

**EFFECT OF REFORMS IN CUSTOMS ADMINISTRATION SYSTEM ON
TRADE FACILITATION IN KENYA**

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TRADE FACILITATION IN KENYA**

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TECHNOLOGY.**

2018

DECLARATION

This research project is my original work and has not been presented for a post graduate diploma in any other academic institution

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ABSTRACT

Customs administrations today face a variety of political and administrative pressures and challenges. These include fluctuating workloads with static or declining resources, greater business expectations, and continuing pressures to meet often-conflicting government revenue, trade facilitation, social protection, and national security objectives. To cope with these pressures and challenges, the international customs community looks to the applied use of information technology (IT) as a catalyst for improving organizational and operational efficiency and effectiveness. The general objective of this research was to establish the effect of reforms in custom administration system integrity, efficiency and governance on trade facilitation in Kenya. The specific objectives were to determine the effect of reforms in integrity of ICT infrastructure, improvements in efficiency of ICT service delivery and ICT governance reforms on trade facilitation in Kenya. This study was a descriptive cross-sectional survey. This study was carried out in Nairobi. The study involved 492 employees in the Customs Services Department of KRA at KRA headquarters in Times Towers, Nairobi. The sampling frame that was applied in this study was a list of employees in the Customs Services Department of KRA. This study employed stratified sampling technique to select the study participants. Questionnaire was utilized as data collection instrument in the current study. Analysis was through both descriptive and regression statistics. Presentation of results for both the descriptive and inferential statistics was through tables, pie-charts and graphs. Study results indicate that reforms in ICT integrity had significantly and positively affected trade facilitation ($\beta = 0.540$; $t = 4.714$; $p < 0.05$). Further, findings showed that reforms in efficiency of ICT service delivery positively and significantly influenced trade facilitation ($\beta = 0.385$; $t = 2.550$; $p < 0.05$). Additionally, study findings revealed that reforms in ICT governance at KRA had a significant and positive effect on trade facilitation ($\beta = 0.174$; $t = 2.096$; $p < 0.05$). From the study findings, the following recommendations are made. First, Customs initiatives, such as deferred payment of revenues, clearance on minimum information, periodic goods declarations, tariff-free policies and duty-free imports, and so on have to be carefully reviewed and integrated with any new legislation and systems upgrade. Secondly, any modernization of the customs systems should encompass the alignment of Customs procedures and documents with international standards, conventions and other instruments. Lastly, the introduction of Customs Automation by KRA should ensure that the systems it adopts are compatible with what other governmental departments and private sector stakeholders, whose activities involve Customs operations have.

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ACRONYMS

EAC	East African Community
ICF	International Customs Federation
ICMS	Integrated Customs Management System
ICT	Information and Communications Technology
IERM	Information Enterprise Risk Management
IGS	Intelligence Gathering System
IS	Information System
ISA	Information System Audit
ISS	Information Security Standards
IT	Information Technology
ITSM	IT Service Management
KEBS	Kenya Bureau of Standards
KEPHIS	Kenya Plant Health Inspectorate Services
KESRA	Kenya School of Revenue Administration
KPA	Kenya Ports Authority
KRA	Kenya Revenue Authority
OSBP	One Stop Border Posts
PHS	Port Health Services
RARMP	Revenue Administration Reform and Modernization Program
RECTS	Regional Electronic Cargo Tracking System
SLA	Service Level Agreement
SSC	Single-Sign-On Capability
STP	Simba Transformation Project
TAM	Technology Acceptance Model
TMS	Tax Management System
USB	Universal Serial Bus
USBS	USB usage and security
WCO	World Customs Organization

DEFINITION OF TERMS

ICT governance - The system by which the current and future use of ICT is directed and controlled. It involves evaluating and directing the plans for the use of ICT to support the organization and monitoring this use to achieve plans. It includes the strategy and policies for using ICT within an organization (Armstrong & Sambamurthy, 2014).

ICT integrity – the methods of ensuring that data is real, accurate and safeguarded from unauthorized user modification (Mpumela, 2015).

Trade facilitation – reducing associated cost burdens and maximizing efficiency in trade while safeguarding legitimate regulatory objectives (ICF, 2014).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Customs administrations today face a variety of political and administrative pressures and challenges. These include fluctuating workloads with static or declining resources, greater business expectations, and continuing pressures to meet often-conflicting government revenue, trade facilitation, social protection, and national security objectives. Moreover, customs administrations are increasingly required to integrate their systems and procedures with the sophisticated global logistics networks used by international trade and transport operators.

To cope with these pressures and challenges, the international customs community looks to the applied use of information technology (IT) as a catalyst for improving organizational and operational efficiency and effectiveness (Wulf & Sokol, 2014). As a result, many modernization programs in the customs sector over the last decade have incorporated significant computerization components. Many customs administrations today use varying degrees of automation to support core customs functions such as goods declaration processing, revenue assessment, revenue collection, risk management, and management reporting.

All countries in the world have Customs Administrations. In some countries, these Customs Administrations are independent whereas in other countries, Customs functions are integrated in other government departments like security, home affairs, immigration,

and revenue authorities (Chimilila, Sabuni & Benjamin, 2014). This is because the perceived role of Customs Administration differs between countries. Milner, Morrissey and Zgovu (2015) posit that in developed countries the role of Customs can be seen more of protection and trade facilitation while in developing countries like Kenya, where import taxes are important part of budgetary resources the role of customs has included revenue collection through imposition of various duties and taxes.

The role of Customs in trade facilitation has received significant attention in recent years due to the advances in globalization. Trade facilitation involves minimizing hurdles of doing trade between countries. Mpumela (2015) observes that there is need to for minimize the incidence and complexity of import and export formalities and to decrease and simplify import and export documentation requirement. This goes with modernizing and reforming the customs administration and putting in place efficient risk management strategies in order that facilitation does not impair other roles of the Customs through a simplified release and clearance of goods. Expedited release of goods includes minimization of release time and reduction of documentation. Modern business practices, such as just-in-time delivery systems and global supply chains, underscore the importance of timely, predictable delivery. Trade facilitation enhances countries' ability to compete in international markets by reducing shipping delays and risk, and lowering the cost of trading (Milner et al., 2015).

Compared to global best practices, Kenya requires large numbers of trade documents and inspections. Inspection issues include repeat inspections of products already certified by

accredited laboratories, inspections of products originating within the EAC and bearing the certification mark issued by a national standards bureau, and non-standardized testing procedures. The World Bank reported that clearance times in Kenya was seven times less predictable than for the best practice Country like Singapore (World Bank, 2016).

In 2012, the Government of Kenya committed to improve international trade facilitation in the country by reducing processing delays and lowering costs associated with the clearance of goods on Kenyan borders (ICF, 2014). It laid down plans to develop an electronic single window platform for submitting, receipting and processing documentation used in clearing trade-related cargo. The electronic single window is the sole entry point for lodging trade transaction documentation in Kenya. It is aimed at linking up key trade stakeholders such as the Kenya Revenue Authority (KRA), Kenya Ports Authority (KPA), Kenya Bureau of Standards (KEBS), Kenya Plant Health Inspectorate Services (KEPHIS) and Port Health Services (PHS) with clearing and freight forwarding agents and banks. This project was to be a part of the extensive reforms and modernization of Customs undertaken in the country to enhance trade facilitation not only in Kenya but also within the East Africa region. Other reforms include simplification of procedures, professionalizing Customs, and improvements on internal audit (ICF, 2014). This study will seek to assess the impact of the ICT based reforms on trade facilitation in Kenya.

1.1.1 ICT Based Custom Administration Reforms

Information and Communications technology (ICT) is assuming an increasingly

important role in Customs administration reforms (Wulf & Sokol, 2014). However, the priorities, expectations, experience, capabilities, and resources of individual Customs administrations vary considerably. Beginning in the early 1970s, customs administrations of many developed economies began to recognize the significant advantages of using technology-based solutions to improve their operational efficiency. They designed and developed their own customs computer systems, tailored to meet national needs. Over the years, such systems have been enhanced, simplified, and in some respects standardized in line with international best practices. They were adjusted over time to capitalize on changes in ICTs. As a result, such countries have computer systems that reflect modern customs management practices such as self assessment, clearance on minimum information, deferred payment of revenues, an intelligence-led and targeted risk management approach to clearance of international consignments, and sophisticated post-clearance audit regimes.

The historical experience with ICT of many developing and emerging economies has been quite different and not without significant difficulty and, in some cases, high financial cost. Lacking the necessary financial and human resources and access to a well-established domestic IT market, customs administrations of many developing countries have been slow to take advantage of the full potential offered by the appropriate application of modern technological advances. Fortunately, this situation has changed over recent decades, partly as a result of the commercial availability of customs-specific computer systems, and the international donor community that has stepped up support to strengthen customs administrations. Yet, the technological infrastructure and support

available in many developing countries lags far behind that which is available in more developed economies, and increasingly, behind the technology-intensive business practices of many international traders.

Moreover, when automated systems are introduced, they are often not used to their full potential. At times, the Customs Code requires the submission of paper documents for cargo clearance purposes, thereby duplicating information often provided to customs electronically. More frequently though, customs staff and management have been reluctant to implement the processing simplification required by the new IT systems or to adjust workflow and staff assignments accordingly. At times, the ICT was introduced without first streamlining, standardizing, and simplifying existing manual processes and procedures. In such cases, implementation fails to meet business expectations. Experience clearly shows that the basic principle should be to first standardize, consolidate, modernize, and simplify processes and procedures before computerization. In the absence of such simplification, the inefficient manual system may at best be replaced by an inefficient computerized system, with no gain to revenue collection or trade facilitation.

1.1.2 Trade Facilitation

Trade facilitation is a concept directed towards reducing the complexity and cost of the trade transaction process and ensuring that all these activities take place in an efficient, transparent and predictable manner. Trade facilitation comprises the whole trade chain from exporter to importer, including transportation and payment, with emphasis on the border-crossing and the agencies involved there.

Trade facilitation hence entails the simplification, modernization and harmonization of export and import processes which has emerged as an important issue for the world trading system. Trade facilitation includes provisions for expediting the movement, release and clearance of goods, including goods in transit. It also includes measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues. It further contains provisions for technical assistance and capacity building for the staff involved in Customs.

1.1.3 Customs Administration ICT Reforms in Kenya

Kenya revenue Authority (KRA) was established in 1995 as a semi-autonomous government agency responsible for revenue administration. The overall objective was to provide operational autonomy in revenue administration and enable its evolution into a modern, flexible and integrated revenue collection agency. KRA has over the years focused on reforming tax administration in Kenya. The Revenue Administration Reform and Modernization Program (RARMP) commenced in the year 2004 and its main objective was to transform KRA into a modern, fully integrated and client-focused organization. ICT has been an area that KRA has focused on in its strategy of reforming Customs administration (KRA, 2017).

ICT based Customs administration reforms initiatives by KRA include enhancement of Simba 2005 System through the Simba Transformation Project (STP), implementation of a new integrated Customs Management System (iCMS) to replace Simba 2005 System,

strengthening enforcement by overseeing the construction of One Stop Border Posts (OSBP) at key points of entry as well as creation of a Border Management Division and implementation of a Regional Electronic Cargo Tracking System (RECTS). KRA has also focused on the implementation of the Kenya national electronic single window system initiative meant to improve the clearance process at the port through easier interaction between importers and relevant government agencies. Moreover, KRA is enhancing uniformity in commodity valuation by finalizing implementation of the second phase of a Valuation Database (KRA, 2017). The study will seek to establish whether these ICT based reforms in Customs administration have impacted trade facilitation.

1.2 Statement of the Problem

Montagnat-Rentier and Parent (2012) outlined the reforms that had been achieved in the modernization of the customs administrations of sub-Saharan (African) countries since the mid-1990s. The highlight was on the progress that had been made in the reform and automation of operations and procedures and improvement of policies which had resulted to significantly in enhancing revenue collection and improvement of trade facilitation in a number of countries. However, Montagnat-Rentier and Parent (2012) noted that the pace and scope of modernization remains insufficient, particularly in developing customs control and enforcement capacities, and enhancing operational resources and management. Countries should therefore provide a strong commitment to reform, organizational and management changes, adequate technical assistance and project management, and effective implementation of modern customs standards, are critical to accelerate the modernization of customs in sub-Saharan Africa.

The World Bank (2016) indicates that Kenya's efficiency in Customs clearance is seven times worse than what one would expect in middle income countries of Asia such as Singapore. Kenya has been implementing various ICT based reforms in Customs to increase efficiency, trade facilitation and revenue collection. ICF (2014) notes that reforms Kenya have undertaken include automation, simplification of procedures, standardization, adoption of best practices and enhancing integrity. The outcomes of these reforms are unclear as no study has been conducted to establish whether the reforms have borne any fruits. This study therefore sought to explore the impact of the ICT based reforms on trade facilitation in Kenya.

1.3 Objectives of the Research

1.3.1 General Objectives

The general objective of this research was to establish the effect of reforms in custom administration system on trade facilitation in Kenya.

1.3.2 Specific Objectives

- i) To determine the effect of reforms in integrity of ICT infrastructure on trade facilitation in Kenya.
- ii) To evaluate the effect of improvements in efficiency of ICT service delivery on trade facilitation in Kenya.
- iii) To establish the effect of reforms in IT governance on trade facilitation in Kenya.

1.4 Research Questions

- i) What is the effect of reforms in integrity of ICT infrastructure on trade facilitation in Kenya?
- ii) How does the improvements in efficiency of ICT service delivery affect trade facilitation in Kenya?
- iii) What is the effect of reforms in IT governance on trade facilitation in Kenya?

1.5 Justification of the Study

Despite the advancements in Customs administration technology, Kenya still has a long way to go to reduce clearance time for goods. Being an issue of concern for businesses, it is important that this study be conducted so as to provide KRA, businesses and other users with information on how they can apply strategic security structures to improve on their performance. The study findings will be of value to government, business community, Customs Administration experts and consultants, stakeholders in the Customs administration sector, researchers and academicians.

To the government, the study findings will inform the government on what needs to be done to ensure that time taken and cost to clear goods along the borders is reduced. The study is expected to point out weak points in ICT reforms in Customs administration which the government through the various agencies such as KRA can act on.

The study will provide businesses with information on ICT based Customs Administration reforms and how they impact trade facilitation. It is the researcher's expectation that more businesses will get an insight into what systems are in place and

how they have influenced trade facilitation and therefore make decisions regarding export and imports accordingly.

The study will provide results that will show pros and cons of ICT reforms in Customs administration. This will provide stakeholders in the tax administration sector with information that would inform their decisions on how to make reforms more efficient so as to facilitate trade.

The study findings intend to benefit academicians and researchers by providing them with more theoretical and empirical literature. Moreover, the study will have limitations which future researchers can take note of to improve on their future studies. Similarly, the study will provide suggestions for further research which researchers can act on.

1.6 Scope of the Study

The research was conducted within the Customs administration department of Kenya Revenue Authority. This study focussed on the impact of ICT reforms in Customs administration on trade facilitation in Kenya. Though there are many reforms that had been conducted by KRA, the current study only focussed on reforms in integrity of ICT infrastructure, improvements in efficiency of ICT service delivery and reforms in IT governance. The target population was the employees in the Customs department of KRA, the clearing agents, importers and exporters. The study was conducted in April and May 2018.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews theoretical and empirical literature. The theoretical review section looks at the three theories that were applied to guide this study. Further, the chapter presents the conceptual framework and research gaps that this study anticipated to fill. Literature review seeks to convince the reader as to the significance or importance of the research objectives being considered. It convinces the reader that the research project will make an original contribution to the area being investigated. This indicates the review of relevant background material to identify gaps, weaknesses, problems or controversies that need to be addressed by the current research objectives.

2.2 Theoretical Review

This study was based on diffusion of innovations theory, technology acceptance model, social technical systems theory and strategic alignment theory. These theories were used to build a theoretical framework that guided the study in establishing the probable effect or relationship between the independent and dependent variables.

2.2.1 Diffusion of Innovations Theory

Diffusion of innovations theory (Rogers, 1962) seeks to explain the rate at which new technology spreads within organizations and communities. The theory also explains why and how technologies and new ideas are adopted in different organizations and societies. In the theory, diffusion is defined as the process through which a technology or new idea

is communicated and accepted in a social system. In the diffusion of innovations theory, three types of decisions are made in a social system about adoption of an idea or technology. The first is the optional innovation-decision, which is made by an individual, whether to adopt or not adopt the technology. The second is the collective innovation-decision, which is made collectively by all individuals in the social system. Lastly, is the authority innovation-decision, which is the decision, made for the entire social system by individuals who have power or influence in the social system (Armstrong & Sambamurthy, 2014). This explains the reasons that lead to organizations to adopt the different IT media and tools because of employee or organizational initiative. The social, political and economic aspects of the adoption decision are explained by this theory.

Additionally, diffusion of technologies theory provides an in-depth view of how the social, political, economic and cultural factors enable or hinder adoption of technology. The theory explains that organizations or institutions adopt new technology through authority innovation decisions and collective innovation decisions. The collective innovation decision in the context of this study is where the adoption of IT for the various organizational activities is made informally by employees and management (Rodgers, 2005). This relates to developing human resources to ensure human technical competence.

Authority innovation decision on the other hand is where decision is made by top management of the organization to adopt a certain technology. In this case, the decision is formal, and the management, employees and other stakeholders agree to use IT due to the

directions from the top management (Vannoy & Palvia, 2010). This means that the few people who have a position of power in an organization can make the decision to adopt the technology (Rodgers, 2005). Moreover, this theory also explains that in reaching the decisions, the benefits and costs of the innovation are considered. This theory therefore links Integrity of ICT systems in Customs to make Customs administration more modern to facilitate trade. These are factors that are based on authority decisions.

2.2.2 Technology Acceptance Model

Technology Acceptance Model (TAM) was devised by Davis (1989). Davis argued that TAM is an information systems theory that models how users come to accept and use a technology. Technology acceptance is the process through which users have the will and agree to use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. These include perceived usefulness and perceived ease-of-use.

Technology acceptance is further defined by Arning and Ziefle (2007) as the user's willingness, acceptance, agreement and the continuous use of any technological system. This can be classified into behaviour and attitude acceptance. In technology acceptance model, attitude towards using, the intention to start using and the actual adoption or use are indicators that the individual has accepted the technology and sees it as beneficial. The TAM explains the process by which technology is adopted by individuals and can be applied to organizations and institutions. This model indicates that an individual's actions and behaviour are guided by beliefs and perceptions.

In the case of IT integration and adoption in organizations, the beliefs of the organization's management, employees and partners about the benefits and challenges brought about by using the technology guides their behaviour and intention towards making use of the technology (Arning & Ziefle, 2007). The beliefs and intentions can be formed by external factors such as self-efficacy and structural factors of affording and sustaining the technology. Another external factor is competition from other organizations, use of IT in other organizations, use of IT in the community and experience of the employees and customers in using IT elsewhere (Armstrong & Sambamurthy, 2014). Self-efficacy is an individual's perception about their own capability of using the technology in question, their perception on the quality and functionality of the technology or perceptions about the social support that will be afforded by adopting the technology or the social support that the technology will bring. To be able to understand behaviour, perceptions and actions of users, it is important to understand these external factors first.

TAM assumes that there are some external factors that influence perceived usefulness and perceived ease of use (Chang, Yan & Tseng, 2012). These factors also intervene in the effect of external variables on user's attitude towards using a certain technology. The model therefore provides a basis for explaining the adoption process of the technology and the reasons behind or hindering any adoption (Pinho & Soares, 2011). In the technology acceptance model, though perceived ease of use and perceived usefulness are the major elements in the determination of an organization's acceptance, adoption and usage of IT, there are other factors about the technology that influence the decision.

These factors include the environment within which the decision is being made, features of the technology and the characteristics of users who are being targeted. From the foregoing, as the current study is focused on establishing the impact of ICT reforms in Customs administration on trade facilitation, TAM fits this study as it can explain how governance of ICT systems can enhance the ability of the systems to facilitate trade.

2.2.3 Strategic Alignment Theory

The theory of strategic alignment was devised by Luftman (1996). The concept of strategic alignment is primarily based on the notion that information systems must match organization strategy in order to forge a strong competitive edge and bring powerful solutions to real-world problems the organization is facing. The strategic alignment theory's basic premise is that traditional analysis has tended to concentrate on either the extent to which infrastructure and processes support an organization's strategy (strategic fit) or the extent to which ICT approaches support the business approaches (functional integration). However, Hua (2007) argues that a company must consider both 'strategic fit' and 'functional integration' to fully develop its competitive potential. Hence, the concept of strategic alignment is based on two building blocks: strategic fit and functional integration. And, within each block, there are the external and internal domains.

In the business strategy field, the external domain is the arena in which the organization competes and is concerned with business scope decisions, distinctive competency decisions and governance decisions. This domain is termed as business strategy. In KRA,

this should consider the happenings in Customs modernization in various jurisdictions in the world and the advantages the reforms are expected to bring in facilitating trade. Correspondingly, the internal domain is concerned with choices that define the administrative structure, the design or redesign of critical business processes and the acquisition and development of human resource skills. This domain is termed as ‘organizational infrastructure and processes’ (Hua, 2017). To ensure that ICT reforms are aligned with KRA strategy, the domain of ICT infrastructure and processes becomes of essential importance. This seeks to align the procured ICT systems with the needs of the organization and developing employee skills to ensure that employees can be able to utilize the implemented ICT infrastructure. Failure to build human skill competencies will result to poor alignment of ICT strategy and KRA strategy which will then result to poor employee and organizational outcomes (Allaart et al., 2012). This theory was used in this study to depict the reforms in efficiency and how they can enhance the ability of KRA to perform its mandate of trade facilitation through efficiency in customs administration.

2.2.4 Social Technical Systems Theory

The social technical systems theory by Bostrom and Heinen (1977) explains how an ICT implementation in a service organization influences employees’ job characteristics and job outcomes. Social technical systems theory offers a framework to help understand the interdependencies between the human and technology factors of modern organizations. The social technical systems theoretical perspective was developed in response to findings that organizations were not attaining expected benefits from new technology

implementations. Social technical systems theory notes that organizations comprise two sub-systems—namely, a social system and a technical system (Mumford, 2000). The social sub-system comprises the structural and human elements in an ICT environment, while the technical subsystem includes the technology and tasks that individuals will perform using the ICT. Technical systems typically seek to maximize task accomplishment, while social systems focus on improving quality of work life.

Social technical systems theory posits that, while implementing technologies, the goal should be the joint optimization of the social and technical systems. The joint optimization or the fit between the social and technical systems can only be achieved when human needs are faithfully considered during the implementation of a technology. It is the fit between these two sub-systems that influences the success of an implementation. Fit occurs when a design process optimizes both subsystems. Imbalance in the two systems leads to negative outcomes, such as reduced work performance (Holman et al., 2005). To ensure ICT modernization leads to positive outcomes in trade facilitation, KRA should ensure that all stakeholders need to be considered in implementing new technology to ensure that use of new technology is efficient. More importantly, users of the systems need to be trained and supported.

2.3 Conceptual Framework

In the current study, integrity of ICT infrastructure, efficiency of ICT service delivery and ICT governance are the independent variables. The dependent variable is trade

facilitation. The independent variables are hypothesized to have an impact on trade facilitation. The relationship expected is indicated in Figure 2.1.

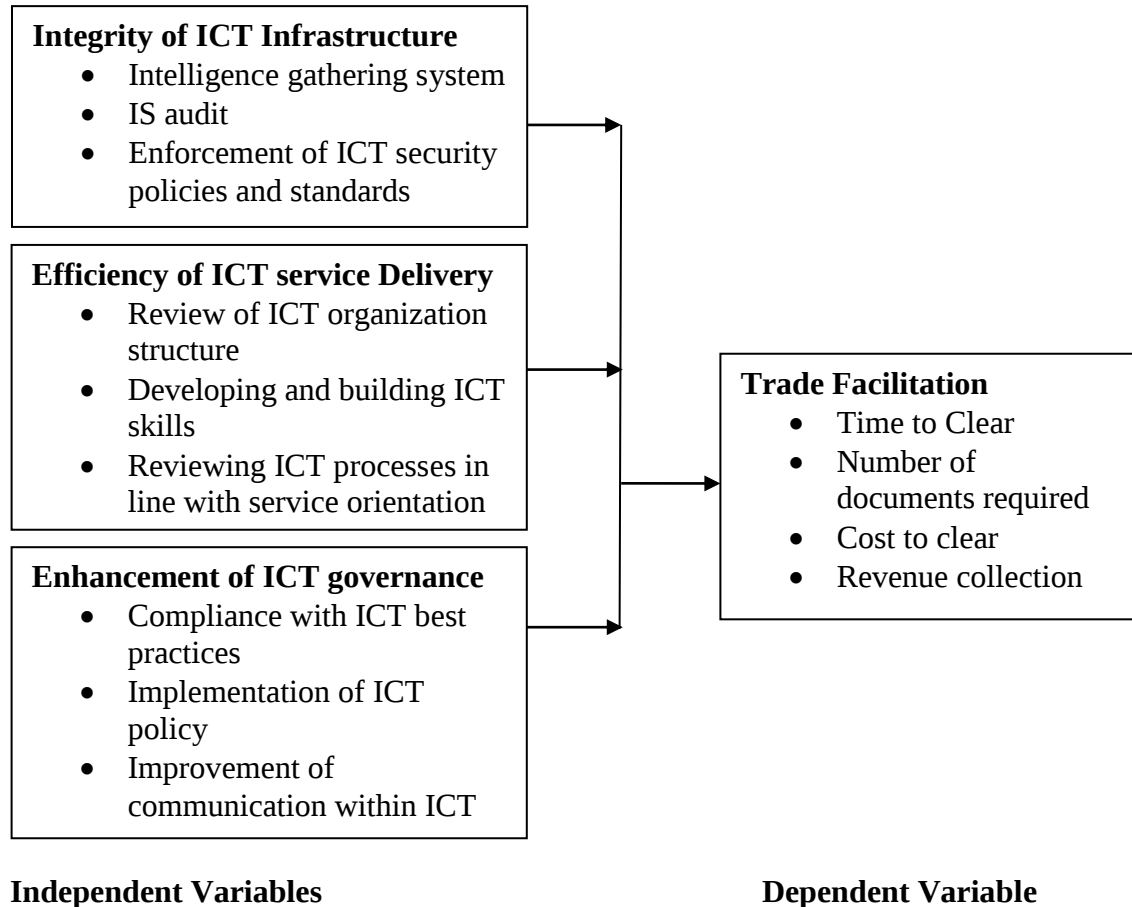


Figure 2.1: Conceptual Framework

2.3.1 Integrity of ICT infrastructure

The integrity of ICT infrastructure depicts the level of physical security controls that are used to protect information systems. Access controls are designed to prevent unauthorized access to hardware and/or data storage. Integrity was assessed through presence of intelligence gathering system, installation of a Tax Management System, regular independent information system audit and effective management of customs system infrastructure and system access. Moreover, integrity was measured by the review

and enforcement of ICT and Information Security Policies and Standards, implementation of secure Access to the data and information, having a Single-Sign-On Capability, development of policies and guidelines on USB usage and security and having formal ISO27001 security certification for the Customs services. Lastly, integrity of the Customs system was indicated by how KRA has integrated Customs system security to Enterprise Risk Management framework.

2.3.2 Efficiency of ICT service Delivery

Efficiency of ICT in service delivery were assessed through the extent that KRA reviews of the ICT organizational structure in the spirit of getting ahead of the curve in order to assure business value, the extent to which KRA recruits experienced staff with relevant skills in line with best practice and the extent that KRA develops, enhances and builds ICT skills capacity. Moreover, KRA's effectiveness in deploying and managing human resources, its regular review processes of ICT in line with service orientation were other indicators of reforms in efficiency of ICT service delivery. Other indicators of reforms in efficiency include KRA's implementation of framework contracts to allow sourcing of specialized skills on need basis, KRA's application of international best practices to frame the delivery, management and support of ICT services, KRA's adoption, building capacity, developing and implementing SLA based service delivery support framework and KRA's exploitation of ITSM Tool for enhanced management of ICT services.

2.3.3 Enhancement of ICT governance

Reforms in ICT governance were indicated by improvements in KRA's IT Governance by enhancing compliance to IT best practices, standards, and governance policies, regular review and updates to procedures, adoption and implementation of ICT best practices, standards and governance policies and development and implementation of an ICT policy. Other indicators of reforms in ICT governance include decentralization of ICT support staff to business functions, increase in funding of ICT and improvements in communication within ICT.

2.4 Empirical Review

Studies carried out on ICT based Customs administration reforms and trade facilitation are reviewed in this section. Specifically, this section reviews studies on integrity of ICT infrastructure, efficiency of ICT service delivery and ICT governance. The relationship between these sub variables on ICT reforms in Customs administration and trade facilitation is discussed.

2.4.1 Integrity of ICT Infrastructure

Zake (2012) investigated Customs administration reform and modernization in Anglophone Africa in early 1990s to mid-2010. The author noted that Anglophone African countries had been implementing reform and modernization initiatives in their Customs administrations. The study established that most African jurisdictions had engaged in wide reform initiatives that comprised of adoption of modern ICT hardware and software and enhancing the security and integrity of their systems. However, the

study suggests that Customs administration reform and modernization initiatives in Anglophone African countries generally lagged behind international good practice and it is necessary to speed up implementation if trade facilitation, and trade chain security objectives are to be achieved. The findings also had implications on the design of reform programs and focus of potential technical assistance for the outstanding reform agenda.

In a study by Reddick (2014) on Customs administration system standards and security, South Africa, Uganda, and Mauritius exceeded the 2014 World average rating of 2.59; and with Tanzania, The Gambia, and Ghana, they performed above the Sub-Saharan Africa average. The worst performers during this period were Botswana, Namibia, and Rwanda. Continuous modernization appears to have played an important part in South Africa's ranking, while evidence of increased automation played a part in the other countries. These countries had enabled to reforms their systems to international standards for better service delivery.

In the case of Rwanda, FAD revenue administration analysis confirmed very high Customs release times in excess of nine days for both air and land cargo in 2012 despite adoption of new ICT systems (Wulf & Sokol, 2014). Regarding the latter, they maintain that technology adoption is shaped by three sets of variables: exposure, capacity to adopt and use and state policies. Exposure refers to the external connectedness of the nation. Such connectedness provides nations with the knowledge of the technology and an incentive for its adoption. Countries with many links to the outside world have an interest in reducing the cost and expanding the speed of those connections. Capacity to adopt and

use ICT refers to the level of income and other resources (cognitive skills and technological infrastructure) a nation may possess to adopt technology. Per capita GDP and human or physical capital are considered to play a major role in technology adoption.

2.4.2 Efficiency of ICT service delivery

Kyobe (2016) noted that jurisdictions such as Sub-Saharan Africa had modernized their Customs administration systems aimed at simplification of processes and trade facilitation. A few Anglophone African countries conducted time release studies (TRS) with the assistance of the WCO starting with the Kenya (2009 and 2012), Malawi (2010), Rwanda (2012), Uganda (2013), Tanzania (2010), and Zambia (2012). The 2012 Kenya repeat study suggested that facilitation had deteriorated rather than improved. Comparative data available on the efficiency of Customs systems from the World Bank's Development Indicators for 2011 and 2014 are indicative of recent progress in reforming Customs administration processes.

Reddick (2014) identified resistance from employees, legacy systems constraints, cultural and political constraints, lack of senior management commitment, negative employee attitude and resistance to change as the challenges to the modernization of Customs systems within public revenue agencies. Another key factor is the need for current business processes to be reengineered to become more efficient at the delivery of services which would require radical organizational change. This hinders the ability of the ICT reforms to have a positive effect on trade facilitation.

According to Young (2015) the following factors are common barriers to the achievement of trade facilitation even after customs modernization: limited implementation time of the ICT systems, poor information systems architecture, limited funds, and inability to monitor and review systems performance. Mulwa (2015) also noted that the effectiveness the ICT reforms in enhancing service delivery plays a critical role in enabling the customs administration system to facilitate trade.

In assessing the role of training on enhancing the efficiency with which employees use of new customs administration systems, Yamin and Sim (2016) in a study in Maldives established that training of the employees was a critical factor in determining use of the systems for trade facilitation. These findings were also supported by Kilkelly (2011) who established that training in both technical and soft skills was critical in enhancing the chances of success of modernized Customs systems to facilitate trade. Kilkelly postulated that, despite the availability and uptake of ICT systems training, fundamental skill gaps remain. The skills gaps in systems utilization takes two forms – technical skills and interpersonal or soft skills – and that they are common at every level, from the systems adoption through to user support.

In a study in Denmark, Rolstadas, Tommelein, Schiefloe and Ballard (2014) explored the factors that enabled Customs systems to facilitate trade. They noted that much of the focus for project management falls on project managers, but a successful rollout for Customs ICT projects relies on the effective, timely actions of individuals at three levels: project sponsors; project or team managers; and members of the project team. HR

department needs to ensure each is competent in their particular roles or identify how to address skill gaps. In general, it is beneficial to use a project- management skills competency framework or an assessment center to gauge current levels of skills and ability. Any skill gaps ideally should be addressed in advance through capacity building. This enables the employee to be able to utilize the new system effectively to facilitate trade.

Patanakul and Shenhar (2012) argued that training should also be advanced to Customs administration employees for any adopted system to be successful in enabling trade facilitation. Project sponsors tend to be senior executives who are responsible for owning the Customs modernization project and supporting the project manager when required, although they do not have day to day responsibility for the execution of the project. The skills they need tend to be softer skills, such as governance, diligence, leadership, ownership. They also need to understand the level of involvement they should have in any project or program. Some best practice project management training includes modules on being a project sponsor, but more specific management development, such as specially tailored e-learning, coaching or mentoring, can be more effective in improving a sponsor's skills. These skills ensure that all those concerned in rolling out any modernization project are well skilled and hence the success of the project in facilitating trade is increased.

Müller and Jugdev (2012) observed that for a Customs modernization project to be implemented effectively, project or team managers must have a wide range of skills and

abilities in order to ensure a successful outcome. Formal project management skills and qualifications are an obvious prerequisite, as is the ability to remove any obstacles to success and ensure that the flow of work is taking place at the right pace. In addition, they need interpersonal and persuasive skills in order to engage the assistance of colleagues who are not officially assigned to the project. Ultimately, they need to manage the project and free the project team to concentrate on moving the project forward. Coaching and mentoring are invaluable in developing less experienced project managers.

The view of training as a critical success factor in Customs modernization projects was also supported by findings from a study by Gelinas (2010). Gelinas observed that project team members need to understand the scope of the project and their role. More specifically, they need to understand the terminology, tools and practical techniques to be used and the level of quality expected of them. They may not need project management qualifications, but they will need training in the specific tools and systems being used.

2.4.4 ICT Governance

In a study in South Africa, Gewanlal and Bekker (2015) sought to establish the effect of improvements in ICT governance (ITG) by enhancing compliance to ICT best practices, standards, and governance policies. The study reported that the most important attributing factors were improving the ICT governance by enhancing compliance with best practice frameworks, standards, procedures and governance policies. This ensures that the customs administration system in place can perform its functions effectively.

Developing and implementing an ICT policy was indicated as a key factor in enabling the system to be effective in trade facilitation (Patanakul & Shenhar, 2012). ICT policy essential for the success of the Customs administration system. Users rely on the system to make clearance, but they have to put information in the prescribed format. Having a policy that dictates how the system is used by all stakeholders ensures that the users get the correct services from the system and they use less time and effort in using the system. This enables the system to speed up clearance and also to reduce the cost of clearance.

In their study on the role of decentralize the ICT support staff to business functions in increasing efficiency of modernized Customs systems, White and Fortune (2012) outlined the reasons why the support staff need to be decentralized. These reasons included in cases the system does not work as required, when users are not familiar with the project and when users do not understand the format of information required to be input in the system. The conclusion from the study was that users of any new Customs systems required 24-hour support from the revenue collection agency to effectively use the system.

2.5 Summary

This chapter has presented the theoretical and empirical review which provides a basis of the study. The four theories that the study is based on including the diffusion of innovations theory, technology acceptance model, strategic alignment theory and social technical systems theory have been presented. Moreover, the chapter presents the empirical studies that relate the variables of the study. The conceptual framework that

guides the study has also been presented which relates the independent variables to the dependent variable. The critique of the reviewed literature and the research gaps that the current study sought to fill is also presented.

2.6 Research Gap

Most of the studies that have been carried out on modernization of Customs administrations in other countries in Europe (Eskerod & Huemann, 2013), Asia (Vijaya, 2016)) and in some parts of Africa (Olateju et al., 2011; Stukenbruck & Zomorrodian, 2015). There are limited studies on reforms on Customs modernization systems in Kenya and how such reforms enable facilitation of trade in the country. This study is hence informed by this gap and it seeks to establish how the reforms in Customs systems influence trade facilitation.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the process used to collect information and data for the purpose of answering the research questions (Cresswell, 2013). This chapter presents the research design, the target population and the sampling technique. Also presented in the chapter is the procedure for data collection, data collection instruments and the methods that were applied for data analysis and presentation. Moreover, the pilot testing of questionnaires is also presented.

3.2 Research Design

This study was a descriptive cross-sectional survey. Thomas (2011) noted that a descriptive survey is a study designed to collect data or information on some given units or observations without influencing the study environment. Creswell (2013) on the other hand, indicated that a survey provides a framework that enables the researcher to have an analysis of a number of units in relation to the variable of interest. Since the study was aimed at establishing the impact of ICT customs administration reforms on trade facilitation, this design was suited for the current study as it described the ICT reforms and the relationship between the reforms and trade facilitation.

3.3 Target Population

This study was carried out in Nairobi. The study involved 492 employees at the Customs Administration Departments of KRA (KRA, 2017). These were the only respondents who

were conversant with the KRA internal system. Mugenda and Mugenda (2003) observe that target population is the entire group that a researcher wishes to draw conclusions about. The study selected the target respondents in this study to include employees in the customs administration department as they were the ones who understood the effect that ICT reforms had on trade facilitation. These potential respondents interacted with the system in the course of their work, duties and responsibilities.

Table 3.1: Target Population

Level	Frequency	Percentage
Top Management	4	1
Middle Management	35	7
Lower management	127	26
Officers	326	66
Total	492	100

Source: KRA (2017)

3.4 Sampling Frame

The sampling frame that was applied in this study was a list of employees in the Customs Services Department of KRA. This sampling frame which was sourced from the HR and ICT departments of KRA. This sampling frame was selected as it included all employees and other actors of interest in this study and hence provided a good basis for selecting the study participants.

3.5 Sample and Sampling Technique

This study employed stratified sampling technique to select the study participants. Babbie (2011) observes that stratified sampling technique is important when the population of

study includes non-homogenous entities. In the current study, the population of interest included employees of different cadres in the department and other stakeholders who interacted with the ICT system. Getting a representative sample was hence critical to ensure that data collected included views from all participants targeted.

A sample was selected through the sample calculation formula by Yamane (1967) as quoted in Israel (2013). A 10% significance level was applied.

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

Where;

N is the size of population,

n is the sample size and

e is the significance level required.

The significance level used was 0.1 or 10%. The sample size for this study was 83 respondents. This was distributed to the various management levels and other targets proportionately as indicated in Table 3.2.

Table 3.2: Sample

Categories	Population	Sample	Percentage
Top Management	4	1	1
Middle Management	35	6	7
Lower management	127	21	26
Officers	326	55	66
Total	492	83	100

3.6 Instruments for Data Collection

Questionnaire was utilized as data collection instrument in the current study. Gillham (2008) noted that a questionnaire is efficient for data collection as it ensures standard responses to prepared questions from the study respondents. The questionnaire was employed due to its economy, ability to get standard responses and the lesser effort required to collect the data in comparison to other methods such as interviews. The questionnaire was designed after a review of literature on ICT reforms in Customs administration and trade facilitation. The questionnaire had 5 parts. The first part included general questions on the respondents while the second part had questions on trade facilitation in Kenya. The other three parts had questions that related to each of the three independent variables. The scales of measurement used for this study were primarily likert scale questions (Kothari, 2004).

3.7 Data Collection Procedure

Data collection started after the final questionnaire was drafted and permission granted from the School to collect data. The first step was to sample the respondents using the list provided by the HR and ICT departments. Secondly, the questionnaires were administered to the selected respondents from the Customs Services Department and others who interacted with the ICT system. The questionnaires were dropped at each respondent's working station. The date of collection of the filled questionnaire was agreed with the respondents during the time of administration.

Follow-up was done through e-mail, telephone or personal visits as was deemed necessary to ensure that the respondents who were left with the questionnaires responded to the items. This ensured high response rate. After the respondents had filled the questionnaire, they were collected by the researcher. Follow-up continue until a reasonable response rate was achieved.

3.8 Pilot Test

Before the final questionnaire used in the study was drafted, the draft questionnaire was tested for reliability and validity to ensure that it was fit for data collection. A pilot test was conducted with 10 employees from the Customs Services Department who did not participate in the final study. The pilot respondents were asked to rate the questionnaire on clarity, readability and comprehensiveness. Their recommendations were used to make amendments to the final questionnaire.

3.8.1 Validity of the study instruments

Validity according to Robson (2002) is a measure of whether the data generated by the data collection tool meaningfully represent the variable being measured. In addition, validity relates to whether all the knowledge and meaning of informants has been achieved (Easterby-Smith et al, 1999). Two types of validity that the questionnaire was tested on are content and face validity. Expert reviews of the questionnaire were done with the help of a few Customs administration personnel from the organization. Secondary review of data and information about trade facilitation was done to collaborate the data from the respondents.

3.8.2 Reliability of study instruments

Coolican (2004) indicates that reliability is the ability of a test to elicit similar responses or results after repeated administrations. Since the questionnaire was assessing modernization of Customs administration and trade facilitation, Cronbach Alpha was applied to test reliability of the likert rating scales. Cronbach alpha tests the internal consistency with which each respondent answers the various questions. The higher the consistency, the higher the reliability of the items. A Cronbach alpha of 0.7 is indicated as the threshold below which the scale is not be considered to be reliable. However, Cronbach alpha of 0.6 is acceptable for exploratory research (Kurpius and Stafford, 2006). For the questionnaire items, all alphas were above 0.7 and hence the items were considered reliable.

3.9 Data Processing and Analysis

Data analysis started by inspecting the collected questionnaires to ensure that they were correctly and comprehensively filled. Only the questionnaires that were correctly and comprehensively filled were included in data analysis. After inspecting the questionnaires, the researcher continued with coding of the questionnaires and entering the responses into software which assisted in analysis. Statistical Package for the Social Sciences (SPSS) Version 24 was used for data analysis.

Analysis was through both descriptive and regression statistics. Descriptive statistics that were utilized included percentages, mean scores and frequency distributions. These were utilized to enable a description of the various data that was collected. Inferential statistics

that were utilized included regression analysis that assisted in establishing the effect of ICT reforms in Customs on trade facilitation. The applied regression model was of the form;

$$TF = \beta_0 + \beta_1 Int + \beta_2 Eff + \beta_3 Gov + e$$

Where, TF = Trade facilitation

β_0 = Constant

β_i = Regression coefficients

Int = ICT integrity reforms

Eff = ICT efficiency reforms

Gov = ICT Governance reforms

e = Error term

Presentation of results for both the descriptive and inferential statistics was through tables, pie-charts and graphs. This enabled a visual representation of the study findings which made it more comprehensible to the reader.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

Data analysis and research findings are presented in this chapter. Presentation is done using tables and charts. Presented first is the response rate then demographic characteristics of the respondents are presented. Findings of the study are then presented based on research objectives. The general objective of this research was to establish the effect of reforms in custom administration system integrity, efficiency and governance on trade facilitation in Kenya. The specific objectives of the study were to determine the effect of reforms in integrity of ICT infrastructure, improvements in efficiency of ICT service delivery and reforms in IT governance on trade facilitation in Kenya.

The study targeted 83 respondents who had intimate knowledge of KRA ICT systems. Fifty-eight respondents answered the questionnaire which represented a response rate of 70%. To analyze the data collected, the study applied both descriptive and regression statistics. Descriptive statistics that were used included percentages, mean scores and frequency distributions. These were utilized to enable a description of the various data that was collected. Inferential statistics that were utilized included regression analysis that assisted in establishing the effect of ICT reforms in Customs on trade facilitation.

4.2 Demographic Analysis

The study sought some demographic information from the respondents. The first was to assess the number of years the respondents had worked in their organizations. Results

about years of service at the organization are presented in Figure 4.1. The results show that 43% of the respondents had worked at their organization for less than five years while seven percent had worked at their organization for over 20 years. Most of the employees had served in their current organization for less than 10 years.

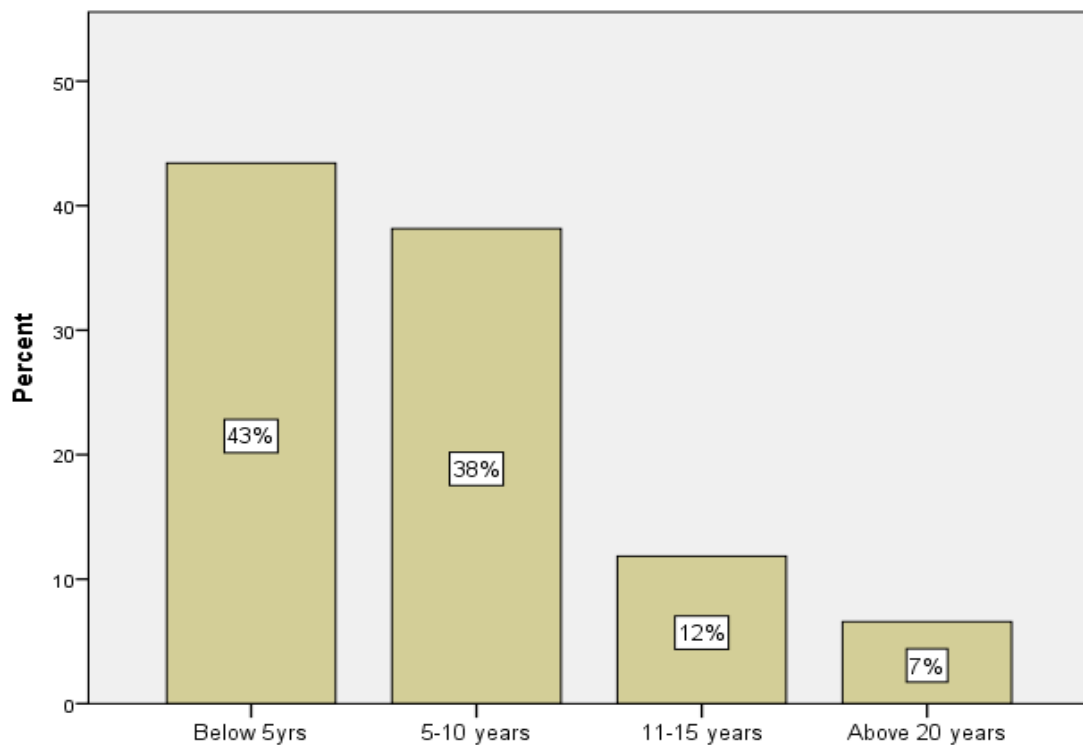


Figure 4.1: Years of Working in the Organization

Further, respondents were required to indicate their level of management. Results presented in Figure 4.2 show that 42% of the respondents were from lower management while 26% were in middle management.

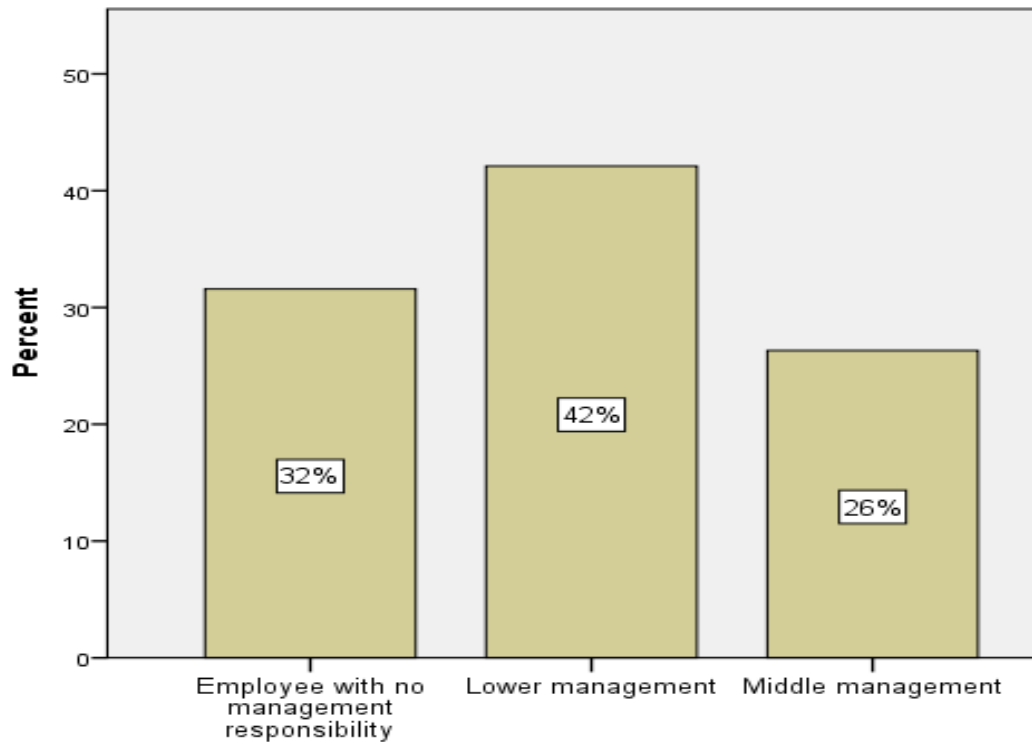


Figure 4.2: Level of Management of Respondents

The highest level of education for the respondents was also enquired. The results were as presented in Figure 4.3. Study findings reveal that 51% of the respondents had undergraduate level of education while just seven percent of the respondents had diploma level of education. These findings indicate that the respondents had requisite level of education to understand the questionnaire items and also to respond on the subject matter.

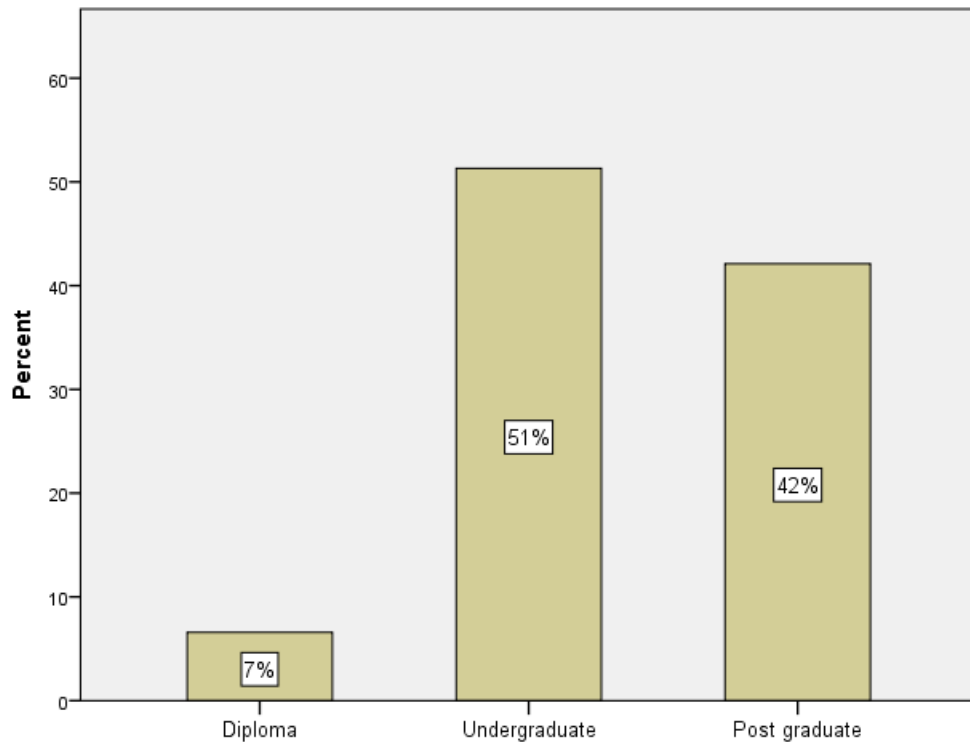


Figure 4.3: Education Level of Respondents

4.4 Reforms in Integrity of ICT Infrastructure

The first objective of the study was to establish the effect of reforms in integrity of ICT infrastructure. To achieve this objective, statements were provided to the respondents and the respondents were asked to indicate the extent to which they agreed with the statements regarding integrity of KRA's ICT infrastructure. The rating used was 1- Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree and 5 – Strongly agree. Analysis of the responses was through mean scores and standard deviations which are presented in Table 4.1.

Table 4.1: Reforms in KRA's ICT Infrastructure Integrity

Statement	MS	SD
The customs administration system has an intelligence gathering system (IGS)	4.04	0.573
The reforms in ICT infrastructure involved installation of a Tax Management System (TIMS)	3.88	0.692
The Customs department undertakes an independent IS Audit (ISA)	4.22	0.820
KRA manages the Customs system infrastructure And System Access (IMA) effectively	4.17	0.916
KRA reviews and enforces ICT and Information Security Policies and Standards (ISS)	3.92	0.529
KRA has implemented Secure Access to its data and information (SAD)	4.61	0.718
The customs system has implemented a Single-Sign-On Capability (SSC)	4.09	0.628
KRA has developed policies and guidelines for USB usage and security (USBS).	3.43	0.773
KRA is working towards formal ISO27001 security certification for its Customs services (ISO27)	3.87	0.629
KRA has integrated Customs system security to Enterprise Risk Management framework (IERM)	3.77	0.815

The study results presented in Table 4.1 indicate that respondents strongly agreed to the statement that KRA has implemented secure access to its data and information (SAD) (MS = 3.88). Study results also indicate that respondents agreed to the statements that the Customs department undertakes an independent IS Audit (ISA) (MS= 4.22), KRA manages the Customs system infrastructure and system access (IMA) effectively (MS= 4.17), the customs system has implemented a Single-Sign-On Capability (SSC) (MS= 4.09) and also agreed that the customs administration system has an intelligence gathering system (IGS) (MS= 4.04). Respondents also agreed to all the other statements that were provided regarding ICT infrastructure integrity.

These findings indicate that KRA had been able to enhance the integrity of its ICT infrastructure. These study findings support the findings by Reddick (2014) on Customs administration system standards and security. The study had established that South Africa, Kenya, Uganda, and Mauritius had exceeded the 2014 World average rating of 2.59 on ICT infrastructure integrity. and with Tanzania, The Gambia, and Ghana, they performed above the Sub-Saharan Africa average. The study indicated that continuous modernization and reforms appears to have played an important part in the countries' ranking while evidence of increased automation played a part in the improvements of integrity of ICT systems.

4.4.2 Efficiency of ICT Service Delivery

The study had an objective to how reforms in KRA's ICT efficiency affects trade facilitation in Kenya. Statements that related to reforms in efficiency of ICT in service delivery in KRA were listed. Respondents were required to rate their agreements regarding the provided statements. The rating scale was on a scale of 1 to 5 (1- Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree and 5 - Strongly agree). Responses were analyzed through mean scores and standard deviations and presented in Table 4.2.

Table 4.2: Efficiency of ICT Service Delivery

Statement	MS	SD
KRA reviews the ICT organizational structure in the spirit of getting ahead of the curve in order to assure business value	4.25	1.145
KRA recruits experienced staff with relevant skills in line with best practice	4.37	0.761
KRA develops, enhances and builds ICT skills capacity	3.93	0.826
KRA effectively deploys and Manages Human Resources	4.30	0.502
KRA frequently reviews processes of ICT in Line with service orientation	4.01	0.692
KRA implements framework contracts to allow Sourcing of Specialized Skills on Need Basis	3.98	0.781
KRA continue to use International best practices to frame the delivery, management and support of ICT services	4.29	0.985
KRA adopts and builds capacity to develop and implement SLA based service delivery support framework	4.07	0.703
KRA exploits ITSM Tool for enhanced management of ICT services	4.05	0.771

Results as presented in Table 4.2 indicate that the respondents agreed to all the statements provided regarding reforms in efficiency of ICT service delivery. Specifically, respondents agreed that KRA recruits experienced staff with relevant skills in line with best practice (MS = 4.37) and that KRA effectively deploys and manages human resources (MS = 4.30). Additionally, respondents agreed that KRA continue to use international best practices to frame the delivery, management and support of ICT services (MS = 4.29), that KRA reviews the ICT organizational structure in the spirit of getting ahead of the curve in order to assure business value (MS = 4.25) and also agreed that KRA adopts and builds capacity to develop and implement SLA based service delivery support framework (MS = 4.07).

Study findings also indicate that respondents agreed that KRA exploits ITSM Tool for enhanced management of ICT services (MS = 4.05) while they also agreed that KRA

frequently reviews processes of ICT in Line with service orientation (MS = 4.01). additionally, findings reveal that KRA implements framework contracts to allow sourcing of specialized skills on need basis (MS = 3.98) and showed agreement to the statement that KRA develops, enhances and builds ICT skills capacity (MS = 3.93).

These findings reveal that KRA had adopted international best practices and had reformed its ICT efficiency in delivery of services. These findings support the findings by Kyobe (2016) who noted that jurisdictions in Sub-Saharan African countries had modernized their Customs administration systems aimed at simplification of processes and trade facilitation. Kyobe (2016) observed that a few Anglophone African countries conducted time release studies (TRS) with the assistance of the WCO starting with Kenya (2009 and 2012), Malawi (2010), Rwanda (2012), Uganda (2013), Tanzania (2010), and Zambia (2012). Moreover, the findings collaborate the comparative data available on the efficiency of Customs systems from the World Bank's Development Indicators for 2011 and 2014 which were indicative of recent progress in reforming Customs administration systems and processes.

4.4.3 Reforms in ICT governance

The study further sought to establish the effect of reforms in ICT governance at KRA and its effect on trade facilitation in Kenya. Statements regarding ICT governance were listed and respondents were required to indicate their level of agreement. Respondents were required to use the following ratings: 1- Strongly disagree; 2 – Disagree; 3 – Neutral; 4 – Agree, and; 5 - Strongly agree. Mean scores were used for analysis and results are presented in Table 4.3.

Table 4.3: Reforms in ICT Governance

Statement	MS	SD
KRA has improved IT governance by enhancing compliance to IT best practices, standards, and governance policies	4.42	1.052
KRA reviews and updates procedures regularly	4.64	0.782
KRA adopts and implements ICT best practices, standards and governance policies	4.08	0.699
KRA has developed and implemented an ICT policy	4.76	0.720
KRA has decentralized ICT support staff to business functions	4.41	0.618
KRA has increased the funding of ICT	4.35	0.803
KRA has improved communication within ICT	3.96	0.682

Study results presented in Table 4.3 show that respondents strongly agreed with the statement that KRA has developed and implemented an ICT policy (MS = 4.76) and also showed strong agreement to the statement that KRA reviews and updates procedures regularly (MS = 4.64). The study findings also indicate that respondents agreed to all the other provided statements. Specifically, respondents agreed that KRA has improved IT governance by enhancing compliance to IT best practices, standards, and governance policies (MS = 4.42). Moreover, respondents indicated that KRA has decentralized ICT support staff to business functions (MS = 4.41), increased the funding of ICT (MS = 4.35), adopted and implemented ICT best practices, standards and governance policies (MS = 4.41) and improved communication within ICT (MS = 3.96).

These findings indicate that KRA has improved its ICT governance through the various reforms in communication, funding, and improvement in IT governance by enhancing compliance to IT best practices, standards, and governance policies. Moreover, the ICT governance had been improved through regular reviews and updates to procedures,

development and implementation of an ICT policy and through decentralization of ICT support staff to business functions. These findings support the results from a study in South Africa by Gewanlal and Bekker (2015) which sought to establish the effect of improvements in ICT governance (ITG) by enhancing compliance to ICT best practices, standards, and governance policies. The study by Gewanlal and Bekker (2015) reported that the most important attributing factors were improving the ICT governance by enhancing compliance with best practice frameworks, standards, procedures and governance policies. This ensures that the customs administration system in place can perform its functions effectively. This hence implies that KRA ICT systems are capable of facilitating trade.

4.4.4 Trade Facilitation

The study sought to determine the effect reforms in ICT at KRA on trade facilitation. To assess trade facilitation, the study used indicators such as time to clear, number of documents required, cost to clear and revenue collection. Respondents were asked to indicate whether the ICT reforms had led to greatly improvement, improvement, no change or deterioration in all these metrics. Analysis of findings was through percentages for every response. Results are presented in Table 4.4. Results on performance indicate that performance of Nakumatt Holdings had improved on all metrics. Results indicate that 63 percent of the respondents indicated that there was great improvement in regard to number of documents required while 47 percent indicated that there was great improvement regarding time to clear goods. Further, 35 percent indicated that there was

great improvement in relation to cost to clear goods while 29 percent noted great improvement in relation to revenue collection.

Table 4.4: Facilitation of Trade

Performance measure	Greatly improved	Improved	Remained the same	Deteriorated
Time to Clear	47	26	22	5
Number of documents required	63	19	10	8
Cost to clear	35	27	14	24
Revenue collection	29	32	19	20

4.5 Regression Results

A multiple linear regression analysis was performed to test the cause and effect relationship between the independent and the dependent variables. The average ratings for the three independent variables (ICT integrity, efficiency in ICT service delivery and ICT governance) were used as the indicators for input into the regression model. Four measures of trade facilitation (Time to Clear, Number of documents required, Cost to clear and Revenue collection) were used where an average for each respondent was computed.

The coefficient of determination and standard error of the regression model is indicated in Table 4.5. Results in Table 4.5 indicate that the adjusted r^2 was 0.581 indicating that the independent variables explained 58.1% of the change in trade facilitation hence 41.9 percent was explained by other factors not explained in the model. This indicates that the model had good explanatory power.

Table 4.5: Regression Model Parameters

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762	.581	.547	.603

Further, the regression output in Table 4.6 presents the source of variance, mean of variances and the f value. The results indicate that the overall model was significant (f value = 24.894; $p < 0.05$) and could provide important results. This indicates that the model could provide some predictive significance and was a good fit.

Table 4.6: Analysis of Variance of the Regression

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	21.881	3	7.294	24.894	.000
Residual	15.803	54	.293		
Total	37.684	57			

Further, the regression output on significance of the independent variables is presented in Table 4.7. The results indicate that reforms in ICT integrity had significantly and positively affected trade facilitation ($\beta = 0.540$; $t = 4.714$; $p < 0.05$). This indicates that the reforms that were adopted at KRA to enhance ICT integrity had enabled the organization to enhance trade facilitation by improving time to clear, lowering cost to clear and reducing the number of documents required to clear. These results support the findings from a study by Reddick (2014) on who indicated that reforms in Customs administration system standards and security had enabled countries such as South Africa, Uganda, Mauritius, Tanzania, The Gambia and Ghana to enhance ease of doing trade in those countries regarding either export or import of goods.

Further, reforms in efficiency of ICT service delivery positively and significantly influenced trade facilitation ($\beta = 0.385$; $t = 2.550$; $p < 0.05$). This result indicates that there were significant improvements in efficiency of ICT services provided to importers

and exporters that enabled KRA to improve to trade facilitation. These study results support the findings by Young (2015) that the common barriers to the achievement of trade facilitation even after customs modernization are limited implementation time of the ICT systems, poor information systems architecture, limited funds, and inability to monitor and review systems performance. Since KRA had performed better in these areas, its ICT systems had enabled it to facilitate trade. Moreover, the findings agree with the findings by Mulwa (2015) that the effectiveness the ICT reforms in enhancing service delivery plays a critical role in enabling the customs administration system to facilitate trade.

Reforms in ICT governance at KRA had a significant and positive effect on trade facilitation ($\beta = 0.174$; $t = 2.096$; $p < 0.05$). This indicates that at KRA, reforms that had been done to enhance governance of ICT were good and this made them to significantly and positively influence trade facilitation. These findings relate to the findings by Gewanlal and Bekker (2015) who established that improvements in ICT governance (ITG) by enhancing compliance to ICT best practices, standards, and governance policies ensures that the customs administration system in place can perform its functions effectively. The findings also agreed with findings by Patanakul and Shenhar (2012) that developing and implementing an ICT policy was indicated as a key factor in enabling the system to be effective in trade facilitation. Findings by Patanakul and Shenhar (2012) indicated that ICT policy is essential for the success of the Customs administration system since users rely on the system to make clearance, but they have to put information in the prescribed format. Having a policy that dictates how the system is used by all stakeholders ensures that the users get the correct services from the system and they use

less time and effort in using the system. This enables the system to speed up clearance and also to reduce the cost of clearance.

Table 4.7: Significance of Independent Variables

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.210	.461		4.795	.000
ICT integrity	.540	.114	.583	4.714	.000
Efficiency in ICT service delivery	.385	.151	.356	2.550	.013
ICT governance	.174	.083	.284	2.096	.040

The resulting model after the regression model was of the form;

$$TF = 2.21 + 0.54Int + 0.385Eff + 0.174Gov$$

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The general objective of the study was to establish the effect of reforms in custom administration system integrity, efficiency and governance on trade facilitation in Kenya. This chapter presents the summary of the study results and provides the conclusions. The recommendations made in the study are also provided with suggestions for further research being presented in the chapter.

5.2 Summary of Findings

5.2.1 Reforms in ICT Integrity and Trade Facilitation

The study established that reforms in ICT integrity had significantly and positively affected trade facilitation. The study results indicate that KRA has implemented secure access to its data and information (SAD). Study results also show that the Customs department undertakes an independent IS Audit (ISA) while KRA manages the Customs system infrastructure and system access (IMA) effectively. Similarly, findings show that the customs system has implemented a Single-Sign-On Capability (SSC) and has an intelligence gathering system.

5.2.2 Reforms in Efficiency of ICT Service Delivery and Trade Facilitation

Further, findings imply that reforms in efficiency of ICT service delivery positively and significantly influenced trade facilitation. Study results show that KRA recruits experienced staff with relevant skills in line with best practice and it effectively deploys

and manages human resources. Additionally, study findings reveal that KRA continue to use international best practices to frame the delivery, management and support of ICT services. Similarly, findings show that KRA reviews the ICT organizational structure in the spirit of getting ahead of the curve in order to assure business value and adopts and builds capacity to develop and implement SLA based service delivery support framework. Study findings also indicate that KRA exploits ITSM Tool for enhanced management of ICT services while it frequently reviews processes of ICT in line with service orientation. Additionally, the study findings reveal that KRA implements framework contracts to allow sourcing of specialized skills on need basis and develops, enhances and builds ICT skills capacity. These improvements and reforms in ICT service delivery had enabled the customs management system to facilitate trade.

5.2.2 Reforms in ICT Governance and Trade Facilitation

Reforms in ICT governance at KRA had a significant and positive effect on trade facilitation. Study results indicated that KRA has developed and implemented an ICT policy and that KRA reviews and updates procedures regularly. Moreover, findings revealed that KRA has improved IT governance by enhancing compliance to IT best practices, standards, and governance policies. Furthermore, findings indicated that KRA has decentralized ICT support staff to business functions, increased the funding of ICT, adopted and implemented ICT best practices, standards and governance policies and improved communication within ICT. These reforms in ICT governance had enabled ICT systems at KRA to improve trade facilitation.

5.3 Conclusion

From the study findings, the following conclusions are made.

- i) Reforms in ICT integrity had significantly and positively affected trade facilitation. The reforms had a positive effect on trade facilitation as they had enhanced secure access to data and information while the regular independent IS Audit (ISA) provides users with confidence that information provided is secure and cannot be used. This enables more and more traders to use the system for their clearing purposes.
- ii) Reforms in efficiency of ICT service delivery positively and significantly influenced trade facilitation. KRA had undertaken various reforms aimed at enhancing employee skill capacity, employing experienced staff with relevant skills in line with best practice, effectively deploying and managing human resources and using of international best practices to frame the delivery, management and support of ICT services. These improvements had increased the efficiency and value of the customs administration systems and hence enabling faster and easier clearing of goods.
- iii) Reforms in ICT governance at KRA had a significant and positive effect on trade facilitation. The reforms had positive effect since KRA had developed and implemented an ICT policy, reviewed and updated procedures regularly, improved IT governance by enhancing compliance to IT best practices, standards, and governance policies all of which increased the efficiency and value that the customs administration provided traders.

5.4 Recommendations

From the study findings, the following recommendations are made.

- i) First, Customs often administers the value added tax (VAT) or similar consumption taxes. Hence, effective Customs administration at the entry or exit points should be designed along with effective customs management practices. Customs initiatives, such as deferred payment of revenues, clearance on minimum information, periodic goods declarations, tariff-free policies and duty-free imports, and so on have to be carefully reviewed and integrated with any new legislation and systems upgrade. It should be clear, therefore, that the IT system should be designed to support a systems-based approach to total revenue administration at borders.
- ii) Secondly, KRA need to understand that as a complement to Customs reform, automation is an integral part of Customs modernization. However, any modernization of ICT systems should encompass the alignment of Customs procedures and documents with international standards, conventions and other instruments.
- iii) The introduction of Customs Automation by KRA should ensure that the systems it adopts are compatible with what other governmental departments and private sector stakeholders, whose activities involve Customs operations have. These stakeholders include various government agencies, importers, exporters, freight forwarders, carriers, Customs brokers, terminal operators, banks, and shipping and insurance agents. Moreover, KRA should ensure that any system upgrade is followed by trainings to all users and stakeholders.

5.5 Areas for Further Research

The study recommends further research in the following areas;

- i) The study focused on effect of reforms in custom administration system integrity, efficiency and governance on trade facilitation in Kenya. strategic security management and performance of KRA in Nairobi. The study recommends that a similar study to be conducted in other entry points that this study did not cover.
- ii) Moreover, a study on other reforms in Customs regulations and policies and how they have influenced trade facilitation should be conducted.
- iii) Lastly, a study could focus on collecting secondary data to objectively assess whether reforms in customs administration system had led to any improvements in trade in Kenya.

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Appendix I: Questionnaire to Employees of Customs Department at KRA

This Questionnaire is aimed at seeking information about ICT reforms and facilitation of trade in Kenya. You have been selected to participate in the study.

Please answer the questions by ticking or filling on the space provided.

SECTION A: GENERAL INFORMATION

1. Please indicate how long you have worked in this organization.

- Below 5 years ☐
- 5-10- years ☐
- 11-15 years ☐
- 16-20 year ☐
- Above 20 years ☐

2. Please indicate your role or level in this organization

- Employee with no management responsibility ☐
- Lower management ☐
- Middle management ☐
- Top management ☐

3. Please indicate your highest educational qualification.

- Certificate ☐
- Diploma ☐
- Undergraduate ☐
- Post graduate ☐

SECTION B: INTEGRITY OF INFRASTRUCTURE

1. Indicate the extent you agree with the following statements regarding integrity of ICT infrastructure in this organization. Use the following rating scale:

- 1- Strongly disagree 2 – Disagree 3 – Neutral
- 4 – Agree 5 – Strongly agree

Statement	1	2	3	4	5
The customs administration system has an intelligence gathering system (IGS)					

The reforms in ICT infrastructure involved installation of a Tax Management System (TMS)					
The Customs department undertakes an independent IS Audit (ISA)					
KRA manages the Customs system infrastructure And System Access (IMA) effectively					
KRA reviews and enforces ICT and Information Security Policies and Standards (ISS)					
KRA has implemented Secure Access to its data and information (SAD)					
The customs system has implemented a Single-Sign-On Capability (SSC)					
KRA has developed policies and guidelines USB usage and security (USBS).					
KRA is working towards formal ISO27001 security certification for its Customs services (ISO27)					
KRA has integrate Customs system security to Enterprise Risk Management framework (IERM)					

SECTION C: EFFICIENCY OF ICT SERVICE DELIVERY

1. Please indicate your level of agreement with the following statements on efficiency of ICT in service delivery in this organization. Use the following ratings and tick or cross where appropriate.

1- Strongly disagree

2 – Disagree

3 - Neutral

4 – Agree

5 - Strongly agree

Statement	1	2	3	4	5
KRA reviews the ICT organizational structure in the spirit of getting ahead of the curve in order to assure business value					
KRA recruits experienced staff with relevant skills in line with best practice					
KRA develops, enhances and builds ICT skills Capacity					
KRA effectively deploys and Manages Human Resources					
KRA frequently reviews processes of ICT in Line with Service Orientation					
KRA implements framework contracts to allow Sourcing of Specialized Skills on Need Basis					
KRA continue to use International best practices to frame the delivery, management and support of ICT services					
KRA adopts, build capacity to, develops and					

implements SLA based service delivery support framework					
KRA exploits ITSM Tool for enhanced management of ICT services					

SECTION D: ICT GOVERNANCE

1. Indicate the level of agreement to the following statements on ICT governance in this organization. Use the following ratings and tick or cross where appropriate

1- Strongly disagree

2 – Disagree

3 - Neutral

4 – Agree

5 - Strongly agree

Statement	1	2	3	4	5
KRA has improved IT Governance by enhancing Compliance to IT Best Practices, Standards, and Governance Policies					
KRA reviews and updates procedures regularly					
KRA adopts and implements ICT best practices, standards and governance policies					
KRA has developed and implemented an ICT policy					
KRA has decentralized ICT support staff to business functions					
KRA has increased the funding of ICT					
KRA has improved communication within ICT					

SECTION F: FACILITATION OF TRADE

1. Please indicate the extent that trade has been facilitated after the reforms undertaken in the Customs ICT system.

Performance measure	Greatly improved	Improved	Remained the same	Deteriorated	Greatly Deteriorated
Time to Clear					
Number of documents required					
Cost to clear					
Revenue collection					

‘Thank you’