Cronbach Alpha formula was used to assess the reliability and internal consistency of the tool with reliability ranges from 0 to 1 where 1 is complete internal consistency and 0 is no consistency. The formula used was as below: $\alpha = \frac{K}{K-1} (1 - \frac{\sum V_i}{V_t})$. Where: α is Cronbach's coefficient, K is the number of components, V_i is the sum of variances and V_t is the variance of the total score. The coefficient threshold used was $\alpha \geq 0.7$ - an acceptable range according to Abraham & Barker (2014) and Taber (2018). Taber (2018) however says this threshold of 0.7 and above offers limited evidence of reliability and sometimes very high alpha values may be undesirable. Question 11 of the questionnaire (which measured observability of the 15 systems on a ranking scale for 316 observations) was sampled and computed as follows: $\alpha = (15/15-1) * (1 - 82.909/407.83) = 0.8536 > 0.7$ showing that the questionnaire had a high internal consistency thus reliable for testing the hypotheses.

3.8 Ethical Considerations

Ethical considerations are fundamental for protecting the rights and interests of respondents. Eller et al (2018) add that research discussions are incomplete without a discussion on ethical implications of collecting data on human subjects. In this regard, ethical approvals from the Strathmore Business School University Ethics Board and National Commission for Science, Technology and Innovation (NACOSTI) were sought before data collection commenced. The necessary internal approval to conduct the research was obtained. An introduction letter was shared with respondent upon request and the identity of the researcher was indicated on the email sent out to respondents as well as in section I of the questionnaire.

The researcher explained to each respondent what the study entails, purpose of the study and benefits that will accrue as a result of the study. It was made clear that the purpose of the study was purely academic and showed to respondents intent to share the final research document upon request. Authors from other sources were acknowledged and referenced accordingly using APA referencing. The researcher conducted herself with utmost professionalism in the process of communication and respondents were reassured that anonymity and confidentiality was observed. Respondents were also given the option to agree or disagree with regards to the storage of their data from the questionnaire for future analysis. Consent was obtained from all respondents. The questionnaire and emails contained the researcher's email address in case the respondents had any questions or concerns. The questionnaire expressly stated to respondents that participation was voluntary and they were at liberty to withdraw or end participation at will.

CHAPTER 4: DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents an analysis of data collected using the measuring tool. Findings on the response rate have been presented first then analysis of demographic data captured under section III of the questionnaire. It then gives an analysis of descriptive statistics followed by analysis of inferential statistics showing how each hypothesis was tested. Lastly the chapter covers results and interpretation of findings, linking findings with literature reviewed to assist in interpretation and drew implications that would advise conclusions and recommendations for the study.

4.2 Response Rate

The response rate is the percentage of respondents who answered all the survey questions. Respondents are officials working at KRA in the calendar year 2022. The study targeted a sample of 370 respondents, but sent out 545 questionnaires to cushion for non-response. Israel (2013) suggests an adjustment of the response rate by adding 10% to the sample size to cater for unreachable respondents. 316 questionnaires were completed and considered as observations, making a 58% response rate which was an adequate for analysis. Supported by Bryman and Bell's (2015) assertion that 50% response rate is adequate, 60% is good and 70% and above is excellent for analysis and drawing conclusions.

4.3 Demographic Analysis

As presented in table 4.1, the age distribution of respondents is highest for 31-35 years and relatively equal for 36-40 and 41 years and more. A large number of respondents have served in KRA for 1 – 5 years. Majority of respondents have reached undergraduate degree level of education and are supervisors. Domestic Taxes department had the largest number of respondents closely followed by Customs and Border Control department while Supply Chain Management had the lowest number of respondents. Majority of respondents were stationed in Times Tower making up 42.41% of respondents. Stations specified as 'others' included: Petroleum Monitoring Unit (PMU), Inland Container Depot (ICD) Nairobi, *Huduma* Centres, Customs sheds, Rapid Response Unit (RRU) in Machakos, Bungoma and Moi International Airport Mombasa. 57.28% of respondents are male, 40.19% are female while 2.53% preferred not to state gender. Out of 324 respondents who completed the survey, 316 consented to participate whereas the remaining 8 who clicked "I do not consent", the survey ended at that point. Table 4.2 shows that there were 52 perceived male innovators and 31 perceived female innovators; 2

perceived innovators preferred not to state gender. Domestic Taxes department had the highest number of perceived innovators with 23 innovators.

Table 4.1: Respondents' Demographic Statistics

Age Bracket	Freq.	%	Education	Freq.	%
18 – 25 years	10	3.16%	Primary / Elementary	0	0.00%
26 – 30 years	62	19.62%	Secondary / High school	3	0.95%
31 – 35 years	91	28.80%	Certificate / Diploma	22	6.96%
36 – 40 years	77	24.37%	Undergraduate degree	161	50.95%
41 years or more	76	24.05%	Postgraduate degree	124	39.24%
Total	316	100%	Doctorate	4	1.27%
			Other (Please specify)	2	0.63%
			Total	316	100%
Duration of Service at KRA	Freq.	%	Level of Management	Freq.	%
0 – 11 Months	12	3.80%	Board Level	0	0.00%
1 – 5 Years	119	37.66%	Senior mgt. Level	13	4.11%
6 – 10 Years	67	21.20%	Middle mgt. level	63	19.94%
11 – 15 Years	76	24.05%	Supervisory/ Lower level	127	40.19%
16 – 19 Years	24	7.59%	Junior level staff	101	31.96%
20 Years and above	18	5.70%	Other (Please specify)	12	3.80%
Total	316	100%	Total	316	100%
Department	Freq.	%	KRA Station / Location	Freq.	%
Commissioner General's	4	1.27%	Airports / Ports (Kilindini or Lamu)	12	3.80%
County Revenue Division	5	1.58%	Border Stations / One-Stop-Border	9	2.85%
Customs & Border Control	63	19.94%	Container Freight Stations	5	1.58%
Intelligence Department	35	11.08%	Corporate Business Centre (CBC)	26	8.23%
Internal Audit Dept.	4	1.27%	EPZs / Customs Warehouses	1	0.32%
Investigations Department	7	2.22%	Fortis, Ushuru Pension Plaza (UPP)	31	9.81%
KESRA	7	2.22%	KESRA Centres	6	1.90%
Corporate Services Dept.	38	12.03%	Mombasa Longroom	14	4.43%
Strategy Department	26	8.23%	Sameer Business Park	13	4.11%
Legal Services Dept.	6	1.90%	Tax Service Offices / Centres	17	5.38%
Marketing Department	27	8.54%	Times Tower	134	42.41%
Supply chain Mgt.	2	0.63%	Others (Please specify)	48	15.19%
Domestic Taxes Dept.	92	29.11%	Total	316	100.00%
Total	316	100%			
Gender	Freq.	%	Consent Form	Freq.	%
Male	181	57.28%	I Consent	316	97.53%
Female	127	40.19%	I do no consent	8	2.47%
Prefer not to say	8	2.53%	Total	324	100%
Total	316	100%			

Table 4.2: Demographics linked to Innovators (Adopter characteristics)

Department	No. of Innovators	Age Bracket	No. of Innovators
Commissioner General's	-	18 – 25 years	7
County Revenue Division	2	26 – 30 years	17
Customs and Border Control	17	31 – 35 years	20
Intelligence Department	9	36 – 40 years	20
Internal Audit Dept.	1	41 years or more	21
Investigations Department	0	Total	85
KESRA	3		
Corporate Services Dept.	13		
Strategy Department	5	Gender	No. of Innovators
Legal Services Dept.	4	Male	52
Marketing Department	7	Female	31
Supply chain Mgt.	1	Prefer not to say	2
Domestic Taxes Dept.	23	Total	85
Total	85		

4.4 Descriptive Analysis

The descriptive statistics were analysed and organised in the order of the study objectives.

4.4.1 Descriptive analysis of Awareness rate and Adoption rate of KRA Systems

The first study objective aimed to establish the awareness rate and adoption rate of technological innovations at KRA. For purposes of this study, the *awareness rate* was computed as Total number of staff who are aware but not used the system plus number of staff who are aware and have used the system for a specific period / Total number of observations for a specific period multiplied by 100 whereas *adoption rate* is computed as Total number of active users for a specific period / Total number of observations for a specific period multiplied by 100.

Table 4.3 presented findings in terms of awareness rate, adoption rate, and frequency relating to information measuring the respondents' level of awareness and usage where 1 – not used and not aware, 2 – Aware but not used and 3 – Used. From the findings, staff are most aware of iTax, KRA Hub, ACHIEVE and iKnow at 100%, 99.68%, 99.68% and 99.68% respectively whereas they are least aware of Team Central and Ejuris at 80.38% and 43.04% respectively. The most used systems are KRA Hub, ACHIEVE and iTAX at 98.42%, 97.15% and 91.14% respectively while the least used is Ejuris (3.16%) closely followed by iWhistle (9.81%). Majority agreed that they are aware of but have not used iWhistle and iNNovate. Ejuris system is not popular as majority of respondents agreed that they have not used

and were unaware of the system's existence. The average awareness rate and adoption rate were 91.08% and 45.72% respectively for all the 15 systems.

Table 4.3: Staff awareness rate and Adoption rate of KRA systems

System	Not used & Not aware	Freq.	Aware but not used	Freq.	Used	Freq.	Obs.	Awareness Rate	Adoption rate
Simba System	3.80%	12	55.38%	175	40.82%	129	316	96.20%	40.82%
KRA Website	4.43%	14	7.59%	24	87.97%	278	316	95.57%	87.97%
iTax	0.00%	0	8.86%	28	91.14%	288	316	100.00%	91.14%
iKnow	0.32%	1	28.48%	90	71.20%	225	316	99.68%	71.20%
iConnect	4.43%	14	66.14%	209	29.43%	93	316	95.57%	29.43%
iCMS	3.16%	10	61.71%	195	35.13%	111	316	96.84%	35.13%
iCARE	8.86%	28	75.95%	240	15.19%	48	316	91.14%	15.19%
iNNovate	8.23%	26	79.75%	252	12.03%	38	316	91.77%	12.03%
Team Central	19.62%	62	52.53%	166	27.85%	88	316	80.38%	27.85%
EIMS	9.81%	31	51.90%	164	38.29%	121	316	90.19%	38.29%
iWhistle	3.48%	11	86.71%	274	9.81%	31	316	96.52%	9.81%
QMS – Qpulse	10.13%	32	61.71%	195	28.16%	89	316	89.87%	28.16%
KRA Hub	0.32%	1	1.27%	4	98.42%	311	316	99.68%	98.42%
ACHIEVE	0.32%	1	2.53%	8	97.15%	307	316	99.68%	97.15%
Ejuris	56.96%	180	39.87%	126	3.16%	10	316	43.04%	3.16%

Table 4.4 presented findings in terms of mean, standard deviation and frequency relating to information measuring level of acceptance on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat disagree, 4 – Neutral, 5 – Somewhat agree and 6 – Agree. Majority of respondents were in agreement that KRAHub, iTax and Simba systems respectively are the most widely used and accepted systems by KRA staff; judging by the high means and low standard deviations respectively. Majority of respondents were of the opinion that iConnect, and iKNOW are the least accepted by KRA staff. This implies that some systems are widely used and accepted while others are not.

Table 4.4: Staff acceptance levels of KRA systems

System	Mean	Std. Dev	Freq.
Simba System acceptance level	5.67	0.98	129
New KRA Website acceptance level	5.10	1.52	278
iTax acceptance level	5.87	0.52	288
iKnow acceptance level	4.64	1.54	225
iConnect acceptance level	4.29	1.56	93
iCMS acceptance level	5.49	0.89	111
iCARE acceptance level	4.67	1.36	48
iNNovate acceptance level	4.97	1.14	38
Team Central acceptance level	4.83	1.25	88
EIMS acceptance level	4.79	1.34	121

iWhistle acceptance level	4.71	1.22	31
QMS – Qpulse acceptance level	4.73	1.17	89
KRA Hub acceptance level	5.87	0.49	311
ACHIEVE acceptance level	5.01	1.42	307
Ejuris system acceptance level	4.70	1.62	10

In addition to this, the study asked staff to estimate the adoption rate i.e., rate at which staff start using new technological systems implemented at KRA. Findings in table 4.5 show, majority of respondents (47.15%) were of the opinion that innovation adoption rate at KRA was 26% and above, while 18.04% of respondents thought that the rate falls between 21% to 25%. A small proportion of 2.85% felt that the adoption rate at KRA stands between 0% to 5%. This implies that staff perceive that KRA has technological innovation adoption rate of 21% and above.

Table 4.5: Respondents’ perception of adoption Rate of systems implemented at KRA

	Mean	Std Dev.
	4.72	1.52
Approximate Adoption Rate	Percentage of respondents	Freq.
0 – 5%	2.85%	9
6% – 10%	10.13%	32
11% – 15%	11.08%	35
16% – 20%	10.76%	34
21% – 25%	18.04%	57
26% and above	47.15%	149
Total	100%	316

4.4.2 Descriptive analysis of factors for innovation Adoption at KRA

The factors under investigation were fourteen (14) factors with eleven internal and three external factors. The eleven (11) internal factors included: complexity, compatibility, observability, triability, relative advantage, adopter characteristics, manager characteristics, threat to privacy, corporate governance, incentives, and communication channels. The three (3) external factors included: External pressures, benchmarking and corruption. Descriptive statistics for the factors is anal

The first factor for adoption was complexity. The study sought to establish the extent to which system’s complexity affects adoption. Respondents were asked to rank system complexity on a scale of 1 to 15 where 1 is least complex and 15 is most complex. Table 4.6 presented the mean, standard deviation and frequency relating to information measuring respondents’ perception of a system’s complexity. Majority agreed that KRA Hub and Simba System, respectively are the simplest systems ranked by most at 1, followed by iTax and KRA Website in that order. Majority agreed that ACHIEVE, iNNovate

and Ejuris are the most complex systems to use. For comparability of systems with a higher frequency of respondents, ACHIEVE is the most complex system whereas for systems with a lower frequency of respondents, iNNovate is the most complex.

Table 4.6: Ranking by Complexity of KRA Systems

Description	Mean	Std. dev	Freq.
Complexity of KRA Simba System	3.01	2.31	129
Complexity of New KRA website	3.04	1.66	278
Complexity of iTax system	3.02	2.26	288
Complexity of iKnow system	4.17	1.73	225
Complexity of iConnect System	5.82	2.02	93
Complexity of iCMS	5.50	2.70	111
Complexity of iCARE System	6.69	2.27	48
Complexity of iNNovate System	7.00	3.52	38
Complexity of Team Central	5.51	2.13	88
Complexity of EIMS	5.33	2.24	121
Complexity of QMS- iWhistle	6.16	2.71	31
Complexity of QMS – Qpulse	6.56	2.02	89
Complexity of KRA Hub	2.59	1.95	311
Complexity of ACHIEVE System	5.58	2.49	307
Complexity of Ejuris	7.80	3.29	10

The second factor for adoption was compatibility of the system with target users' job needs. Table 4.7 presented the mean, standard deviation and frequency relating to data measuring respondents' perceived level of system's compatibility with their job needs on a scale of 1 to 6, where 1 – Not sure, 2 – Disagree, 3 – Somewhat disagree, 4 – Neutral, 5 – Somewhat Agree and 6 – Agree. Majority agreed that KRA Hub and iTax adequately addressed their job needs with a mean score and standard deviation of 5.83, 0.53 and 5.65, 0.80 respectively. The least compatible systems were ACHIEVE and iConnect respectively. Interestingly, staff were not sure whether Simba System and KRA Website addressed their job needs. These findings imply that iTax and KRA Hub are the systems perceived to be most compatible with employees' job needs while ACHIEVE is the least compatible.

Table 4.7: Compatibility of KRA systems with staffs' job needs

Descriptions	Mean	Std. Dev	Freq.
Compatibility of Simba system with job needs	5.16	1.42	129
Compatibility of KRA website with job needs	5.27	1.04	278
Compatibility of iTax with job needs	5.65	0.80	288
Compatibility of iKnow with job needs	5.17	1.14	225
Compatibility of iConnect with job needs	4.75	1.22	93
Compatibility of iCMS with job needs	5.38	1.08	111

Compatibility of iCARE with job needs	4.96	1.22	48
Compatibility of iNNovate with job needs	5.26	0.99	38
Compatibility of Team Central with job needs	5.35	0.95	88
Compatibility of EIMS with job needs	5.32	1.02	121
Compatibility of iWhistle with job needs	5.26	1.01	31
Compatibility of QMS-Qpulse with job needs	5.08	1.01	89
Compatibility of KRA Hub with job needs	5.83	0.53	311
Compatibility of ACHIEVE with job needs	4.74	1.39	307
Compatibility of Ejuris with job needs	5.10	1.22	10

The third factor for adoption was observability of the system's benefits. Based on the likelihood that respondents will recommend it to a colleague because of its observable benefits. The rating used the Net Promoter Score (NPS) scale of 0 – 10 where: 0 – 6 is highly unlikely (respondents were detractors), 7 – 8 is neutral (respondents were Passives) and 9 – 10 is highly likely (respondents were Promoters). The NPS was computed by subtracting percentage Detractors from percentage Promoters. From findings depicted in table 4.8, we observe that KRA Hub, iTax and KRA Website have the most observable benefits to staff with the highest number of promoters and a NPS of 73.95 and 69.10 and 35.97 respectively whereas iConnect, QMS and ACHIEVE have the least observable benefits with a NPS of -44.09, -30.34 and -28.34 respectively.

Table 4.8: Observability of KRA Systems using Net Promoter Score (NPS)

Description	Detractors	Passives	Promoters	Total Users	NPS
	(0 - 6)	(7 - 8)	(9 - 10)		
Observability of Simba system	33	34	62	129	22.48
Observability of New KRA website	57	64	157	278	35.97
Observability of iTax system	22	45	221	288	69.10
Observability of iKnow system	75	59	92	226	7.52
Observability of iConnect	58	18	17	93	-44.09
Observability of iCMS	22	34	55	111	29.73
Observability of iCARE system	23	11	14	48	-18.75
Observability of iNNovate system	18	4	16	38	-5.26
Observability of Team Central	41	24	23	88	-20.45
Observability of EIMS	43	38	40	121	-2.48
Observability of iWhistle system	9	7	15	31	19.35
Observability of QMS-Qpulse system	45	26	18	89	-30.34
Observability of KRA Hub	19	43	249	311	73.95
Observability of ACHIEVE system	173	48	86	307	-28.34
Observability of Ejuris system	3	0	7	10	40.00

The fourth factor for adoption was triability of the system i.e., whether the system allows respondents to use it on a trial basis only. Table 4.9 presented the findings in terms of mean, standard deviation and frequency relating to information measuring perceived level of triability on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat Disagree, 4 – Neutral, 5 – Somewhat Agree and 6 – Agree. Majority of respondents disagreed or somewhat disagreed that all 15 systems can be used on a trial basis only. This implies that staff at KRA are only able to use systems at full mode and not on a trial basis.

Table 4.9: Triability of KRA Systems

Description	Mean	Std Dev.	Freq.
Triability of Simba System	2.69	1.50	129
Triability of New KRA Website	2.85	1.59	278
Triability of iTax system	2.94	1.64	288
Triability of iKnow system	2.80	1.52	225
Triability of iConnect system	2.94	1.54	93
Triability of iCMS	2.74	1.59	111
Triability of iCARE system	2.88	1.63	48
Triability of iNNovate system	3.50	1.67	38
Triability of Team Central	2.61	1.35	88
Triability of EIMS	2.74	1.53	121
Triability of iWhistle system	2.84	1.63	31
Triability of QMS – Qpulse	2.76	1.54	89
Triability of KRA Hub	2.99	1.70	311
Triability of ACHIEVE system	3.07	1.68	307
Triability of Ejuris system	3.90	1.87	10

The fifth factor for adoption was relative advantage i.e., benefits the system has over preceding systems in terms of improved performance or efficiency. Table 4.10 presented findings in mean, standard deviation and frequency relating to information measuring perceived relative advantage on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat Disagree, 4 – Neutral, 5 – Somewhat Agree and 6 – Agree. Table 4.8 shows, majority of respondents agreed that KRA Hub, iNNovate, iTax and Simba Systems have the highest level of relative advantage compared to previous systems respectively. Whereas iConnect and KRA Website had the lowest level of relative advantage compared to previous systems respectively. Majority of staff generally perceived new systems as being much better than the solutions they were replacing.

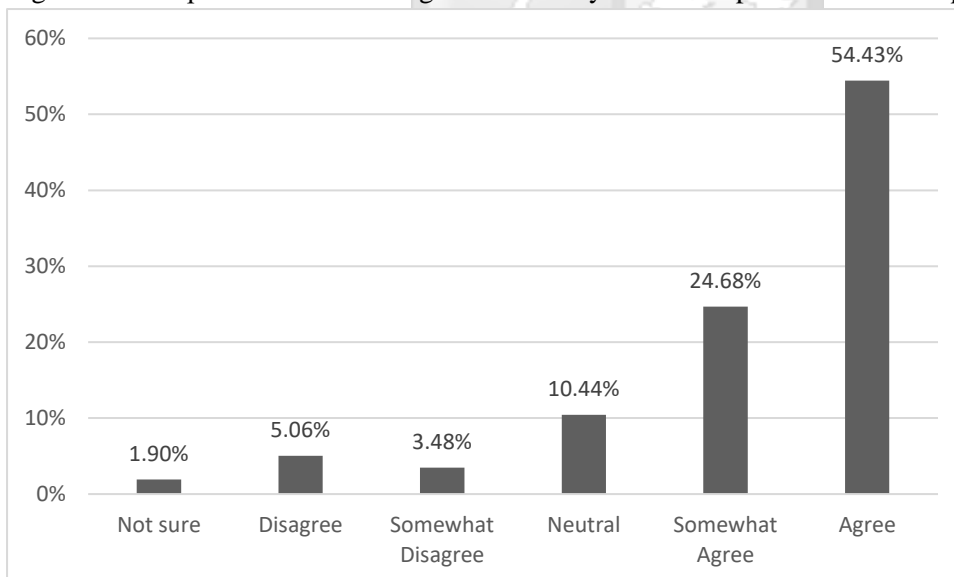
Table 4.10: Relative Advantage of KRA systems over previous systems

Description	Mean	Std Dev.	Freq.
Relative advantage of Simba System	5.48	1.08	129
Relative advantage of New KRA Website	4.56	1.54	278
Relative advantage of iTax System	5.55	1.01	288

Relative advantage of iKnow System	4.80	1.24	225
Relative advantage of iConnect System	4.24	1.53	93
Relative advantage of iCMS	5.40	1.08	111
Relative advantage of iCARE system	4.77	1.19	48
Relative advantage of iNNovate System	5.11	0.99	38
Relative advantage of Team Central System	4.94	1.18	88
Relative advantage of EIMS	4.91	1.17	121
Relative advantage of iWhistle System	4.90	1.28	31
Relative advantage of QMS – Qpulse System	4.72	1.15	89
Relative advantage of KRA Hub	5.72	0.67	311
Relative advantage of ACHIEVE System	4.62	1.47	307
Relative advantage of Ejuris System	4.90	1.51	10

The sixth factor for adoption was adopter characteristics. Analysis of adopter characteristics was divided into two: (1) system champions and (2) adopter categorisation. Respondents were asked whether champions (i.e., staff who advocate for systems) play a role in promoting the use or adoption of new system by KRA staff. Figure 4.1 shows, majority agreed or somewhat agreed (79.11%) with the statement that system champions play a big role in promoting adoption whereas 5.06% disagreed. Only 1.9% stated they were not sure whether they play a role or not. This implies that champions play a significant role in promoting adoption of new technological systems by KRA staff.

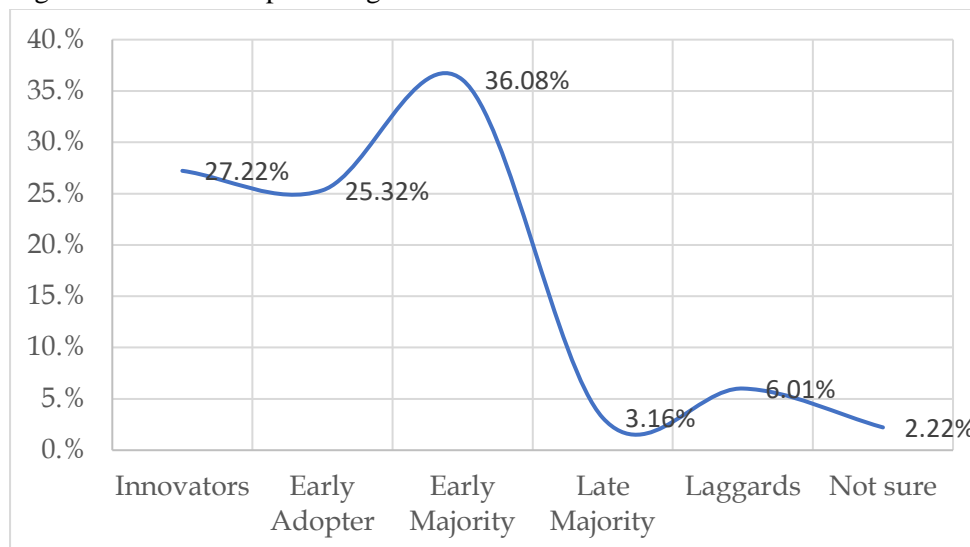
Figure 4.1: Respondents' level of agreement on System Champions' role in Adoption



In addition, respondents were asked to group themselves on a scale of 1 to 6 espousing Rogers (2003) bell-shaped categorisation of adopters on the basis of innovativeness where 1 – innovators, 2 – early adopters, 3 – early majority, 4 – Late majority, 5 – Laggards and 6 – Not sure. As shown in figure 4.2, majority of respondents (36.1%) classified themselves as early majority; 27.2% classified themselves

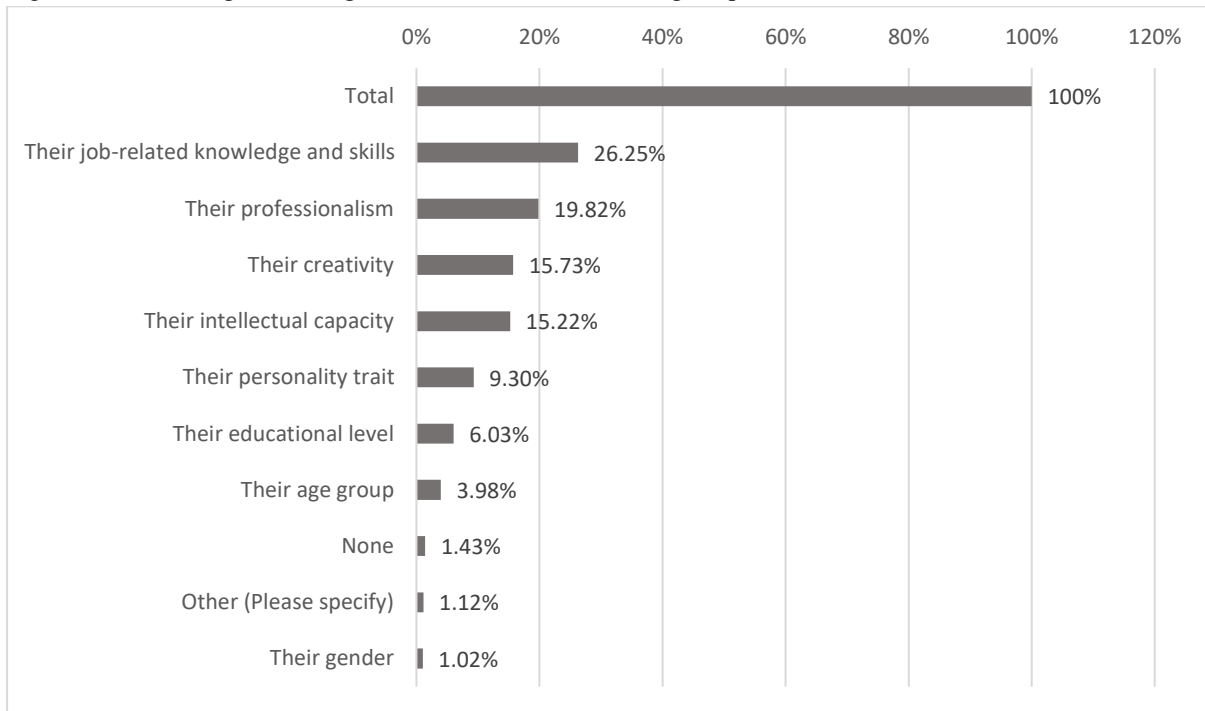
as innovators; 25.3% classified themselves as early adopters. A small proportion classified themselves as late majority and laggards i.e., 3.16% and 6.01% respectively. Only 2.22% of respondents stated they are not sure where they fall. The distribution of these adopter characteristics does not take the typical bell-shaped distribution postulated under the Rogers (2003) theory of DOI and upholds Moore's (1991) criticism of Roger's distribution curve. This analysis is subjective as it is based on self-perception.

Figure 4.2: KRA Adopter categorisation on the basis of innovativeness



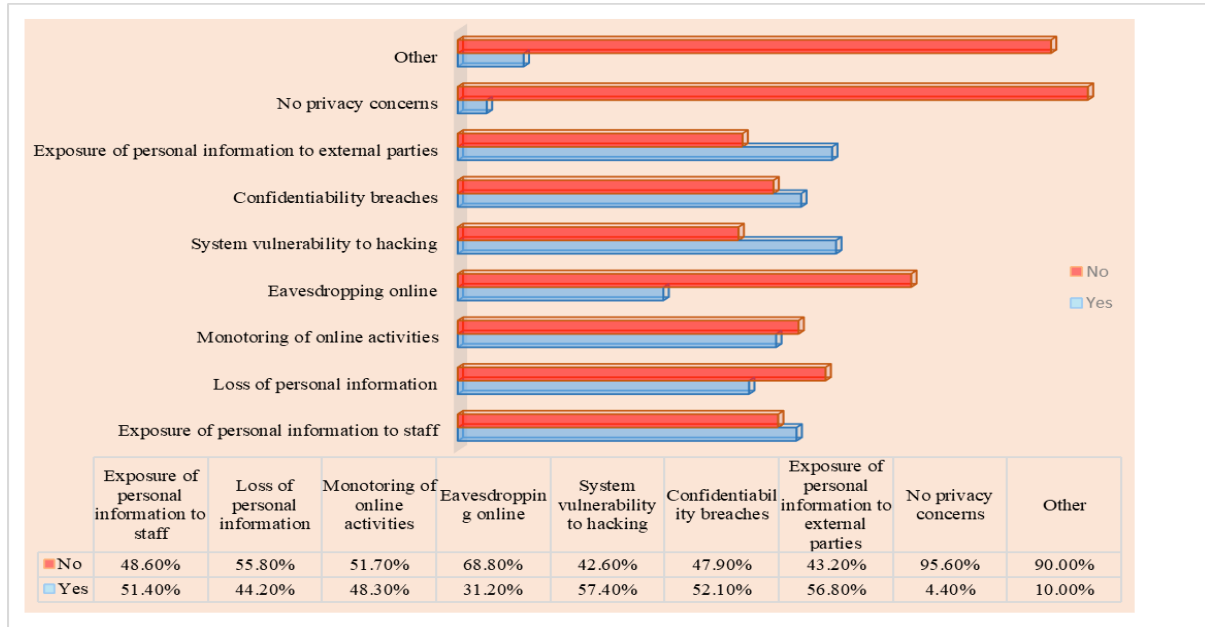
The seventh factor for adoption was manager characteristics i.e. supervisor's traits that can influence respondents' decision to adopt new systems within KRA. As shown in figure 4.3, majority of respondents (26.25%) were of the opinion that their manager's job-related knowledge and skills would influence their adoption of a new system. 19.82% chose professionalism followed by creativity and intellectual capacity taking a proportion of 15.73% and 15.22% respectively. Only 1.02% thought that gender of the supervisor can influence adoption. The least percentage of 0.1% were of the opinion that the political orientation of the manager can influence adoption. 1.12% of respondents suggested other manager traits, namely: attitude towards work, supportiveness, integrity, proactiveness, interpersonal skills and ability to offer guidance.

Figure 4.3: Percentage of Managers' characteristics influencing adoption



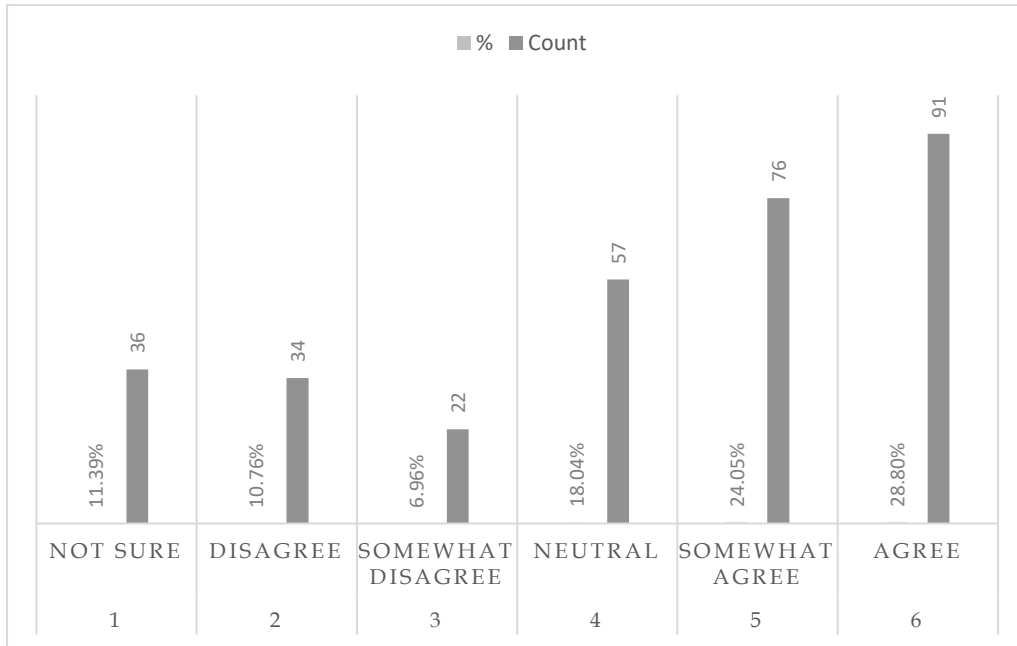
The eighth factor for adoption was threat to privacy referring to staff privacy concerns that would have negative influence on adoption of a new system. Respondents were given the option to select from a list of privacy concerns. As shown in figure 4.4, majority (57.4%) were of the opinion that perceived risk of hacking had the most negative influence on adoption. Followed by exposure of personal information to external parties, confidentiality breaches and exposure of personal information to staff at proportions of 56.8%, 52.1% and 52.4% respectively. Eavesdropping online had a lower percentage of 31.2% of respondents. 10% of respondents highlighted unreliability and victimisation as other privacy concerns that can influence adoption by staff. Only 4.4% of respondents had no privacy concerns. From this result, it can be concluded that hacking and having personal information revealed to publics can have a high negative influence on adoption of a new technologies by KRA staff.

Figure 4.4: Perceived threats to privacy influencing system adoption at KRA



The ninth factor for adoption was corporate governance with regards to whether KRA conducts regular innovation audits and management regularly reports on performance of technological innovations. Figure 4.5 presented findings in percentages relating to information measuring frequency of innovation audits and frequency of innovation policy reviews rated on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat Disagree, 4 – Neutral, 5 – Somewhat Agree and 6 – Agree. Majority (28.8%) agreed or somewhat agreed (24.05%) with the statement that KRA conducts regular innovation audits and senior management regularly reports on innovations’ performance. 10.76% of respondents disagreed while 11.39% were not sure whether this is the case. From this we can observe that a large percentage of staff believe that KRA has good governance policies for innovation management.

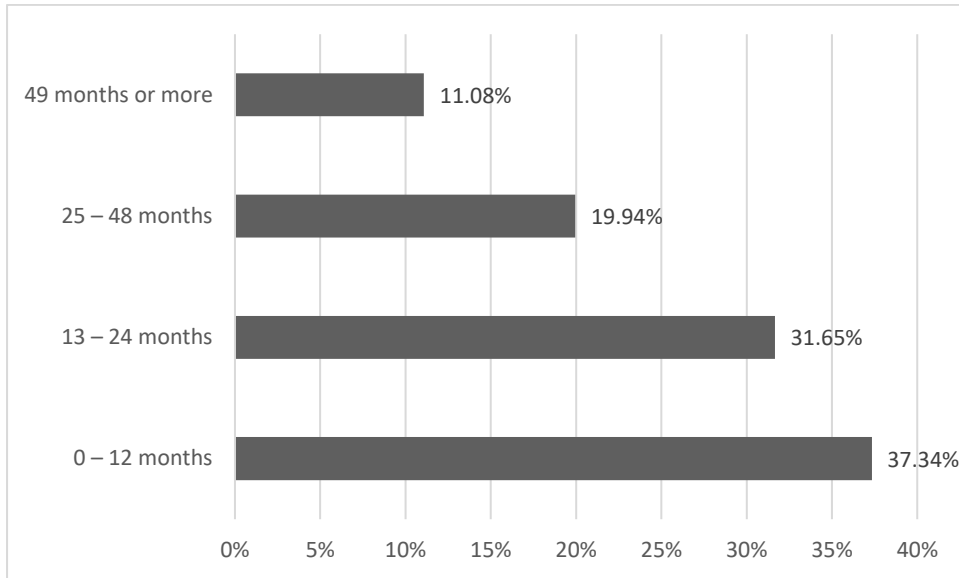
Figure 4.5: Respondents' level of agreement on Innovation audits conducted at KRA



Additionally, staff were asked to gauge the frequency by which KRA innovation policies and strategies are reviewed. As shown in figure 4.6, majority of respondents (37.34%) were of the opinion that KRA's innovation policies are reviewed annually, 31.65% thought they are reviewed within two years, while 19.94% thought KRA's innovation policies are reviewed within a period of 25 to 48 months. 11.08% thought review of policies is done after more than 4 years. From these findings we can observe that a large percentage of KRA staff believe that internal innovation policies are reviewed regularly after 1 or 2 years.



Figure 4.6: Frequency of review of Innovation policies and strategies at KRA



The tenth factor for adoption was incentives referring to whether receiving an incentive would influence adoption of a system. Table 4.11 presented findings in percentages, frequency, mean and standard deviation relating to information measuring perceived influence of incentives on adoption, rated on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 - Somewhat Disagree, 4 – Neutral, 5 – Somewhat Agree, and 6 – Agree. Majority agreed (38.92%) or somewhat agreed (22.47%) with the statement that receiving a positive incentive would influence their use of new systems while 14.87% disagreed suggesting that receiving a positive incentive would not influence their use of a new system. 5.38% were undecided on whether a positive incentive will or will not influence adoption. From this finding, it can be observed that when staff are positively incentivised they are likely to adopt new systems implemented by KRA.

Table 4.11: Respondent’s level of agreement on whether incentives influence adoption

	Mean	Std. Dev.
	4.50	1.63
Rating	Percentage of respondents	Frequency
Not sure	5.38%	17
Disagree	14.87%	47
Somewhat Disagree	4.75%	15
Neutral	13.61%	43
Somewhat Agree	22.47%	71
Agree	38.92%	123
Total	100%	316

Additionally, respondents were asked to suggest incentives that would be good to receive to influence use of new systems. Table 4.12 shows positive incentives proposed by staff, majority (20.47%)

suggesting trainings or education programs about the new systems will increase adoption. Incentives such as recognition, simplicity, out-of-office workshop, gifts and promotions were suggested by 14.62%, 8.19%, 7.6%, 5.26% and 4.68% of respondents respectively. Positive incentives specified as ‘other’ included: free laptops, vouchers, appointment as champions, commendation letters, redeemable points, involvement in implementation, branded merchandise, bonuses, feedback mechanism, public display of senior management using the system, certificates, trials, trivias, team building, Honorarium, prompt assistance for user challenges, free internet connectivity, and good articulation of benefits.

Table 4.12: Positive incentives that can influence adoption of KRA systems

Description of Positive rewards and incentives	Percentage of respondents	Frequency
Training / Education / Specialised training	20.47%	35
Recognition / Recognition on bulletins or publications	14.62%	25
Simplicity / User-friendly / Convenience	8.19%	14
Sensitisations / Workshops out of office	7.60%	13
Gifts / Awards / Rewards	5.26%	9
Staff promotions	4.68%	8
Gadgets / Computers / Laptops / iPads	4.09%	7
Vouchers / Shopping Vouchers / Lunch Vouvers	4.09%	7
Appointment as Champions	2.92%	5
Commendation letters	2.34%	4
Redeemable points / Awarding scores	2.34%	4
Involvement in Implementation / Roll-out	2.34%	4
Branded KRA or system-name Merchandise	2.34%	4
Bonus / Salary increment / Allowances	2.34%	4
Others (Please specify)	16.37%	28
Total	100.00%	171

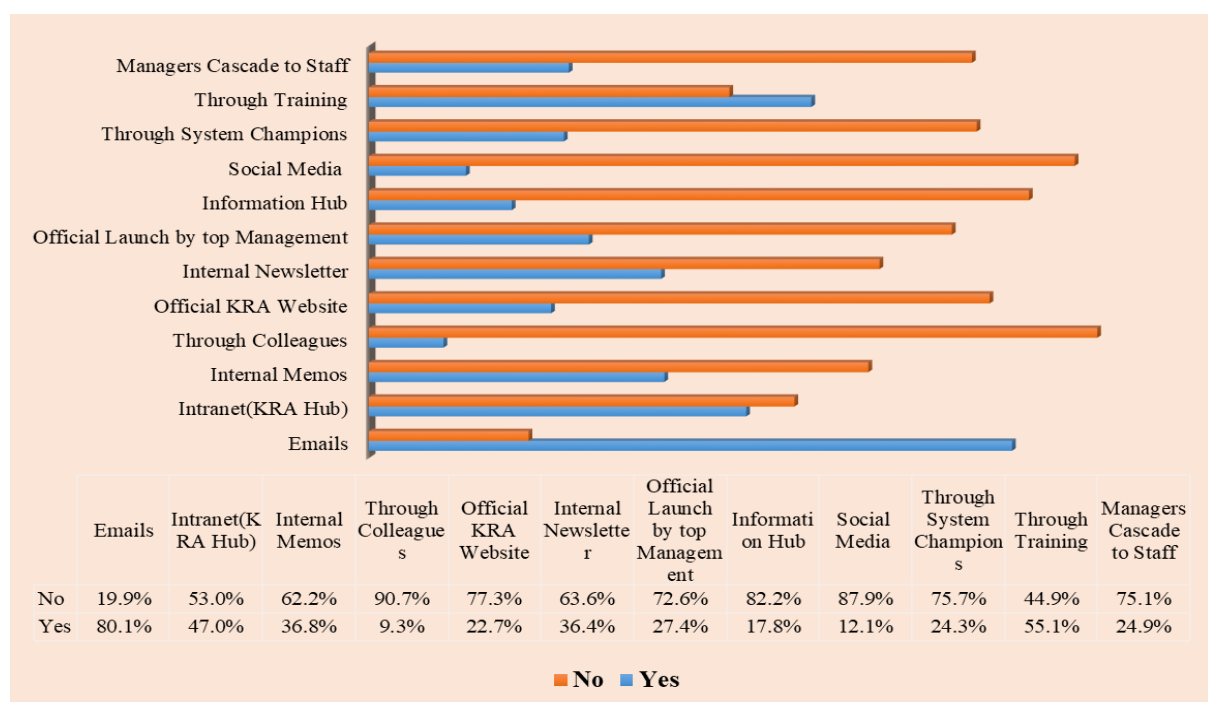
Moreover, table 4.13 shows negative incentives that are likely to influence adoption of new systems with majority highlighting coercion and threats as the major negative incentives that can influences system adoption by KRA staff.

Table 4.13: Negative incentives that can influence adoption of KRA systems

Description of Negative rewards and incentives	Percentage of respondents	Freq.
Coercion / Threats / Forceful implementation	50.0%	3
Mandatory / Obligatory use	16.67%	1
Corrective actions taken for non-usage	16.67%	1
Discouraging certain mistakes	16.67%	1
Total	100.00%	6

The eleventh factor for adoption was communication channels referring to the most effective channel for creating awareness about a new technological system at KRA. As shown in figure 4.7, majority (80.1%) were of the opinion that email is the most effective channel for communicating a new technological system to KRA staff. Followed by trainings (55.1%), intranet (47%), internal memos (36.8%) and newsletters (36.4%) respectively as effective means of communication to staff on newly launched systems. It can be observed that for KRA to effectively publicise any new system and ensure wide staff reach, the preferred communication channels would be emails, training, intranet, memos and newsletters in that order. It is important to note that one of the systems under investigation i.e., KRAHub was identified as an effective communication channel in itself.

Figure 4.7: Communication channels influence on adoption of KRA systems



The twelfth factor for adoption was external pressures (combining external factors, industry associations, networks and political factors) that can influence use of new systems at KRA. Table 4.14 presented mean, standard deviation, percentages and frequency relating to information measuring perceived effects of external pressures rated on a scale of 1 – 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat disagree, 4 – neutral, 5 – Somewhat agree and 6 – Agree. Majority agreed (26.58%) or somewhat agreed (21.52%) with the statement that external pressures would influence adoption of new while 20.25% and 7.59% of respondents disagreed or somewhat disagreed. 5.7% were undecided on whether external pressures will or will not influence their use of the new system. It can, therefore, be observed that on the one side, a good number agreed whereas on the other, a good number disagreed.

Therefore, when external pressures/factors like government directives or public advocacies are exerted on staff to use a new system, they may decide to use or not use the system.

Table 4.14: Influence of external pressures on adoption of KRA systems

	Mean	Std Dev.
	4.09	1.63
	Percentage of respondents	Freq.
Not sure	5.70%	18
Disagree	20.25%	64
Somewhat Disagree	7.59%	24
Neutral	18.35%	58
Somewhat Agree	21.52%	68
Agree	26.58%	84
Total	100%	316

The thirteenth factor for adoption was benchmarking referring to whether benchmarking visits can influence the use of new systems by KRA staff. Table 4.15 presented mean, standard deviation, percentages and frequency relating to information measuring perceived influence of benchmarking on adoption rated on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat agree, 3 – Somewhat disagree, 4 – Neutral, 5 – Somewhat agree and 6 – Agree. Majority (51.9%) agreed or somewhat agreed (28.48%) that benchmarking activities can influence their use of new systems. A small proportion of 1.58% and 5.38% of respondents somewhat disagreed or disagreed respectively. 1.9% of respondents were undecided on whether benchmarking would or would not influence adoption. From these findings, it can be observed that benchmarking can predict staffs’ decision to adopt a new system implemented at KRA.

Table 4.15: Influence of Benchmarking on adoption of KRA systems

	Mean	Std Dev.
	5.14	1.21
	Percentage of respondents	Freq.
Not sure	1.90%	6
Disagree	5.38%	17
Somewhat Disagree	1.58%	5
Neutral	10.76%	34
Somewhat Agree	28.48%	90
Agree	51.90%	164
Total	100%	316

The fourteenth factor for adoption was corruption referring to whether corruption can / has caused staff to be reluctant to use new systems at KRA. Table 4.16 presented frequency, percentages, mean and

standard deviation relating to information measuring perceived influence of corruption on adoption rated on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat disagree, 4 – neutral, 5 – Somewhat agree and 6 – Agree. Majority of respondents (27.22%) disagreed that corruption can or has influenced their decision to use or not use a new system. However, this majority is closely followed by a proportion of 20.25% and 19.62% of respondents who somewhat agreed and agreed respectively that corruption can or has influenced staffs’ decision to adopt new system. 8.23% of respondents were not sure whether corruption can or has caused staff to be reluctant to use new systems. From the findings it can be observed that corruption is a factor that may or may not influence staffs’ adopt of new systems implemented within KRA.

Table 4.16: Influence of corruption on adoption of KRA systems

	Mean	Std Dev.
	3.69	1.68
	Percentage of respondents	Freq.
Not sure	8.23%	26
Disagree	27.22%	86
Somewhat Disagree	11.08%	35
Neutral	13.61%	43
Somewhat Agree	20.25%	64
Agree	19.62%	62
Total	100%	316

4.4.3 Influence of Adoption on Staff performance

The study sought to establish the influence of system adoption on staff work performance at KRA. Table 4.17 presented mean, standard deviation and frequency relating to information on respondents’ agreement on whether adoption the new systems has improved staff work performance rated on a scale of 1 to 6. Where 1 – Not sure, 2 – Somewhat disagree, 3 – disagree, 4 – neutral, 5 – Somewhat agree and 6 – agree. Table 4.17 shows, majority of respondents were in agreement that KRA Hub, iTax, Simba System and iCMS have significantly improved their work performance and productivity respectively. The highest proportion of respondents disagreed that iConnect, KRA website and ACHIEVE have improved their work performance respectively.

Table 4.17: Influence of adoption of KRA systems on staff performance

System	Mean	Std Dev.	Freq.
Simba System significantly improved staff performance	5.48	1.08	129
New KRA Website significantly improved staff performance	4.56	1.54	278
iTax System significantly improved staff performance	5.55	1.01	288

iKnow System significantly improved staff performance	4.80	1.24	225
iConnect System significantly improved staff performance	4.24	1.53	93
iCMS System significantly improved staff performance	5.40	1.08	111
iCARE System significantly improved staff performance	4.77	1.19	48
iNNovate System significantly improved staff performance	5.11	0.99	38
Team Central significantly improved staff performance	4.94	1.18	88
EIMS significantly improved staff performance	4.91	1.17	121
iWhistle System significantly improved staff performance	4.90	1.28	31
QMS – Qpulse significantly improved staff performance	4.72	1.15	89
KRA Hub significantly improved staff performance	5.72	0.67	311
ACHIEVE System significantly improved staff performance	4.62	1.47	307
Ejuris System significantly improved staff performance	4.90	1.51	10

In addition, respondents were asked to rank the systems based on how it has/ can improve staff work performance. Where 1 was the highest ranked while 15 was the lowest ranked. Table 4.18 shows that, majority ranked iTax, Simba System, KRAHub and iCMS respectively as the best systems in improving staff performance. These were followed by KRA Website and iKNOW which were both ranked at an average rank score of 4. Ejuris and iWhistle systems were ranked lowest by staff in their capabilities to improve staff performance and productivity. However, Q-Pulse system had a higher mean with the lowest standard deviation, hence can be termed as the lowest ranked system for staff work performance.

Table 4.18: Ranking of KRA systems based on influence on staff work performance

System	Mean	Std Dev.	Freq.
Simba System	2.61	1.88	129
New KRA Website	4.17	2.07	278
iTax	2.12	1.59	288
iKnow	4.33	1.92	225
iConnect	5.92	2.05	93
iCMS	3.96	2.54	111
iCARE	6.75	2.89	48
iNNovate	6.53	2.70	38
Team Central	5.44	2.11	88
EIMS	6.57	2.25	121
iWhistle	6.90	2.45	31
QMS – Qpulse	6.69	2.05	89
KRA Hub	3.32	2.17	311
ACHIEVE	5.02	2.46	307
Ejuris	7.60	3.98	10

4.4.4 Influence of Adoption on Revenue Collection

The study sought to establish the influence of system adoption on revenue collection at KRA. Table 4.19 presented the mean, standard deviation and frequency relating to information measuring the respondents' agreement on whether adoption of technological innovations increased revenue collection rated on a scale of 1 to 6. Where 1 – Not sure, 2 – Disagree, 3 – Somewhat disagree, 4 – Neutral, 5 – Somewhat Agree and 6 – Agree. Table 4.17 shows, majority of respondents thought iTax, Simba System and iCMS respectively, have led to an increase in revenue collection. Since these three systems are revenue collection systems, we can observe that they have directly influenced increased revenue collection at KRA. Majority of respondents were of the opinion that non-revenue systems such as iWhistle, Ejuris and iNNonate respectively, have indirectly influenced increase revenue through whistleblowing on tax evasion schemes, alternative tax dispute resolution under Ejuris. KRAHub which follows with a mean of 4.71, provides daily updates on information that can aid revenue officials in carrying out their day-to-day responsibilities. Majority of respondents disagreed that iConnect and EIMS have contributed to increased revenue collection.

Table 4.19: Descriptive Statistics on influence of adoption on Revenue Collection

Description	Mean	Std Dev.	Freq.
Simba System's influence on revenue collection	5.69	0.87	129
New KRA Website's influence on revenue collection	4.19	1.67	278
iTax System's influence on revenue collection	5.83	0.72	288
iKnow System's influence on revenue collection	4.17	1.54	225
iConnect System's influence on revenue collection	3.96	1.45	93
iCMS influence on revenue collection	5.60	1.03	111
iCARE System's influence on revenue collection	4.23	1.52	48
iNNovate System's influence on revenue collection	4.74	1.23	38
Team Central System's influence on revenue collection	4.11	1.57	88
EIMS influence on revenue collection	3.93	1.42	121
iWhistle System's influence on revenue collection	5.03	1.47	31
QMS – Qpulse System's influence on revenue collection	4.10	1.41	89
KRA Hub's influence on revenue collection	4.71	1.51	311
ACHIEVE System's influence on revenue collection	4.10	1.61	307
Ejurus System's influence on revenue collection	4.80	1.54	10

Respondents were also asked to answer yes, no or may be to a question on whether technological innovations contributed to increased revenue collection where yes=3, may be=2 and no=1. Table 4.20 presented mean, standard deviation, percentages and frequency showing that majority (91.14%) were of the opinion that the use of new technological systems had contributed significantly to increased revenue. Only 0.32% of respondents thought that use of new technological systems has not contributed to increased revenue collection while 8.54% were of the opinion that these new systems may or may not have contributed to increased revenue. This result implies that staff perceive that new technologies

have significantly contributed to increased revenue collection and KRA should continue investing in new or enhanced technologies to realise an even greater increase in revenue collection.

Table 4.20: Respondents' level of agreement on influence of DOI on revenue collection

	Mean	Std Dev.
	1.09	0.30
Answer	Percentage of respondents	Freq.
Yes	91.14%	288
May be	8.54%	27
No	0.32%	1
Total	100%	316

Additionally, respondents were asked to suggest innovative revenue collections systems that have been successfully implemented by other tax administrations, but are new to KRA. The innovative systems proposed included: Block chain technology, Case Management System, Artificial Intelligence, Tax Appeal Tribunal (TAT) System, Cash-less transaction operators, Atomic Revenue System (ARS), Automated text messages to Taxpayers when PAYE is remitted, Automatic Exchange of Information System (AEOI), Geo-mapping property System, Use of Drones, Increased scanner machines, Integration of Domestic Tax system and Customs system, Automatic Refund System, Simplified revenue collection system, Big Data system, Cadastral Tax System for property taxes, Mpesa STK-Push Integration, enhanced Asycuda System and Enterprise Service Bus (ESB).

4.5 Inferential Analysis

Inferential statistics allows you to make predictions (inferences) from a sample and make generalisations about a population under investigation. Asadoorian and Kantarelis (2005) state that it utilises probabilistic techniques to analyse sample information from a certain population (known part), to improve our knowledge about the population (unknown part). For inferential statistics the study used correlation analysis and regression analysis to measure the strength of association between the dependent and independent variable(s) and the direction of their relationships.

4.5.1 Correlation Analysis

Correlation analysis is a statistical technique that measures the strength of the linear association between two variables and the direction of the relationship. Pearson's correlation coefficient was used to assess the relationship between independent variables (IV) given the dependent variable (DV). Where 1 to 0.9 is very high correlation, 0.9 to 0.7 is a high correlation, 0.7 to 0.5 is a moderate correlation, 0.5 to 0.3 is a weak correlation and less than 0.3 is little or no correlation. A correlation matrix in Table 4.21

shows the result of Pearson correlation test and relationship directions of the IV given the DV with a 2-tailed significance level. Multicollinearity between independent variables was also determined.

Complexity and Adoption: Analysis shows a linear relationship ($r(316) = -0.540$; $p=0.000 < 0.05$) between complexity and adoption at KRA. This implies that complexity of a system has a moderate negative association with adoption, that was statistically significant at 0.01 level of significance as indicated by $p=0.0000$. As complexity of a system increases, adoption by KRA staff decreases. Showing that complexity can decrease system adoption hence can be observed as a major contributory factor.

Compatibility and Adoption: Analysis shows a linear relationship ($r(316) = 0.418$; $p=0.000 < 0.05$) between compatibility and adoption at KRA. This implies that compatibility has a weak positive association with adoption, that was statistically significant at 0.01 level of significance, as indicated by $p=0.0000$. As compatibility with job needs increases, adoption by KRA staff increases. Showing that compatibility can increase system adoption hence can be observed as a major contributory factor.

Triability and Adoption: Analysis shows a linear relationship ($r(316) = 0.143$; $p=0.011 < 0.05$) between triability and adoption at KRA. This implies that triability has a weak positive association with adoption, that was statistically significant at 0.05 level of significance, as indicated by $p=0.011$. This result shows that if the new system allows for use on a trial basis, then adoption of the system increases. Therefore, triability can increase system adoption hence can be observed as a major contributory factor.

Observability and Adoption: Analysis shows a linear relationship ($r(316) = 0.259$; $p=0.0000 < 0.05$) between observability and adoption at KRA. This implies that observability of system benefits has a weak positive association with adoption, but is statistically significant at 0.01 level of significance, as indicated by $p=0.000$. This result shows that if new systems have clear benefits to users, then adoption increases. Therefore, observability can increase adoption hence can be observed as a major factor.

Relative advantage and Adoption: Analysis shows a linear relationship ($r(316) = 0.1030$; $p = 0.0674 > 0.05$) between relative advantage and adoption at KRA. This implies that relative advantage of a new system over its predecessor has a very little positive correlation with adoption and is not statistically significant, as indicated by $p=0.0674$. Showing that increase in relative advantage of a new system over an old system does not lead to an increase in the system's adoption rate hence is not a major factor.

Adopter characteristics and Adoption: Analysis shows a linear relationship ($r(316) = 0.176$; $p=0.018 < 0.05$) between adopter characteristics and adoption at KRA. This implies that adopter characteristics of staff has a small positive association with adoption, but was statistically significant at

0.05 level of significance, as indicated by $p=0.018$. This result shows that as potential users exhibit high innovator characteristics, adoption increases hence can be observed as a major factor.

Manager characteristics and Adoption: Analysis shows a linear relationship ($r(316) = 0.003$; $p=0.956 > 0.05$) between manager characteristics and adoption at KRA. This implies that manager characteristics has a very little positive association to adoption and is not statistically significant, as indicated by $p=0.956$. Meaning that managers' traits do not have influence on adoption of new systems by KRA staff hence is not a major factor.

Threat to privacy and Adoption: Analysis shows a linear relationship ($r(316) = -0.022$; $p=0.699 > 0.05$) between perceived threat to privacy and adoption at KRA. This implies that perceived threat to privacy has very little negative association to adoption and is not statistically significant, as indicated by $p=0.699$. Indicating that high perceived threat to privacy does not influence adoption of new systems by KRA staff hence is not a major factor.

Corporate Governance and Adoption: Analysis shows a linear relationship ($r(316) = 0.126$; $p=0.025 < 0.05$) between corporate governance and adoption at KRA. This implies that corporate governance that fosters innovation has a very little positive association with adoption, but is statistically significant, as indicated by $p=0.025$. Denoting that as good corporate governance around innovation performance increases, there is a positive improvement in adoption hence is a major factor.

Incentives and Adoption: Analysis shows a linear relationship ($r(316) = 0.049$; $p=0.387 > 0.05$) between incentives and adoption at KRA. This implies that incentives given to motivate use of new systems has a very small positive association to adoption and is not statistically significant, as indicated by $p=0.387$. Indicating that incentives do not influence adoption of technological innovations by KRA staff hence is not a major factor.

Communication channels and Adoption: Analysis shows a linear relationship ($r(316) = 0.204$; $p=0.015 < 0.05$) between communication channels and adoption at KRA. This implies that use of effective communication channels has a very little positive association with adoption, but is statistically significant, as indicated by $p=0.015$. Inferring that correct choice of communication channels will result in an increase in system adoption by KRA staff hence can be observed as a major factor.

External pressures and Adoption: Analysis shows a linear relationship ($r(316) = 0.017$; $p=0.758 > 0.05$) between external pressures and adoption at KRA. This implies that there is a very little positive association between external pressures and adoption of new technologies is not statistically significant,

as indicated by $p=0.758$. Hence, increased pressure on staff from external influences, is not a major contributory factor for increased adoption of new systems.

Benchmarking and Adoption: Analysis shows a linear relationship ($r(316) = 0.212$; $p=0.027 < 0.05$) between benchmarking activities and adoption at KRA. This implies that benchmarking has a very little positive association with adoption of new systems, but is statistically significant at 0.05 level of significance, as indicated by $p=0.027$. Indicating that an increase in benchmarking initiatives for system technologies will result in a significant increase in adoption by staff hence is a major factor.

Corruption and Adoption: Analysis shows a linear relationship ($r(316) = -0.148$; $p=0.001 < 0.05$) between corruption and adoption at KRA. This implies that corruption has a very little negative association with adoption of new technological systems, but is statistically significant at 0.01 and 0.05 levels of significance, as indicated by $p=0.001$. Implying that an increase in corrupt activities by KRA staff will result in a decrease in adoption of a new system by these staffs hence is a major factor.

Adoption and staff work performance: Analysis shows a linear relationship ($r(316) = 0.472$; $p=0.000 < 0.05$) between adoption and KRA staff performance. This implies that adoption of technological innovations has a moderate positive association with staff performance and is statistically significant at 0.01 levels of significance, as indicated by $p=0.0000$. Implying that an increase in adoption of new systems by KRA staff results in a statistically significant increase in work performance.

Adoption and revenue collection: Analysis shows a linear relationship ($r(316) = 0.523$; $p=0.000 < 0.05$) between adoption and revenue collection at KRA. This implies that adoption has a moderate positive association with revenue collected and the correlation was statistically significant at 0.01 level of significance, as indicated by $p=0.000$. Inferring that an increase in adoption of new technological systems by KRA staff results in a statistically significant increase in revenue collected by KRA.

Table 4.21: Correlation Matrix

		X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅	X ₁₆	Y
X₁	Pearson Correlation	1																
	Sig. (2-tailed)	-																
	N	316																
X₂	Pearson Correlation	.058*	1															
	Sig. (2-tailed)	0.015	-															
	N	316	316															
X₃	Pearson Correlation	-.042	.279**	1														
	Sig. (2-tailed)	0.556	0.000	-														
	N	316	316	316														
X₄	Pearson Correlation	0.0076	0.435**	-0.038	1													
	Sig. (2-tailed)	0.893	0.001	0.503	-													
	N	316	316	316	316													
X₅	Pearson Correlation	-0.0270	0.212**	-.987**	0.0787	1												
	Sig. (2-tailed)	0.632	0.0002	0.000	0.1627	-												
	N	316	316	316	316	316												
X₆	Pearson Correlation	0.198	0.132**	0.082	.222**	0.039	1											
	Sig. (2-tailed)	0.996	0.001	0.145	0.000	0.491	-											
	N	316	316	316	316	316	316											
X₇	Pearson Correlation	0.074	-0.119*	-0.057	0.350	0.092	0.10	1										
	Sig. (2-tailed)	0.189	0.035	0.309	0.102	0.0631	0.246	-										
	N	316	316	316	316	316	316	316										
X₈	Pearson Correlation	0.000	-0.034	0.082	0.105*	0.095	-0.124*	.518**	1									
	Sig. (2-tailed)	0.996	0.544	0.145	0.042	0.165	0.027	0.008	-									
	N	316	316	316	316	316	316	316	316									
X₉	Pearson Correlation	0.1595	0.184**	0.138**	.192**	.163**	.210**	0.001	0.07	1								
	Sig. (2-tailed)	0.442	0.001	0.002	0.0006	0.0037	0.0092	0.993	0.212	-								
	N	316	316	316	316	316	316	316	316	316								
X₁₀	Pearson Correlation	0.07	0.09	0.21**	-0.024	0.211**	0.086	0.035	0.031	-0.025	1							
	Sig. (2-tailed)																	
	N																	



		X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅	X ₁₆	Y
X ₁₁	Sig. (2-tailed)	0.766	0.278	0.007	0.763	0.0001	0.095	0.54	0.584	0.661	-							
	N	316	316	316	316	316	316	316	316	316	316							
	Pearson Correlation	-0.051	-0.177**	0.000	0.35	0.92	-0.122*	0.373**	0.481**	-0.107	0.082	1						
X ₁₂	Sig. (2-tailed)	0.368	0.002	0.994	0.0645	0.063	0.03	0.0001	0.0000	0.057	0.148	-						
	N	316	316	316	316	316	316	316	316	316	316	316						
	Pearson Correlation	0.102	0.08	0.151**	-0.021	0.161**	0.077	0.024	-0.086	0.152**	0.173**	-0.091	1					
X ₁₃	Sig. (2-tailed)	0.279	0.061	0.007	0.789	0.0051	0.173	0.668	0.125	0.007	0.002	0.111	-					
	N	316	316	316	316	316	316	316	316	316	316	316	316					
	Pearson Correlation	0.078	0.152*	0.0203	0.523	0.0385	0.239**	-0.075	-0.005	0.1258**	0.165**	-0.052	0.284**	1				
X ₁₄	Sig. (2-tailed)	0.209	0.01	0.14	0.3508	0.4948	0.000	0.184	0.931	0.009	0.004	0.36	0.000	-				
	N	316	316	316	316	316	316	316	316	316	316	316	316	316				
	Pearson Correlation	0.0433	0.0087	0.1242*	0.0121	0.1248*	0.095	-0.018	-0.067	0.0709	0.156**	-0.037	0.270**	.199**	1			
X ₁₅	Sig. (2-tailed)	0.968	0.621	0.022	0.831	0.0265	0.093	0.749	0.234	0.062	0.005	0.513	0.000	0.000	-			
	N	316	316	316	316	316	316	316	316	316	316	316	316	316	316			
	Pearson Correlation	0.192**	0.714**	0.277**	0.105*	0.067*	0.241**	-0.138*	-0.035	0.220**	0.130*	-0.237	0.109	.158**	0.08	1		
X ₁₆	Sig. (2-tailed)	0.001	0.000	0.000	0.012	0.032	0.000	0.014	0.531	0.000	0.021	0.000	0.054	0.005	0.153	-		
	N	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316		
	Pearson Correlation	.955**	.123*	.048	.102	.239	.016	.073	.023	0.025	0.032	-0.056	-0.069	-0.078	-.007	.164**	1	
Y	Sig. (2-tailed)	0.000	0.029	0.399	0.145	0.504	0.771	0.197	0.686	0.662	0.654	0.321	0.223	0.167	0.895	0.003	-	
	N	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	
	Pearson Correlation	-.540**	0.418**	0.143*	0.259**	0.103	0.176*	0.003	-0.022	0.126*	0.049	0.204*	.017	.212*	-.148**	.472**	.52**	1
Y	Sig. (2-tailed)	0.000	0.000	0.011	0.000	0.0674	0.018	0.956	0.699	0.025	0.387	0.015	0.758	0.027	0.001	0.000	0.000	-
	N	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316

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

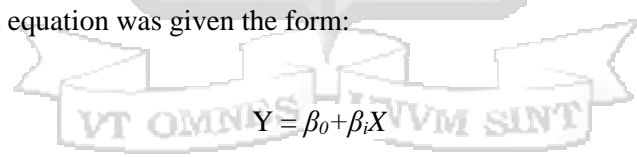
** Correlation is significant at the 0.01 level (2-tailed).

Where: X₁ is Complexity, X₂ is Compatibility, X₃ is Triability, X₄ is Observability, X₅ is Relative advantage, X₆ is Adopter characteristics, X₇ is Manager characteristics, X₈ is Threat to privacy, X₉ is corporate governance, X₁₀ is incentives, X₁₁ is Communication channels, X₁₂ is External pressures, X₁₃ is Benchmarking, X₁₄ is Corruption, X₁₅ is Staff work performance, X₁₆ is Revenue collection and Y is Adoption Rate

The correlation matrix was used to check for multicollinearity between independent variables. Multicollinearity occurs when two independent variables in a regression model have a high linear relationship. It can lead to problems when fitting the model and subsequently to misinterpretation of the regression model and it affects coefficients and p-values. A correlation coefficient greater than 0.7 (i.e., $r > 0.7$) between two independent variables indicates a high correlation. Variables that showed high collinearity were: (i) relative advantage and triability at a statistically significant magnitude of -0.987, (ii) complexity and revenue collection at a statistically significant magnitude of 0.955 and (iii) compatibility and staff performance at a statistically significant magnitude of 0.714.

4.5.2 Regression Analysis

Regression Analysis is a form of predictive analysis through which one is able to understand how values of the dependent variable change when one of the independent variables is varied, while the other independent variables are held constant. Bivariate regression analysis was used to analyse the relationship between a single DV (i.e., DOI or Adoption rate) and single predictor IV (i.e., each of the internal and external factors) and results used to test the hypothesis and identify CSFs. Simple bivariate analysis was also used to evaluate the influence of adoption on staff performance and revenue collection. A multivariate regression was used to regress all the CSFs together to determine the key CSF for adoption at KRA. The f-test was used to determine validity of the model while R squared (R^2) or coefficient of determination was used as a measure of the model's goodness of fit. Analysis of Variance (ANOVA) was used to check whether the models fitted on the data are statistically significant. The bivariate regression equation was given the form:



$$Y = \beta_0 + \beta_i X$$

Where: Y is the adoption rate, X is the independent/ predictor variable, β_0 is the y intercept, while β_i are the coefficients of the x values. The X stands for: X1 is Complexity, X2 is Compatibility, X3 is Triability, X4 is Observability, X5 is Relative advantage, X6 is Adopter characteristics, X7 is Manager characteristics, X8 is Threat to privacy, X9 is corporate governance, X10 is incentives, X11 is Communication channels, X12 is External pressures, X13 is Benchmarking, X14 is Corruption, X15 is Staff work performance, X16 is Revenue collection and Y is Adoption Rate. The outcomes of the study are adoption rate, staff work performance and revenue collection. The regressors of the study are the internal and external factors identified.

Complexity and Adoption: Regression results for complexity and adoption in table 4.22 shows an overall relationship ($F(1,314) = 129.05$; $p = 0.000 < 0.05$). P-value for the f-test is statistically significant at 0.01, indicating there is a 0.000 chance that results of the model are due to other events. This implies

model has explanatory power for predicting the influence of complexity on adoption at KRA. The R² value; proportion of variation in adoption rate explained by complexity, is 0.2913 i.e., 29.13%. The remaining 70.87% can be explained by other factors excluded from the model. P-values of 0.000 for t-tests for both coefficients are statistically significant at 0.01. This means that complexity has a statistically significant effect on system adoption by KRA staff.

Table 4.22: Regression results for Complexity of KRA systems and Adoption

		R-squared =	0.2913	Number of obs. =		316
		Adj R-squared =	0.2890	F (1,314) =		129.05
				Prob > F =		0.0000
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]	
X ₁	-0.2638195	0.0232239	11.36	0.000	-0.3095136	-0.21818254
_cos	2.555857	0.0528611	48.35	0.000	2.451851	2.659864

When complexity is zero (0) i.e., it is held constant, the adoption is 2.5559. Therefore, for a one (1) unit increase in complexity of a new system, there is a 0.2683 unit decrease in the adoption rate of that system by KRA staff. Thus, yielding a model $Y=2.5559-0.2638X_1$. Where Y is the adoption rate and X₁ is complexity. From this finding, we reject the null hypothesis of no high negative relationship between complexity and adoption and conclude the alternative hypothesis that complexity of a new system negatively and significantly influences adoption by KRA staff.

Compatibility and Adoption: Regression results for compatibility and adoption in table 4.23 shows an overall relationship (F (1,314) =66.6; p=0.000<0.05). P-value for the F-test is statistically significant at 0.01, indicating a 0.000 chance that results of model are due to other events. The model has explanatory power for predicting the influence of compatibility on adoption at KRA. The R² value; proportion of variation in adoption rate explained by compatibility, is 0.1750 i.e., 17.5%. The remaining 82.5% can be explained by other factors excluded from the model. P-values of 0.000 for t-tests for both coefficients are statistically significant at 0.01. This means that compatibility has a statistically significant effect on system adoption by KRA staff.

Table 4.23: Regression results for Compatibility of the systems and Adoption

		R-squared =	0.1750	Number of obs. =		316
		Adj R-squared =	0.1724	F (1,314) =		66.60
				Prob>F =		0.0000
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]	
X ₂	0.3338587	0.0409097	8.16	0.000	0.2533669	0.4143505
_cos	2.18133	0.112357	19.41	0.000	1.960262	2.402398

When compatibility is zero (0) i.e., it is held constant, the adoption is 2.1813. Therefore, for a one (1) unit increase in compatibility of a new system with staff job needs, there is a 0.3338 unit increase in adoption rate by KRA staff. Thus, yielding a model $Y=2.18133+0.3339X_2$. Where Y is adoption rate

and X_2 is compatibility. From this finding, we reject the null hypothesis of no positive relationship between compatibility and adoption and conclude the alternative hypothesis that compatibility of a new system with staff job needs positively and significantly influences adoption by KRA staff.

Triability and Adoption: Regression results for triability and adoption in table 4.24 shows and overall relationship ($F(1,314) = 6.54$; $p = 0.0110 < 0.05$). P-value for the F-test is statistically significant at 0.05, indicating a 0.011 chance that the results of the model are due to random events. Implying that the model has explanatory power for predicting the influence of triability on system adoption at KRA. The R^2 value; the proportion of variation in adoption rate explained by triability, is 0.0204 i.e., 2.04%. The remaining 97.96% can be explained by other factors excluded from the model. P-value of 0.011 and 0.000 for the t-tests for both coefficients respectively are statistically significant at 0.05. This means that triability has a statistically significant effect on system adoption by KRA staff.

Table 4.24: Regression results for Triability of KRA systems and Adoption

		R-squared =	0.0204	Number of obs. =		316
		Adj R-squared =	0.0173	F (1,314) =		6.54
				Prob>F =		0.0110
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]	
X_3	0.1298259	0.0507753	2.56	0.011	0.029923	0.2297288
_cos	2.784649	0.1142051	24.38	0.000	2.559945	3.009353

When triability is zero (0) i.e., held constant, the adoption is 2.7846. Therefore, for a one (1) unit increase in the possibility to use the new system on a trial basis, there is 0.1298 unit increase in the adoption rate of that system by KRA staff. Thus, yielding a model $Y = 2.7846 + 0.1298X_3$. Where Y is the adoption rate and X_3 is the triability. From this finding we reject the null hypothesis of no positive relationship between triability and adoption and conclude the alternative hypothesis that triability of a new system positively and significantly influences adoption by KRA staff.

Observability and Adoption: Regression results for observability and adoption in table 4.25 shows an overall relationship ($F(1,314) = 22.62$; $p = 0.0000 < 0.05$). P-value for the F-test is statistically significant at 0.01, indicating there is 0.0000 chance that the results of the model are due to other events. Implying that the model has explanatory power for predicting the influence of observability on adoption at KRA. The R^2 -value; the proportion of variation in adoption rate explained by observability, is 0.0672 i.e., 6.72%. The remaining 93.28% can be explained by other factors excluded from the model. P-value of 0.000 for the t-test for coefficient for observability is statistically significant at 0.01 whereas the coefficient for the constant is not statistically significant as it is greater than 0.05. This means observability of system benefits has a statistically significant effect on system adoption by KRA staff.

Table 4.25: Regression results for Observability of KRA systems and Adoption

		R-squared =	0.06719	Number of obs. =		316
		Adj R-squared =	0.06422	F (1,314) =		22.62
				Prob>F =		0.0000
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]	
X ₄	1.2728	0.2676	4.756	0.000	0.2533669	0.4143505
_cos	1.3699	0.7089	1.932	0.054	1.960262	2.402398

When observability is zero (0), i.e., held constant, the adoption is 1.3699. Therefore, for a one (1) unit increase in observability of a new system’s benefits, there is a 1.2728 unit increase in the adoption rate of that system by KRA staff. Thus, yielding a model $Y=1.3699+1.2728X_4$. Where Y is the adoption rate and X₄ is observability. From this finding, we reject the null hypothesis of no positive relationship between observability and adoption and conclude the alternative hypothesis that observability of system benefits, positively and significantly influences system adoption by KRA staff.

Relative advantage and Adoption: Regression results for relative advantage and adoption in table 4.26 shows an overall relationship $F(1,314) = 3.37$; $p = 0.0674 > 0.05$. P-value of 0.06736 for the f-test is not statistically significant as it is greater than 0.05. Implying that the model does not have good explanatory power. The R²-value; the proportion of variation in adoption rate explained by relative advantage is 0.01062 i.e., 1.06%. The remaining 98.94% can be explained by other factors excluded from the model. P-value of 0.0674 for t-test for the coefficient for relative advantage is not statistically significant whereas the coefficient for the constant is statistically significant. This means relative advantage has no statistically significant effect on system adoption by KRA staff.

Table 4.26: Regression results for Relative Advantage of KRA systems and Adoption

		R-squared =	0.01062	Number of obs. =		316
		Adj R-squared =	0.0075	F (1,314) =		3.37
				Prob>F =		0.06736
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]	
X ₅	0.18000	0.09806	1.836	0.0674	0.4132415	0.6292308
_cos	4.13193	0.33066	12.496	0.0000	2.84723	1.429606

When relative advantage is zero (0), i.e., it is held constant, the adoption is 4.1319. Therefore, for a one (1) unit increase in relative advantage of a new system over an old system, there is a 0.18 unit increase in adoption rate by KRA staff. Thus, yielding a model $Y=4.1319+0.18X_5$. Where Y is adoption rate and X₅ is relative advantage. Therefore, we accept the null hypothesis and conclude that relative advantage does not positively or significantly influence system adoption by KRA staff.

Adopter characteristics and Adoption: Regression results for adopter characteristics and adoption in table 4.27 shows an overall relationship $(F(1,314) = 7.64$; $p=0.0120 < 0.05$). P-value for the F-test is statistically significant at 0.05, indicating a 0.012 chance that the results of the model are due to other

events. Implying the model has explanatory power for predicting the influence of adopter characteristics on adoption at KRA. The R^2 value; the proportion of variation in DOI explained by adopter characteristics, is 0.0238 i.e. 2.38%. The remaining 97.62% can be explained by other factors excluded from the model. P-values of 0.0120 and 0.000 for t-tests for both coefficients respectively are statistically significant at 0.05. This means that adopter characteristics have a statistically significant effect on system adoption by KRA staff.

Table 4.27: Regression results for Adopter characteristics and Adoption

		R-squared =	0.0238	Number of obs. =	316
		Adj R-squared =	0.0183	F (1,314) =	7.64
				Prob>F =	0.0120
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]
X ₆	0.360408	0.0267911	13.45	0.0120	0.029923 0.4297288
_cos	2.878335	0.1420773	20.26	0.000	2.598791 3.157879

When adopter characteristics is at zero (0) i.e., it is held constant, adoption is 2.8783. Therefore, for a one (1) unit increase in the adopter characteristics, there is 0.3604 unit increase in adoption rate of that system by KRA staff. Thus, yielding a model $Y=2.8783+0.3604X_6$. Where Y is adoption rate and X₆ is adopter characteristics. From this finding, we reject the null hypothesis of no positive relationship between adopter characteristics and adoption and conclude the alternative hypothesis that adopter characteristics positively and significantly influences adoption by KRA staff.

Manager characteristics and Adoption: Regression results for manager characteristics and DOI in table 4.28 shows an overall relationship (F (1,314) = 0.001; p=0.956>0.05). P-value for the F-test is not statistically significant as it is greater than 0.05, indicating that there is a 0.956 chance that the results of the model are due to other events. This implies manager characteristics is a poor predictor of adoption at KRA. The R^2 value; the proportion of variation in adoption rate explained by managers' characteristics is 0.0001 i.e., 0.01%. The remaining 99.99% can be explained by other factors outside the model. P-value for the t-test for the coefficient for manager characteristics is not statistically significant. This means that manager characteristics has no statistically significant effect on system adoption by KRA staff.

Table 4.28: Regression results for Manager Characteristics and Adoption

		R-squared =	0.0001	Number of obs. =	316
		Adj R-squared =	0.0000	F (1,314) =	0.001
				Prob>F =	0.956
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]
X ₇	0.0107	0.1959245	0.05	0.956	-0.3747908 0.3961909
_cos	3.045633	0.3402985	8.95	0.000	2.376079 3.715186

When manager characteristics is zero (0) i.e., held constant, adoption is 3.0456. Therefore, for a one (1) unit increase in manager characteristics that favour innovation, there is a 0.0107 unit increase in adoption rate by KRA staff. Thus, yielding a model $Y=3.0456+0.0107X_7$. Where Y is adoption rate and X_7 is manager characteristics. Therefore, we fail to reject the null hypothesis of no positive relationship between manager characteristics and adoption and conclude that manager characteristics does not positively or significantly influence adoption of new systems by KRA staff.

Threat to privacy and Adoption: Regression results for threat to privacy and adoption in table 4.29 shows an overall relationship (F (1,314) = 0.6990; p=0.6990>0.05). P-value for the F-test is not statistically significant at 0.05, indicating a 0.699 chance that the results of the model are due to other events. This implies that threat to privacy is a poor predictor of adoption at KRA. The R^2 value; the proportion of variation in adoption rate explained by threat to privacy is 0.0005 i.e., 0.05%. The remaining 99.95% can be explained by other factors excluded from the model. The p-value for the coefficient for perceived threat to privacy (0.699) is not statistically significant. This means threat to privacy has no statistically significant effect on system adoption by KRA staff.

Table 4.29: Regression results for perceived threat to privacy and Adoption

	R-squared =	0.0005	Number of obs. =	316	
	Adj R-squared =	-0.0027	F (1,314) =	0.15	
			Prob>F =	0.6990	
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]
X_8	-0.0461072	0.1191337	-0.39	0.699	-0.2805083 0.188294
_cos	3.136425	0.1897736	16.53	0.000	2.763037 3.509814

When perceived threat to privacy is zero (0) i.e., held constant, adoption is 3.1364. Therefore, for a one (1) unit increase in perceived threat to privacy of a new system, there is a 0.0461 unit decrease in adoption rate by KRA staff. Thus, yielding a model $Y=3.1364-0.0461X_8$. Where Y is adoption rate and X_8 is the perceived threat to privacy. Therefore, we fail to reject the null hypothesis of no significant negative relationship between perceived threat to privacy and adoption and conclude that perceived threat to privacy when accessing new systems does not negatively or significantly influence adoption of the new system by KRA staff.

Corporate Governance and Adoption: Regression results for corporate governance in table 4.30 show an overall relationship (F (1,314) = 5.09; p=0.0248<0.05). P-value for the F-test was statistically significant at 0.05, indicating there is 0.02 chance the results of the model are due to other events. Implying the model has predictive power on influence of corporate governance on adoption at KRA. The R^2 value; the proportion of variation in adoption rate explained by corporate governance is 0.0159 i.e., 1.59%. The remaining 98.41% can be explained by other factors outside the model. P-values of

0.025 and 0.000 for the t-tests for both coefficients respectively are statistically significant at 0.05. This means corporate governance has a statistically significant effect on system adoption by KRA staff.

Table 4.30: Regression results for Corporate Governance and Adoption

		R-squared	=	0.0159	Number of obs.	=	316
		Adj R-squared	=	0.0128	F (1,314)	=	5.09
					Prob>F	=	0.0248
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]		
X ₉	0.1304914	0.0578591	2.26	0.025	0.0166508	0.244332	
_cos	2.894564	0.0821754	35.22	0.000	2.73288	3.056247	

When corporate governance is zero (0) i.e., held constant, adoption is 2.8945. Therefore, for a one (1) unit increase in corporate governance, there is a 0.1304 unit increase in adoption rate of a new system by KRA staff. Thus, yielding a model $Y=2.8945+0.1304X_9$. Where Y is adoption rate and X₉ is corporate governance. Therefore, we reject the null hypothesis of no positive relationship between corporate governance and adoption and conclude the alternative that good corporate governance around innovation positively and significantly influences adoption of new systems by KRA staff.

Incentives and Adoption: Regression results for incentives and adoption in table 4.31 show an overall relationship (F (1,314) = 0.75; p=0.3869>0.05). P-value of 0.3869 for the F-test is not statistically significant at 0.05, indicating a 0.3869 chance that the results of the model are due to other events. Implying incentives is a poor predictor of adoption at KRA. The R² value; the proportion of variation in adoption rate explained by incentives is 0.0024 i.e., only 0.24%. The remaining 99.76% can be explained by other factors outside the model. P-value for the incentives coefficient (0.387) is not statistically significant whereas the p-value for the constant (0.000) is statistically significant. This means incentives has no statistically significant effect on system adoption by KRA staff.

Table 4.31: Regression results for Incentives and Adoption

		R-squared	=	0.0024	Number of obs.	=	316
		Adj R-squared	=	-0.0000	F (1,314)	=	0.75
					Prob>F	=	0.3869
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]		
X ₁₀	0.0177606	0.204971	0.87	0.387	-0.0225684	0.0580896	
_cos	2.984486	0.0977921	30.52	0.000	2.792075	3.176896	

When incentives are zero (0) i.e., held constant, adoption is 2.9845. Therefore, for a one (1) unit increase in the incentives to use a new system, there is a 0.0178 unit increase in adoption rate of that system by KRA staff. Thus, yielding a model $Y=2.9845+0.0178X_{10}$. Where Y is adoption rate and X₁₀ is incentives. From this finding, we fail to reject the null hypothesis of no significant positive relationship between incentives and DOI and conclude that incentives do not positively or significant influence adoption of new systems by KRA staff.

Communication channels and Adoption: Regression results for communication channel and adoption in table 4.32 show an overall relationship ($F(1,314) = 6.34$; $p=0.000 < 0.05$). P-value for the F-test is statistically significant at 0.01, indicating a 0.000 chance that the results of the model are due to other events. Implying the model has good predictive power on the influence of communication channels on adoption. The R^2 value; the proportion of variation in adoption rate explained by communication channels is 0.0199 i.e., 1.99%. The remaining 98.01% can be explained by other factors outside the model. The p-values for t-tests for both coefficients are statistically significant at 0.01. This means that communication channels have a statistically significant effect on system adoption by KRA staff.

Table 4.32: Regression results for Communication Channels and Adoption

		R-squared	=	0.0199	Number of obs.	=	316
		Adj R-squared	=	0.0128	F (1,314)	=	6.34
					Prob>F	=	0.000
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]		
X ₁₁	0.2794569	0.0151042	18.50	0.000	0.1825684	0.380896	
_cos	3.532174	0.251491	13.84	0.000	3.030156	4.034191	

When communication channel is zero (0) i.e., held constant, adoption is 3.5321. Therefore, for a one (1) unit increase in effective communication channels used to create awareness on a new system, there is 0.2794 unit increase in adoption rate of by KRA staff. Thus, yielding a model $Y=3.5321+0.2794X_{11}$. Where Y is adoption rate and X₁₁ is communication channels. Therefore, we reject the null hypothesis of no positive relationship between communication channels and adoption and conclude the alternative that communication channels significantly influence adoption of new systems by KRA staff.

External pressures and Adoption: Regression results for external pressures and adoption in table 4.33 shows an overall relationship ($F(1,314) = 0.10$; $p=0.7576 > 0.05$). P-value for the f-test is not statistically significant as it is greater than 0.05, indicating there is a 0.7576 chance the results of the model are due to other events. Implying that external pressures are not good predictors of adoption at KRA. The R^2 value; the proportion of variation in adoption rate explained by external pressures is 0.0003 i.e., 0.03%. The remaining 99.97% can be explained by other factors outside the model. P-value for the t-test for external pressures (0.758) was not statistically significant. This means that external pressures do not have a statistically significant effect on system adoption by KRA staff.

Table 4.33: Regression results for External pressures and Adoption

		R-squared	=	0.0003	Number of obs.	=	316
		Adj R-squared	=	-0.0029	F (1,314)	=	0.10
					Prob>F	=	0.7576
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]		
X ₁₂	0.0199536	0.0645883	0.31	0.758	-0.007127	0.1470342	
_cos	3.038249	0.0901932	33.69	0.000	2.860789	3.215708	

When external pressure is zero (0) i.e., held constant, adoption is 3.0382. Therefore, for a one (1) unit increase in external pressures to use a new system, there is a 0.0199 unit increase in adoption rate of that system by KRA staff. Thus, yielding a model $Y=3.0382+0.0199X_{12}$. Where Y is adoption rate and X_{12} is external pressure. Therefore, we fail to reject the null hypothesis of no significant positive relationship between external pressure and adoption and conclude that external pressures do not positively or significantly influence adoption of new systems by KRA staff.

Benchmarking and Adoption: Regression results for benchmarking and adoption in table 4.34 shows an overall relationship ($F(1,314) = 6.08$; $p=0.026 < 0.05$). P-value for the f-test is statistically significant at 0.05, indicating there is a 0.026 chance the results of the model are due to other events. Implying that the model has good predictive power on the influence of benchmarking on adoption at KRA. The R^2 value; the proportion of variation in adoption rate explained by benchmarking, is 0.0189 i.e., 1.89%. The remaining 98.11% can be explained by other factors outside the model. P-values of 0.026 and 0.000 for t-tests for both coefficients respectively are statistically significant at 0.05. This means that benchmarking has a statistically significant effect on system adoption by KRA staff.

Table 4.34: Regression results for benchmarking and Adoption

	R-squared	=	0.0189	Number of obs.	=	316
	Adj R-squared	=	0.0147	F (1,314)	=	6.08
				Prob>F	=	0.026
Y	Coef.	Std.Err	t	P> t	[95% conf. Interval]	
X_{13}	0.20457	0.0937684	2.18	0.026	0.1640368	0.240857
_cos	3.031607	0.1527653	19.84	0.000	2.731034	3.33218

When benchmarking is zero (0) i.e., held constant, adoption is 3.0316. Therefore, for a one (1) unit increase in benchmarking with similar systems in other organisations, there is a 0.2046 unit increase in adoption rate of a new system by KRA staff. Thus, yielding a model $Y=3.0316+0.2046X_{13}$. Where Y is adoption rate and X_{13} is benchmarking activities. Therefore, we can reject the null hypothesis of no positive relationship between benchmarking and adoption and conclude the alternative hypothesis that benchmarking positively and significantly influences adoption of new systems by KRA staff.

Corruption and Adoption: Regression results for corruption and adoption in table 4.35 shows an overall relationship ($F(1,314) = 7.54$; $p=0.002 < 0.05$). P-value for the f-test is statistically significant at 0.01 level of significance, indicating a 0.002 chance the results of the model are due to other events. Implying that the model has good predictive power on the influence of corruption on willingness to use a new system at KRA. The R^2 value; the proportion of variation in adoption rate explained by corruption, is 0.0235 i.e., 2.35%. The remaining 97.65% can be explained by other factors outside the model. P-values

of 0.002 and 0.000 for the t-tests for both coefficients respectively are statistically significant at 0.01. This means that corruption has a statistically significant effect on system adoption by KRA staff.

Table 4.35: Regression results for corruption and Adoption

	R-squared	=	0.0235	Number of obs.	=	316
	Adj R-squared	=	0.0185	F (1,314)	=	7.54
				Prob>F	=	0.002
Y	Coef.	Std.Err	t	P> t	[95% conf. Interval]	
X ₁₄	-0.525369	0.0612057	-8.58	0.002	0.267882	0.617296
_cos	3.002672	0.0790028	38.01	0.000	2.84723	3.158113

When corruption is zero (0) i.e., held constant, adoption is 3.0027. Therefore, for a one (1) unit increase in corruption by KRA staff, there is a 0.5254 decrease in the willingness to use a new system if staff perceive it will unearth or curb their corrupt activities. Thus, yielding a model $Y=3.0027-0.5254X_{14}$. Where Y is adoption rate and X₁₄ is corruption. Therefore, we reject the null hypothesis of no negative relationship between corruption and adoption and conclude the alternative hypothesis that corruption negatively and significantly influences adoption of new systems by KRA staff.

Adoption and staff performance: Regression results for influence of adoption on staff performance in table 4.36 shows an overall relationship (F (1,314) = 90.18; p=0.0000<0.05). P-value for the f-test is statistically significant at 0.01, 0.05 and 0.1 levels of significance, indicating a zero (0) chance that the results of the model are due to other events. Implying that the model has explanatory power for predicting the influence technological adoption on staff performance and productivity at KRA. The R² value; the proportion of variation in staff work performance explained by adoption is 0.2231 i.e., 22.31%. The remaining 77.69% can be explained by other factors outside the model. P-values for the t-tests for both coefficients are statistically significant at 0.01, 0.05 and 0.1. This means that adoption has a statistically significant effect on staff work performance.

Table 4.36: Regression results for influence of Adoption on Staff performance

	R-squared	=	0.2231	Number of obs.	=	316
	Adj R-squared	=	0.2206	F (1,314)	=	90.18
				Prob>F	=	0.0000
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]	
X ₁₅	0.5212361	0.054888	9.50	0.000	0.4132415	0.6292308
_cos	1.092567	0.1712992	6.38	0.000	2.84723	1.429606

When adoption rate is zero (0) i.e., held constant, staff performance is increased by 1.0926. Therefore, for a one (1) unit increase in adoption rate of a new system by staff, there is a 0.5212 unit increase in the staff's performance. Thus, yielding a model $Y=1.0926+0.5212X_{15}$. Where Y is staff performance and X₁₅ is adoption rate. Therefore, we reject the null hypothesis of no positive relationship between

adoption and staff work performance and conclude the alternative hypothesis that increased adoption of new technological systems positively and significantly influences staff performance at KRA.

Adoption and Revenue Collection: Regression results for influence of adoption on revenue collection in table 4.37 shows an overall relationship ($F(1,314) = 118.15; p=0.0000 < 0.05$). P-value for the f-test is statistically significant at 0.01, 0.05 and 0.1 levels of significance, indicating a zero (0) chance that the results of the model are due to other events. Implying that the model has explanatory power for predicting the influence of adoption on revenue collection. The R^2 value; the proportion of variation in revenue collection explained by adoption is 0.2734 i.e., 27.34%. The remaining 72.66% can be explained by other factors outside the model. The p-value for the t-test for the coefficient for revenue collection i.e., 0.000 is statistically significant, but the coefficient for the constant i.e., 0.092 is not. This means that adoption has a statistically significant effect on revenue collection at KRA.

Table 4.37: Regression results for influence of Adoption on Revenue Collection

		R-squared	=	0.2734	Number of obs.	=	316
		Adj R-squared	=	0.2711	F (1,314)	=	118.15
					Prob>F	=	0.0000
Y	Coef.	Std. Err	t	P> t	[95% conf. Interval]		
X ₁₆	0.883956	0.0813217	10.87	0.000	0.7239517	1.04396	
_cos	0.4290006	0.2537959	1.69	0.092	-0.0703549	0.9283561	

When adoption rate is zero (0) i.e., held constant, there is a 0.4290 unit increase in revenue collection. Therefore, for a one (1) unit increase in adoption rate of a new system by staff, there is a 0.8839 unit increase in revenue collection. Thus, yielding a model $Y=0.4290+0.8839X_{16}$. Where Y is revenue collection and X₁₆ is adoption rate. Therefore, we reject the null hypothesis of no positive relationship between adoption and revenue collection and conclude the alternative hypothesis that adoption of new systems positively and significantly influences revenue collection at KRA. Table 4.38 shows a summary of the findings with the determination of whether the independent variable is a CSF for adoption of technological innovations at KRA or not.

Table 4.38: Summary of Findings

Adoption of Innovation (DOI)							
Variables	Hypothesis Testing						(Critical or Not)
Internal	Coefficient	Std. Error	p-value	R-squared	Statistically significant (Yes or No)	Hypothesis Result	
Complexity	-0.2638	0.02322	0.0000	0.2913	Yes	High complexity is negatively related to adoption.	Critical
Compatibility	0.3339	0.0409	0.0000	0.1750	Yes	High compatibility is positively related to adoption.	Critical

Triability	0.1298	0.0508	0.0110	0.0204	Yes	High triability is positively related to adoption.	Critical
Observability	1.2728	0.2676	0.0000	0.0672	Yes	High observability is positively related to adoption.	Critical
Relative Advantage	0.1800	0.0981	0.0674	0.0106	No	High relative advantage is positively related to adoption.	Not Critical
Adopter Characteristics	0.3604	0.0268	0.0120	0.0238	Yes	Adopter characteristics is positively related adoption.	Critical
Manager characteristics	0.0107	0.1959	0.9560	0.0001	No	Manager characteristics is positively related to adoption.	Not critical
Threat to Privacy	-0.0461	0.1191	0.6990	0.0005	No	High threat to privacy is negatively related to adoption.	Not critical
Corporate Governance	0.1304	0.0579	0.0248	0.0159	Yes	High corporate governance around innovation is positively related to adoption.	Critical
Incentives	0.0178	0.2050	0.3869	0.0024	No	High incentive is positively related to adoption.	Not critical
Communication channels	0.2795	0.0151	0.0000	0.0199	Yes	communication channels are positively related to adoption.	Critical
External							
External Pressures	0.0199	0.0645	0.7576	0.0003	No	High external pressure is positively related to adoption.	Not critical
Benchmarking	0.2046	0.0938	0.0260	0.0189	Yes	High benchmarking is positively related to adoption.	Critical
Corruption	-0.5254	0.0612	0.0020	0.0235	Yes	High corruption is negatively related to adoption.	Critical
Outcomes							
Staff performance	0.5212	0.0549	0.000	0.2231	Yes	Adoption has a positive and significant influence on staff performance	N/A
Revenue collection	0.8839	0.0813	0.000	0.2734	Yes	Adoption has a positive and significant influence on revenue collection	N/A

Using the independent variables whose p-values were found to be statistically significant and identified as CSFs for adoption at KRA as shown in summary table 4.38, a multivariate regression analysis was conducted where the CSFs (i.e., complexity, compatibility, triability, observability, adopter characteristics, corporate governance, communication channels, benchmarking and corruption) were the regressors and the DOI (Adoption rate) was the dependent variable. The regression output is presented in table 4.39. The equation model used:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_6 X_6 + \beta_9 X_9 + \beta_{11} X_{11} + \beta_{13} X_{13} + \beta_{14} X_{14}$$

Where: Y is the adoption rate, X is the independent/ predictor variable, β_0 is the y intercept, while β_i are the coefficients of the x values. The X stands for: X1 is Complexity, X2 is Compatibility, X3 is Triability, X4 is Observability, X6 is Adopter characteristics, X9 is corporate governance, X11 is Communication channels, X13 is Benchmarking, X14 is Corruption, and Y is Adoption Rate.

Table 4.39: Results for Multivariate Regression of CSFs

R-squared	=	0.1405	Number of obs.	=	316
Adj R-squared	=	0.1181	F (1,314)	=	6.272
			Prob>F	=	0.0000
Y	Coef.	Std. Err	t	P> t	
X1 _Complexity	0.191144	0.071155	2.686	0.00762**	
X2 _Compatibility	0.167859	0.140429	1.195	0.23288	
X3 _Triability	0.086515	0.064348	1.344	0.17979	
X4 _Observability	0.964238	0.298728	3.228	0.00138**	
X6 _Adopter_Xtics	0.069933	0.070570	0.991	0.32248	
X9 _Corp_Governance	0.105630	0.050222	2.103	0.03626*	
X11 _Comm_Channels	0.279456	0.01510	3.009	0.16579	
X13 _Benchmarking	0.004518	0.070658	0.064	0.94905	
X14 _Corruption	-0.121446	0.049123	-2.472	0.01397*	
_cos	-0.036382	0.890792	-0.041	0.96745	

Using the variables whose p-values were found to be statistically significant at 5% level of significance and identified as CSFs for adoption, a further multivariate regression analysis was conducted to form a model for Complexity, Observability, Governance and Corruption as the independent variables and adoption rate (DOI) as the dependent variable. The regression output is presented in table 4.40.

Table 4.40: Results for Multivariate Regression of statistically significant CSFs

R-squared	=	0.1276	Number of obs.	=	316
Adj R-squared	=	0.1164	F (1,314)	=	11.37
			Prob>F	=	0.0000
Y	Coef.	Std. Err	t	P> t	
Complexity	0.20141	0.06983	2.884	0.0042**	
Observability	1.14326	0.26507	4.313	0.00000***	
Corp_Governance	0.12454	0.04906	2.539	0.0116*	
Corruption	-0.11009	0.04782	-2.302	0.0220*	
_cos	0.80351	0.75464	1.065	0.2878	

The resulting equation which is statistically significant at 5% level of significance is:

$$\text{Adoption rate} = 0.80351 + 0.20141(\text{Complexity}) + 1.14326(\text{Observability}) + 0.12454(\text{Corporate Governance}) - 0.11009(\text{Corruption})$$

CHAPTER 5: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter has tried to explain results and findings under chapter four above and linked these to the literature review and the research questions. It covers discussion of findings, conclusions, study contributions, recommendations, study limitations and suggested areas for further research.

5.2 Discussion of Findings

This section provides a comprehensive discussion of the findings from the data analysis conducted and presented in chapter four. It is organised into four subsections covering each research objective or research question of the study. Discussions are centered around the results of the objectives, interpretation of the findings, linkage to similar prior research and contrary arguments, linkages to the theory upon which this study is anchored and relevant arguments for drawing conclusions.

5.2.1 Assessing the Awareness rate & Adoption Rate

The first study objective sought to answer the research question: *“What is the awareness rate and adoption rate of technological innovations at KRA?”*

From the analysis in chapter four, staff are most aware of iTax, KRAHub, ACHIEVE and iKNOW platforms respectively and least aware of Ejuris and Team Central respectively. The most highly adopted systems are KRAHub, ACHIEVE and iTax. The systems that staff are most aware of but never used are iWhistle and iNNovate. Though staff have not interacted with some of these systems, they are aware of their existence through KRA Hub and other awareness campaigns. The average awareness rate for all 15 systems was found to be 91.08%. Showing that KRA has done a good job at creating awareness and should continue carrying out internal awareness campaigns for system upgrades or introduction of new systems. The study further sought to establish the acceptance level of these systems. The analysis results show that the most widely accepted systems were KRAHub, iTax, and Simba systems while iConnect and Ejuris are the least accepted. This implies that some systems are widely used and accepted while others are not and KRA can leverage on this and find out reasons why some of these systems are not gaining traction among staff.

The average adoption rate for all 15 systems was found to be 45.72%, implying a below average rate which is in line with staffs' perception that the speed at which new systems are adopted by KRA staff

is 26% and above. If this figure of 26% and above is tied to Rogers (2003) DOI theory, then the adoption rate of technological innovations at KRA has reached early majority stage. Meaning majority of KRA staff start use systems much later only for their practical benefits. And though staff are aware of systems' exist, a good number have not interacted with them probably because they do not have access, the systems do not directly touch on their day-to-day job roles, the systems do not address their job needs or simply because they lack interest. Since this 26% and above rate is an estimation, it is prone to a risk of underestimation or overestimation of the actual adoption rate, hence should be treated cautiously. Diagne and Demont (2007) state that estimations suffer from 'nonexposure' bias or selection bias which can yield inconsistencies and one can miss the mark even if the sample is randomly selected.

The distribution of adopter characteristics based on innovativeness shown in figure 4.2 does not show a bell-shaped distribution like the one portrayed by Rogers (1995) theory where innovators, early adopters, early majority, late majority and laggards are 2.5%, 13.5%, 34%, 34% and 16% of the population respectively. Instead, they took the form of 27.22%, 25.32%, 36%, 3.16% and 6.01% of the KRA population respectively. Also, innovators are higher in number than the early adopters. This does not follow Rogers (1995) theoretical assumption that innovators are the smallest in number within any social system and does not take into account members of the social system who are not sure which adopter categorization they fall. Nevertheless, it is consistent with Rogers DOI theory of the early majority who are 36% of the KRA staff population which is the highest number in the population.

5.2.2 Determining critical success factors for Adoption of innovations

The second study objective sought to answer the research question, *"What are the critical success factors for adoption of technological innovations in tax administration?"*

The overall result of this objective shows that out of the internal and external factors under investigation, only nine factors were identified as CSFs for adoption of technological innovations at KRA i.e. complexity, compatibility, triability, observability, adopter characteristics, corporate governance, communication channels, benchmarking and corruption. The other five factors: Relative advantage, manager characteristics, threat to privacy, incentives and external pressures were not statistically significant hence not identified as CSF for adoption of new technologies within the KRA context. Further analysis shows that complexity, observability, corporate governance and corruption should be observed closely. The factors are discussed below.

Complexity: The simplest systems to use were KRA Hub and Simba System ranked by most at 1, followed by iTax and KRA Website in that order. The most complex systems were ACHIEVE, iNNovate and Ejuris. For comparability of systems with a higher count, ACHIEVE was most complex

system whereas for systems with a lower respondent count, iNNovate was most complex. Complexity was found to have a large negative correlation with adoption and a statistically significant influence on adoption at KRA. These findings support Rogers (1995), Kamal (2006) and Respati (2020) on complexity or perceived ease of use as an important factor for adoption by members of a social system. We therefore, conclude that complexity is a CSF for adoption of technological innovations at KRA.

Compatibility: Staff perceived that the systems that adequately compatible with staff job needs were KRA Hub and iTax respectively whereas the least compatible were ACHIEVE and iConnect. Interestingly, majority were not sure whether Simba System and KRA Website addressed their job needs or not. Compatibility was found to have a moderate positive correlation with adoption and a statistically significant influence on adoption at KRA. This result support findings by Rogers (1995) and Kamal (2006) and Birru (2022) findings that compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption. We therefore, conclude that compatibility is a CSF for adoption of technological innovations at KRA.

Triability: Staff perceived that all the 15 KRA systems under investigation do not allow them to use the system on a trial basis only. Systems can only be used at full mode and not on a trial basis. Triability was found to have a moderate positive correlation with adoption and a statistically significant influence on adoption at KRA. These findings support Rogers (1995) and Kamal (2006) findings that triability of an innovation, is positively related to its rate of adoption. We therefore, conclude that triability is a CSF for adoption of technological innovations at KRA. KRA can develop system provisions that Allows usage on a trial basis and feedback incorporated before launch.

Observability: KRA Hub, iTax and KRA Website had the most observable benefits with the highest number of promoters whereas iConnect, QMS and ACHIEVE had the least observable benefits to staff respectively with ACHIEVE having the highest number of detractors. Observability was found to have a weak positive correlation with adoption and a statistically significant influence on adoption at KRA. These findings support Rogers (1995) theory that observability of a system is positively related to its rate of adoption. We conclude that observability is a CSF for for adoption of technological innovations at KRA.

Relative Advantage: From the findings, KRA Hub, iNNovate, iTAx and Simba Systems have the highest level of relative advantage compared to the previous systems respectively. Whereas iConnect had the lowest level of relative advantage compared to the previous systems. Staff generally perceived new systems as being much better than the manual or digitalised solutions they were replacing. Relative advantage had a very little positive correlation with adoption and no statistically significant influence on adoption. These study findings disprove Roger's (1995) theory and Kamal's (2006) study that

relative advantage is a key factor for adoption of IT in PSOs. We therefore, conclude that relative advantage is not a CSF for adoption of technological innovations at KRA.

Adopter characteristics: Findings showed that champions play a significant role in promoting adoption of new systems at KRA supporting studies by Frambach, 1993; Troshani & Doolin, 2005; Damanpour & Wischnevsky, 2006; and Kamal, 2006. In addition, 27.2% perceived themselves as innovators, 25.32% as early adopters, 36.1% as early majority, 3.16% as late majority and 6.01% as laggards. Only 2.22% of respondents stated that they are not sure about which adopter category they fall in. Findings show that the distribution of these adopter characteristics does not take the typical bell-shaped distribution postulated under Rogers (2003) theory of DOI where innovators, early adopters, early majority, late majority and laggards are 2.5%, 13.5%, 34%, 34% and 16% of the population respectively. The DOI theory also does not take into consideration those who are not sure where they fall. Inferential results show that adopter characteristics were found to have a small positive correlation with adoption and a statistically significant influence on adoption at KRA. This supports Damanpour and Wischnevsky (2006) and Kamal (2006) who show that when target users exhibit high adopter characteristics the higher the chances of adopting the new systems. We therefore, conclude that adopter characteristics is a CSF for adoption of technological innovations at KRA.

Findings from descriptive analysis shows that job-related skills and knowledge, professionalism, creativity are the key managerial traits that can influence staff under their supervision to adopt new systems. Gender and political orientation was found to have little influence on adoption. The implication is that if KRA wants to enhance innovation, it needs to ensure correct job placement of competent staff as supervisors. Other manager characteristics that can influence adoption as suggested by respondents included: attitude towards work, supportiveness, integrity, proactiveness, interpersonal skills and their ability to offer guidance. From the findings in the inferential analysis, manager characteristics was found to have a very small positive correlation with adoption and no statistically significant influence on adoption at KRA. These findings contradict findings by Damanpour and Schneider (2008) which demonstrated a relationship between manager characteristics and adoption of innovation in public organisations. We therefore, conclude that manager characteristics is not a CSF for adoption of technological innovations at KRA.

Threat to privacy: From descriptive analysis, systems vulnerability to hacking showed the highest perceived risk to staff with the most negative influence on adoption. Followed closely by exposure of personal information to external parties, confidentiality breaches and exposure of personal information to other staff respectively. KRA should promote confidentiality and data safeguards internal policies to give comfort to staff when urging them to use new systems. Other privacy concerns cited by staff included system unreliability and use of systems for staff victimisation as having a negative influence

on system adoption. From the inferential analysis, threat to privacy was found to have a very small negative correlation with adoption and no statistically significant influence on adoption at KRA. These findings refute findings by Troshani and Doolin (2005), Potts and Kastle (2010), Tjen et al (2019) and Birru (2022) who argue that privacy is a major concern for potential adopters. We therefore, conclude that threat to privacy is not a CSF for adoption of technological innovations at KRA. However, perceived risk has potential to impact adoption hence needs to be looked into through further studies.

Corporate governance: From descriptive analysis findings, a large proportion of staff believe that KRA has good governance policies for innovation management and senior management regularly reports to staff on technological innovations' performance. Majority also perceive that internal innovation policies are reviewed regularly after 1 to 2 years. From inferential analysis findings, corporate governance was found to have a small positive correlation with adoption and a statistically significant influence on adoption at KRA. We can therefore, conclude that corporate governance is a CSF for adoption of technological innovations at KRA.

Incentives: From descriptive analysis, majority of respondents agreed that receiving a positive incentive would influence their use of new systems implemented in KRA. It can be observed that staff can be positively motivated to adopt new systems implemented by KRA. However, from the inferential analysis findings, incentives were found to have a very small positive correlation with adoption and no statistically significant influence on adoption at KRA. This surprisingly implies that incentives may actually not have much influence on adoption in the context of tax administration contradicting Rogers (1995) DOI theory, Baskaran et al's (2020) and Mbeche (2017) that concluded that motivation is a significant factor that influences technology adoption. It however, support Potts and Kastle (2010) findings that public officials can be rewarded for doing the bare minimum and nothing more, so incentives will not have much influence on them. We can therefore, conclude that incentives are not a CSF for adoption of technological innovations at KRA. REspati (2020) recommends need for further research on incentive effects.

Communication channels: From descriptive analysis findings, email is the most effective channel for communicating of a new technological system to KRA staff, followed by trainings, intranet, internal memos and newsletters respectively. Therefore, from the findings, it can be observed that for KRA to effectively publicise any new system and ensure good staff reach, the preferred communication channels would be emails. Also one of the systems under study i.e., KRAHub, which is also highly ranked by staff in various aspects, is an effective communication channel. From the inferential analysis findings, and in line with Rogers (1995) theory of DOI, the communication channel was found to have a small positive correlation with adoption and statistically significant influence on adoption at KRA. It is evident that KRA has been successful in creating awareness about new systems. Though staff have

not interacted with all the systems, they are aware of their existence which is critical for triggering the diffusion decision process. These findings support Rogers (1995) theory on communication channels and its positive influence on adoption. We can therefore, conclude that using effective communication channels is a CSF for adoption of technological innovations at KRA.

External pressures: From descriptive analysis findings, majority of respondents agreed that external pressures e.g. government, media (social media, print media and mass media), external networks, industry associations and other publics, can influence the use of new systems implemented in KRA. Hence, it can be observed that when external pressures are exerted on staff to use systems, they tend to use the systems. However, from the inferential analysis findings, external pressures were found to have a very small positive correlation with adoption and no statistically significant influence on adoption at KRA. To some extent, these findings are in line with other studies that show a positive relationship between external forces and innovation adoption (Troshani & Doolin, 2005; Potts & Kastle, 2010) with respect to the direction of the relationship, but disputes them to the extent that it is a significant predictor of innovation adoption. We therefore, conclude that external pressure is not a CSF for adoption of technological innovations at KRA.

Benchmarking: From descriptive analysis findings, staff perceive that benchmarking activities like efforts or visits (either physically or electronically) made by KRA to other tax administrations or private organisations that have excelled in implementing a system, can influence their use of a similar system implemented in KRA. From the inferential analysis, it was found that benchmarking has a small positive correlation with adoption and a statistically significant influence on adoption at KRA. Benchmarking can predict staff's decision to adopt a new system. These findings are in line with the findings by Potts and Kastle (2010). We therefore, conclude that benchmarking is a CSF for adoption of technological innovations at KRA. If KRA carries out benchmarking activities with other tax agencies or private organisations with similar systems prior to implementation, this can significantly and positively influence the adoption of these systems by KRA staff.

Corruption: From descriptive analysis findings, majority of respondents were of the opinion that corruption may or may not influence the decision to use or not use a new system. Implying that a good number of respondents both agreed or disagreed that it influences adoption. The inferential analysis brings more clarity on this as it was found that corruption has a small negative correlation with adoption and a very statistically significant influence on adoption of systems by KRA staff. These findings are in line with others studies that show that corrupt officials can be hesitant to adopt new technology because it is likely to close corruption loopholes, reduce human discretion and increase transparency (Jenkins, 1996; Bird and Zolt, 2008). We therefore, conclude that corruption is a CSF for adoption of technological innovations at KRA.

5.2.3 Evaluating influence of Adoption on staff performance

The third study objective sought to answer the research question, *“To what extent does adoption of technological innovation influence staff work performance at KRA?”*

From descriptive analysis findings, majority of respondents agree that KRA Hub, iTax, Simba System and iCMS respectively have significantly improved their work performance and productivity. The highest proportion of respondents thought that ACHIEVE and iConnect have not improved their work performance or productivity. On a ranking scale, respondents ranked iTax, Simba System, KRAHub and iCMS respectively as the best systems in improving staff performance and productivity. These were followed by KRA Website and iKNow. Ejuris and ACHIEVE systems were ranked lowest respectively in terms of their capabilities in improving staff performance. From inferential analysis findings, adoption of technological innovations was found to have a moderate positive association with staff performance and adoption was found to have a statistically significant influence on staff performance, implying that any increase in the adoption of new systems by KRA staff will positively result in improved work performance or staff productivity at KRA. These results support Al-Nashmi and Amer (2014) study which concluded that when IT adoption is high, staff work performance and subsequently organisational productivity will positively improve. From this we can conclude that adoption of technological innovations positively increases staff work performance by an index of 0.5212. To this extent, adoption of technological innovation significantly influences staff work performance at KRA.

5.2.4 Evaluating influence of adoption on revenue collection

The fourth study objective sought to answer the research question, *“To what extent does adoption of technological innovations influence revenue collection at KRA?”*

From the descriptive analysis findings, majority of respondents were in agreement that iTax, Simba System and iCMS respectively, have led to an increase in revenue collection. Since these three systems are revenue collection systems, we can observe that they have directly helped increase revenue collection at KRA. Majority of the respondents were of the opinion that non-revenue systems such as iWhistle, Ejuris and KRA Hub, in that order, have indirectly helped to increase revenue through whistleblowing on tax evasion schemes and alternative tax dispute resolution under Ejuris. KRAHub provides daily updates on information that can aid revenue officers in carrying out their day-to-day responsibilities. Majority of respondents were of the opinion that ACHIEVE and EIMS have not

contributed to increased revenue. 91.14% of the respondents were of the opinion that the use of new technological systems had contributed significantly to increased revenue collection possibly through the transition from manual mechanisms to automation, reduced officer discretion, transparency, efficiency and effectiveness. From inferential analysis findings, adoption was found to have a moderate positive association with revenue collection and an almost perfect statistically significant influence on revenue collection, implying that any increase in the adoption of new systems by KRA staff will positively result in increased revenue collection at KRA.

These findings are consistent with Wawira et al (2017), Gitaru (2017) and Owino et al (2017) studies that concluded a strong and almost perfect association between technological adoption and revenue collection, but refutes Ofurum et al's (2017) study that concluded that adoption on e-tax had a negative influence on revenue collection. From this we can conclude that adoption of technological innovations positively increases revenue collection. To this extent adoption of technological innovations positive and significantly influences revenue collection at KRA.

5.3 Conclusions

The findings on objective one (1) show that from the assessment conducted in the study there is a relatively high system awareness rate at KRA at 91.08%. Some systems are widely accepted whereas some are not. The average system adoption rate at KRA was found to be below average at 45% consistent with staff perception that KRA has an estimated adoption rate of above 26%. The study concludes that staff at KRA perceive that there is a high adoption rate of new technologies implemented by the Authority. And though staff have not interacted with all the systems under investigation, they are aware that the systems exist with a noteworthy awareness rate of 100% for the iTax revenue collection system. We observe that KRA has been successful in creating awareness on innovative technological solutions.

The findings on objective two (2) show that out of the 14 critical success factors under investigation, only nine (9) factors were identified as Critical Success Factors (CSFs) for adoption of technological innovations at KRA. These are: complexity, compatibility, triability, observability, adopter characteristics, good corporate governance, communication channels, benchmarking and corruption. All these nine factors have a statistically significant influence on system adoption. The other five (5) factors i.e., relative advantage, manager characteristics, threat to privacy, incentives and external pressures are not critical factors as they do not have a statistically significantly influence on adoption of new technologies at KRA. Further, Complexity, observability, corporate governance and corruption should be treated as key predictors of innovation adoption as they can have adverse effects on adoption if ignored. When a system is simple to use, staff can clearly see its benefits to their job, and leadership

foster good innovation management of the system, it will generally be adopted more rapidly. Also, if the targeted staff are involved in corrupt activities, the said system is likely to be adopted less rapidly. If the effective communication channels highlighted in this study are used when creating awareness about the new system, it will generally be adopted more rapidly.

Something interesting that came out of the study was that ACHIEVE system which was ranked as the most complex system was also the same system with the highest awareness and adoption rate. Which begs the question whether complexity really affects adoption of technological innovations in a tax administration setting. In this regard, though a system may come across as complex to the user, or has negative influence, it can still be diffused rapidly by the targeted users. Greve (2011) refers to this phenomenon as adoption of a disappointing innovation where the innovation's value is below expectations, but target users adopt the system anyway due to a number of reasons. Another surprising result is that incentives do not affect adoption of technological systems in KRA. According to Rogers (1995) theory, incentives, both negative and positive can have a high influence on adoption of something new. In the context of KRA, this is not the case. And from the descriptive analysis staff highlighted that adoption is mandatory and hence are not given much choice on whether to use the system or not.

The findings on objective three (3) show that from the evaluation conducted in the study, adoption of technological innovations has a positive and a statistically significant influence on staff performance at KRA. The study concludes that increased adoption of new technological systems positively and significantly influences job performance of KRA staff.

The findings on objective four (4) show that from the evaluation conducted in the study, adoption of technological innovations has a positive and a statistically significant influence on revenue collection at KRA. The study concludes that DOI positively and significantly influences revenue collection at KRA. The implications of not monitoring critical predictors like complexity, observability, good governance or corruption can lead to adverse effects on adoption by staff and lead to poor uninformed decisions about resource allocation and implementation of technologies which do not add value or have duplicate functionality.

5.4 Study Contributions

This study provides incremental understandings on the body of knowledge on innovation adoption in the public sector, specifically in the context of tax administration on the aspect of rewards and incentives influence on innovation adoption. Those incentives, whether positive or negative, are not a significant predictor of innovation adoption in the context of tax administration. Also, with particular reference to

the ACHIEVE performance management system implemented in KRA, we see that though the system is ranked by staff as the most complex, it is also one of the systems with the highest awareness rate and adoption rate among the 15 systems under investigation. This indicates that a complex and unpopular innovation can actually still be rapidly adopted by members of a social system within the context of public sector. The policy and research implication is the need to acknowledge that complexity of a system may not deter staff from using a system even if it is having negative influence on their work performance or productivity.

5.5 Recommendations

This section highlights the recommendations of this study from the discussions in in chapter 5 above.

For KRA, recommendations of the study include:

1. KRA should continue investing in system enhancements with a strategic focus, is to ensure that the technological solutions areas simple and user-friendly as possible, put in place strategies to ensure systems address job needs and provide value for staff and put in place measures to curb corruption.
2. KRA should continue carrying out internal communication campaigns to create awareness on system upgrades or launch of new innovative systems and recommends use of the effective communication channels highlighted in this study i.e., emails, training, memos and newsletters, to create awareness about newly launched systems, but with a more targeted approach.
3. Conduct a survey to unearth why iConnect and Ejuris are not widely accepted by KRA staff and have sensitisations and trainings targeted for these specific systems to increase acceptance.
4. Having a structured documentation and periodic reporting of system-generated adoption rates to facilitate evidence-based decision making on the performance of technological innovations implemented at KRA. Documentation and periodic evaluation of adoption rates will ensure that data is made available for conducting more data-driven innovation research.
5. KRA should halt implementation of ACHIEVE and conduct a re-evaluation of its implementation, identify areas of improvement through obtaining feedback from staff, incorporate this feedback and re-launch the system. This information can be used to inform decision making on how the system can be revamped and re-launched.
6. Conduct survey to identify system privacy concerns and develop and communicate a comprehensive corporate confidentiality and data security safeguards internal policy.
7. KRA can conduct a survey to establish incentives that can both inhibit or enable adoption by staff and further implement those incentives which have been highlighted in this study that can be good to motivate adoption.

5.6 Study Limitations

The following were identified as study limitations:

1. Hesitation by KRA staff to complete survey questionnaires conclusively because of its length..
2. Limited access to KRA staff as a result of the Covid 19 pandemic restrictions instituted by the Government of Kenya for public institutions.
3. Limited financial resources to perform the research.
4. Time constraints.
5. Lengthy process of approval to access data.
6. The study variables were many, causing the analysis to take a while and the content of the paper long.

5.8 Suggested Areas for further research

1. In-depth focused research on perceived threat to privacy with regards to innovation adoption as Potts and Kastle (2010) highlights how perceived threat to privacy may be a major yet much less researched constraint on adoption of innovation technologies in public sector.
2. Post-adoption research to investigate whether the system meets the expectations of users or it is what Greve (2011) calls “a disappointing innovation” which does not meet up to the expectations of the users. Evaluate the behaviour of tax administration staff post-adoption of these new technologies.
3. Conduct cross-national or comparative studies with other tax administrations in Africa to show to what extent factors are generalisable and establish differences in national culture or corporate governance traditions in the context of tax administration.
4. Causal research can be carried out using system-generated data to further validate the causal relationship between these factors (complexity, observability, triability, compatibility and relative advantage in relation to adoption of innovation). Potts and Kastle (2010) concluded that empirical work has been hard and there is still very little attempt at empirical innovation studies in public sector.
5. Investigate factors that have not been tackled by this study, but are captured in the literature review like external factors identified by Troshani and Doolin (2005) e.g., perceived cost, culture and legal issues.
6. Administer a similar study with KRA Board members. With reference to corporate governance, as noted by Lopez (2018) et al. there is little research literature on board member influence on innovation, further research can focus on the influence of KRA Board of Directors on innovation implementation at KRA.

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APPENDICES

Appendix 1: Introduction Letter (from SBS)

Ole Sangale Rd, Madaraka Estate,
P.O Box 59857 00200, Nairobi, Kenya.
Cell: +254 703 414/6/7, Twitter: @SBSKenya
Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu



27th July 2021

Director General,
National Commission for Science Technology and Innovation,
P. O. Box 30623, 00100
Nairobi.

Dear Sir,

RE: FACILITATION OF RESEARCH –MAK'OSEWE FLORENCE ANYANGO

This is to introduce Mak'Osewe Florence Anyango who is a Master's in Public Policy Management (MPPM) Student at Strathmore University Business School, admission number MPPM/100906/17. As part of our MPPM Program, Florence is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MPPM course.

Florence is undertaking a research paper on "**Evaluating Factors Affecting Diffusion of Technological Innovations at Kenya Revenue Authority**" The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MPPM seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Caroline Tiara".

Caroline Tiara.
Manager - Graduate Programmes.



Appendix 2: Email to Respondents

From: **Florence Mak'Osewe** <florence.makosewe@strathmore.edu>
Date: Mon, Dec 20, 2021 at 5:28 PM
Subject: Request to Participate in Research to Evaluate Use of Technological Innovations in KRA
To: Respondent

Good Morning / Afternoon to you,

Trust you are keeping well.
My name is Florence Mak'Osewe, a staff member at KRA. I am currently pursuing a Master in Public Policy at Strathmore Business School. Pursuant to my Master's degree, I am working on a research project to evaluate the factors influencing use or adoption of various technological systems implemented within KRA.

You are receiving this email as I have randomly selected you to complete the online survey. The online survey will take 15 – 20 minutes of your time. I am aware that the survey may be relatively long, but only with your contribution I believe that this research can give valuable insights into factors influencing why staff use or do not use technological solutions and ultimately inform decision-making on implementation of new technologies within KRA.

I therefore, humbly request that you participate and complete the survey until the very end. To access the questionnaire, please click the survey link below:

https://uzhwwf.qualtrics.com/jfe/form/SV_bEfooEXKOYAH2Wq

If you have any questions or clarifications about the research or the methodology or if you would like to request a soft copy of the final thesis, please email me at florence.makosewe@strathmore.edu or florence.makosewe@kra.go.ke.

I appreciate your contribution!

Regards
F. Mak'Osewe

Appendix 3: Follow-up Email to Respondents

To: Respondent
From: "Florence Mak'Osewe" <florence.makosewe@strathmore.edu>
Date: 02/02/2022 07:31
Subject: Request to Participate in Research to Evaluate Use of Technological Innovations in
KRA - Reminder

Good morning/ Afternoon,
Trust you are well. And Happy New Year.

The mail thread below refers.

I recently sent you an invite requesting you to populate my Masters survey through the link: https://uzhwwf.qualtrics.com/jfe/form/SV_bEFooEXKOH2Wq to evaluate adoption of technological innovations in KRA.

The survey will take 15-20 minutes to complete. I'm humbly requesting that you set aside some time on your schedule to complete the survey.

Your response matters and will give valuable insights into technological adoption within the Authority.

Please ignore the email if you have already completed the survey.

For any queries, you can contact me on florence.makosewe@strathmore.edu or florence.makosewe@kra.go.ke.

Thank you.

Regards,

FlorenceMak'Osewe

Appendix 4: Consent Letter / Consent Form

Section I: CONSENT FORM

In conformance with ethical and data protection regulations of Strathmore Business School, as a respondent, you are required to agree to participate by accepting the consent statement below. Please note, there are no inherent risks to you for participating or declining to participate in the survey and no direct benefits will be provided to you as a respondent, but the final paper can be shared on request via email.

I have understood the purpose of the study as explained above by the researcher. I have understood all that I have read and had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage of the research. (*Select I have understood to proceed*).

- I HAVE understood and agree to participate in the research project
- I HAVE NOT understood and will not participate in the research project

Storage of information on completed questionnaire. The data from the questionnaire may be used for future data analysis.

- I AGREE to have my completed questionnaire stored for future data analysis
- I DO NOT AGREE to have my completed questionnaire store for future data analysis

Appendix 5: List of Participating Organisations

Kenya Revenue Authority



Appendix 6: Strathmore University Ethics Review Letter



22nd July 2021

Ms Mak'Osewe, Florence
flojomak@gmail.com

Dear Ms Mak'Osewe,

RE: Evaluating Factors Affecting Diffusion of Technological Innovations at Kenya Revenue Authority

This is to inform you that SU-IERC has reviewed and **approved** your above **master's** research proposal. Your application reference number is **SU-IERC1069/21**. The approval period is **22nd July 2021 to 21st July 2022**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

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

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC



Cc: Prof Fred Were, Chairperson; SU-IERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

Appendix 7: NACOSTI Research Permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 984673	Date of Issue: 09/August/2021
RESEARCH LICENSE	
	
This is to Certify that Ms.. Florence Anyango Mak'Osewe of Strathmore University, has been licensed to conduct research in Nairobi on the topic: EVALUATING FACTORS AFFECTING DIFFUSION OF TECHNOLOGICAL INNOVATIONS IN TAX ADMINISTRATION: LESSONS FROM KENYA REVENUE AUTHORITY for the period ending : 09/August/2022.	
License No: NACOSTI/P/21/12230	
984673 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code 
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	

Appendix 8: Questionnaire / Research Instrument

TECHNOLOGICAL INNOVATION ADOPTION SURVEY QUESTIONNAIRE FOR KRA STAFF

Notes to Respondent

Good morning/ Afternoon to you.

My name is Florence Mak'Osewe. I am a student at Strathmore Business School pursuing a Master's in Public Policy and Management and a staff of KRA. The purpose of this study is to evaluate adoption of technological innovations in tax administration with a focus on KRA. With your contribution, I expect to gain insights into factors influencing why staff use or do not use technological solutions. Please answer the questions in the questionnaire truly and to the best of your knowledge.

All information provided will be treated with confidentiality and anonymity and all answers will be analysed in totality for academic purposes only.

You are advised NOT to disclose any personal information in this questionnaire. This survey is voluntary and you are at liberty to opt out of the survey at will. Your participation is critical to the success of this survey, therefore, I kindly request your assistance in completing the survey until the very end.

The questionnaire contains 3 Sections:

Section I: Consent Form

Section II: Main Questionnaire

Section III: General Information

Duration of the Questionnaire: Approx. 15 - 20 Minutes of your time.

For questions about the survey, please email me at: florence.makosewe@strathmore.edu or florence.makosewe@kra.go.ke

I appreciate your contribution!

Section I: CONSENT FORM

QX: In conformance with ethical and data protection regulations of Strathmore Business School, as a respondent, you are required to agree to participate by accepting the consent statement below. Please note, there are no inherent risks to you for participating or declining to participate in the survey and no

direct benefits will be provided to you as a respondent, but the final paper can be shared on request via email.

I have understood the purpose of the study as explained above by the researcher. I have understood all that I have read and had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage of the research. *(Select I have understood to proceed)*

- I HAVE understood and agree to participate in the research project
- I HAVE NOT understood and will not participate in the research project

QX: Storage of information on completed questionnaire. The data from the questionnaire may be used for future data analysis.

- I AGREE to have my completed questionnaire stored for future data analysis
- I DO NOT AGREE to have my completed questionnaire store for future data analysis

Section II: MAIN QUESTIONNAIRE

1. To what extent are you aware and interacted with the following KRA systems before? (Select one option for each)

	Not used & not aware	Aware but not used	Used
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA Website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTAX	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCONNect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS - Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ACHIEVE

Ejuris

2. Rank the following systems from 1 to 15 according to their complexity. *Where 1 is the least complex and 15 is the most complex. (Drag the option up or down to its preferred position. Out of the 15 systems, this question has only displayed the systems you have interacted with.)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website															
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS - Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNOvate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. To what degree do you agree with the following statement?

The following system(s) adequately address my job needs *(Select one option for each system)*

	Not Sure	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	1	2	3	4	5	6
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website						
iTAX	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS - Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. On a scale of 0 to 10, (where 0 to 6= Highly Unlikely, 7 to 8=Neutral and 9 to 10= Highly likely)
How likely are you to recommend the following systems and its benefits to a friend or colleague?

	Highly unlikely 0 - 6	Neutral 7 - 8	Highly likely 9 - 10
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA Website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS – Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. To what degree do you agree with the following statement?

The following system allows me to use it on a trial basis only. *(Select one option for each system)*

	Not Sure	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	1	2	3	4	5	6
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA Website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTAX	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS - Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. To what degree do you agree with the following statement?

System champions (staff who advocate for a system) play a big role in promoting the use or adoption of new systems by KRA staff. *(Select one)*

Not Sure	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

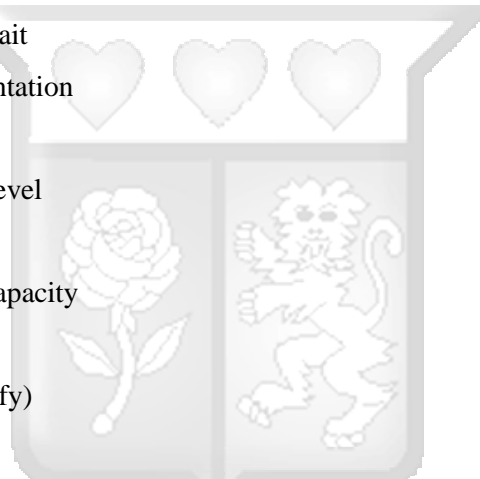
7. Where would you group yourself in terms of using / adopting new technologies implemented within the Authority? *(Select one)*

- Innovators – I strive to first innovate or to try out new systems immediately
- Early adopters – I start using systems earlier for reputation / status concerns

- Early majority – I start using systems much later only for their practical benefits
- Late majority – I start using systems much later from word-of-mouth, but cautiously
- Laggard – I start using systems only when mandatory or because everyone else is using it
- Not sure

8. The following manager's / supervisor's characteristics can influence my adoption / use of a new system within the Authority. *(Select all options that apply)*

- Their job-related knowledge and skills
- Their professionalism
- Their age group
- Their personality trait
- Their political orientation
- Their gender
- Their educational level
- Their creativity
- Their intellectual capacity
- None
- Other (Please specify)



9. Which of the following privacy concern(s) would have the most negative influence on the use of a new system in KRA? *(Select all options that apply)*

- Exposure of my personal information to other staff
- Loss of personal information
- Monitoring of surveillance of my online activities
- Eavesdropping online
- System vulnerable to hacking
- Confidentiality breaches
- Exposure of my personal information to external parties
- I have no privacy concerns
- Other (Please specify)

10. To what degree do you agree with the following statement?

The Authority conducts regular technological innovations audits and management regularly reports to staff on technological innovation performance. *(Select one)*

Not Sure	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. How often, in your opinion, are KRA’s innovation policies and strategies reviewed? *(Select one)*

- 0 – 12 months
- 13 – 24 months
- 25 – 48 months
- 49 months or more

12. Receiving a positive incentive would influence the use of a new system implemented in KRA *(Select one)*

Not Sure	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Briefly comment on incentive(s) that would be good to receive to influence use of new technological systems *(If no comment(s) please indicate N/A)*

13. In your opinion, which of the following internal communication channels is most effective for communicating a new technological system to KRA staff? *(Select all options that apply)*

- Email
- Intranet / KRA Hub
- Internal memos
- Through a colleague
- Official KRA Website

- Information Hub / Knowledge management platform
- Social media channels
- Through system champions
- Through training
- Managers cascade to staff under their supervision
- Other (Please specify)

14. To what degree do you agree with the following statement?

External pressures, external associations, political factors or networks can / do influence use of a new internal system at KRA. *(Select one)*

Not Sure	Disagree	Somewhat	Neutral	Somewhat	Agree
		Disagree		Agree	
1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. To what degree do you agree with the following statement?

Benchmarking activities can / do influence staff to use or adopt new technologies within KRA. *(Select one)*

Not Sure	Disagree	Somewhat	Neutral	Somewhat	Agree
		Disagree		Agree	
1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. To what degree do you agree with the following statement?

Corruption can / has caused staff to be reluctant to use new technologies within KRA. *(Select one)*

Not Sure	Disagree	Somewhat	Neutral	Somewhat	Agree
		Disagree		Agree	
1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. To what degree do you agree with the following statement?

The following systems are widely used or accepted by KRA Staff. *(Select one option for each system)*

	Not Sure	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	1	2	3	4	5	6
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website						
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTAX	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS - Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Estimate the approximate rate at which staff adopt or start using a new system implemented within KRA. (Select one)

- 0 – 5%
- 6% - 10%
- 11% - 15%
- 16% - 20%
- 21% - 25%
- 26% and above

19. To what degree do you agree with the following statement?

The following system has significantly improved my work performance and productivity. (Select one option for each system)

	Not Sure	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	1	2	3	4	5	6
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website						
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTAX	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS - Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Rank the following systems from 1 to 15 according to how it has / can improve staff work performance. Where 1 is the highest ranked and 15 is the lowest ranked. (Drag the option up or down to its preferred position. Out of 15 systems, this question has only displayed the systems you have interacted with.)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website															
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS – Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. To what degree do you agree with the following statement?

The following system(s) can / has increased revenue collection directly or indirectly. *(Select all system options that apply)*

	Not Sure	Disagree	Somewhat	Neutral	Somewhat	Agree
	1	2	3	4	5	6
Simba System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New KRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website						
iKNow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iTAX	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iConnect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCARE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iNNovate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team Central	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
QMS - Qpulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KRA Hub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ACHIEVE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iCMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iWhistle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ejuris	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Has the use of new technological systems contributed to increased revenue collection at KRA?

No	Maybe	Yes
1	2	3
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. Please propose a new innovative revenue collection system that has NOT been adopted by KRA, but has been implemented by other Tax Administrations. *(If no response, select Not Applicable)*

-
- Not applicable

Section III: GENERAL INFORMATION

24. Which Department/ Division are you based in? (Select one from dropdown arrow)

- Commissioner General's or Transformation Leadership Office
- County Revenue Division
- Domestic Taxes Department
- Intelligence & Strategic Operations Department
- Internal Audit
- Investigation & Enforcement
- Kenya School of Revenue Administration
- Corporate Support Services Department
- Strategy, Innovation & Risk Management Department
- Legal Services & Board Coordination Department
- Marketing & Communication
- Supply Chain Management

25. Please select which KRA station / office you are based in (Select one)

- Times Tower – Head Office
- Container Freight Stations (CFSs)
- Taxpayer Service Offices (TSOs)
- Sameer Business Park
- Mombasa Longroom
- Border Stations / One-Stop-Border-Posts (OSBPs)
- Airports / Ports (Kilindini and Lamu)
- Export Processing Zones / Customs Bonded Warehouses
- KESRA Centres

- Fortis, Ushuru Pension Plaza (UPP)
- Corporate Business Centre (CBC), Upper Hill
- Other (Please specify)

26. What is your gender? (*Select one*)

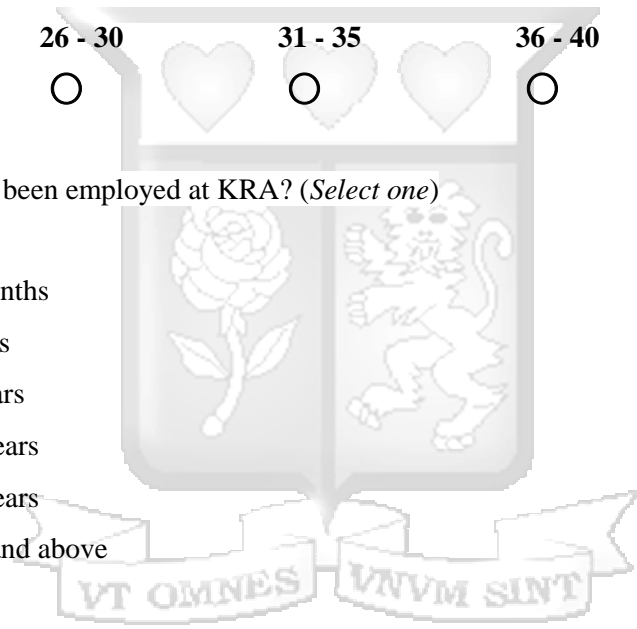
- Male
- Female
- Prefer not to say

27. What age bracket are you? (*Select one*)

- | | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|
| 18 - 25 | 26 - 30 | 31 - 35 | 36 - 40 | 41 Years or more |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

28. How long have you been employed at KRA? (*Select one*)

- 0 – 11 months
- 1 – 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 19 years
- 20 years and above



29. What is your designation / Management level? (*Select one*)

- Board Level
- Senior management level
- Middle management level
- Supervisory / Lower-level management
- Junior level staff
- Other (Please specify)

30. What is your highest level of education? (*Select one*)

- Primary / elementary school

- Secondary / High school / Junior high school
- Certificate / Diploma
- Bachelors / Undergraduate degree
- Masters / postgraduate degree
- Doctorate
- Other (Please specify)

Thank you for your time spent taking the survey.

End of Survey.

