

**EFFECTS OF SYSTEM AUTOMATION ON CUSTOMS PERFORMANCE
AT THE PORT OF MOMBASA IN KENYA**

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DECLARATION

This project is my original work and has not been presented for any award in any other academic or non-academic institution

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HDB335-C016-2404/2016 Signature Date

This project has been submitted for examination with my approval as the supervisor

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DEDICATION

I dedicate this project to my parents for the support they gave me financially, intellectually and psychologically as I was pursuing this research project.

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I wish to first acknowledge the Almighty God for strengthening me and making this research project a success. Great thanks and recognition also goes to my supervisor, Mr. Ben Mumia who guided me in each and every step as I was undertaking this work. For sure, the success of this project is highly attributed to his invaluable advice and encouragement.

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ACRONYMS AND ABBREVIATIONS

ANOVA	Analysis of Variance
ASYCUDA	Automated System for Customs Data
CBCD	Customs and Border Control Department
DPC	Document Processing Centre
EAC	East African Community
EACMA	East African Custom Management Act
ICT	Information and communication technology
IT	Information Technology
KPA	Kenya Ports Authority
KRA	Kenya Revenue Authority
RADDEX	Revenue Authority Digital Data Exchange
STD DEV	Standard Deviations
TD	Technological Determinism
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
UTAUT	Unified Theory of Acceptance and Use of Technology
VAT	Value Added Tax
WTO	World Trade Organization

DEFINITION OF TERMS

System automation System automation refers to investing in modern information and communication technologies in order to integrate and share information, which leads to efficient and effective systems (UNECE, 2006).

Customs performance

This refers to the level of success attained; measured by port clearance time, total costs for import- and export-related transactions, and identification and interdiction of high-risk cargo and transparency (Holloway, 2010).

Customs cargo documentation

Cargo documentation refers to the declaration documents required for customs clearance (Kenya Revenue Authority [KRA], 2017).

Customs release process

Customs release process refers to the activities that take place before cargo is cleared within customs jurisdictions at the port of Mombasa (KRA, 2017).

Customs payment systems

Customs payment systems refer to technological mechanisms put in place to facilitate payment of requisite customs revenue during clearance (KRA, 2017).

ABSTRACT

System automation is usually applied to improve customs performance. System automation plays a significant role in simplifying and harmonizing border and administrative procedures. It leads to enhanced efficiency and effectiveness in the customs system. The poor customs performance at the port of Mombasa can be attributed to lengthy procedures of customs clearance, rapid growth of container trade, frequent KRA and KPA IT system breakdown, a gate out process that is slow and slow container off-take, inadequate capacity of yards and involvement of multiple sectors in the clearance process. The study established the effects of system automation on customs performance at the port of Mombasa in Kenya. The study particularly examined the effect of automation of cargo documentation, automation of customs release process and automation of payment system on customs performance. This study was founded on the unified theory of technical acceptance and use of technology, rational expectations theory of technology adoption and technological determinism theory. The study adopted descriptive survey research design. The study's target population constituted customs officers, KPA officers, shipping agents, and cargo owners who were 124 in total. The sample size consisted of 95 respondents who were selected through stratified sampling. A pilot test was done before embarking on actual data collection activity. Content validity of research questionnaire was achieved through consultations with the supervisor. Cronbach's alpha coefficient was used to assess reliability of the research questionnaire. Self-administered semi-structured questionnaires were employed in data collection. Frequencies, percentages, means and standard deviations were the descriptive statistical tools of analysis. Inferential analysis involved correlation and multiple regression analysis. Findings of the study were presented using tables. The study found out that that improving automation of cargo documentation leads to improved customs performance ($\beta_1 = 0.276$; $p < 0.05$). It was determined that enhancing automation of customs verification leads to enhancement of customs performance ($\beta_2 = 0.313$; $p < 0.05$). It was also noted that improving automation of payment system leads to improved customs performance ($\beta_3 = 0.382$; $p < 0.05$). It was also concluded that improving system automation will lead to improved customs performance at the port of Mombasa in Kenya. It was recommended that KRA and other stakeholders at the port of Mombasa in Kenya such as KPA should improve system automation in order to enhance customs performance at the port of Mombasa in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

IT is significant in simplification and harmonization of border and administrative procedures, hence facilitating trade. It has led to automation of customs procedures such as lodging entries, validating data, controlling cargo inventory, processing goods declarations, notifying clients about release, accounting for revenue, and enforcement by customs (UNCTAD, 2006).

Applying ICT can lead to reduced waiting times at the borders and the ports, secure and appropriate fees and customs duties processing, simplification of formalities and provision of information to transport operators in time. ICT also results in reduced costs of transactions, enhanced capacities of supply and increased access to global markets (UNCTAD, 2006). ICT improves performance in revenue administration through: Provision of historical information that is readily available; reduction of expenses as well as processing errors and duration; enhancement of services to customers and voluntary compliance and consequently leading to growth revenue collected by government (Edwards-Dowe, 2008; Chatama, 2013). ICT application also diminishes the level of contact between taxpayers and staff involved in administration of revenue hence limiting any circumstances of rent seeking. Moreover, ICT is significant in facilitation of decision making (Edwards-Dowe, 2008; Chatama, 2013).

Approaches based on system automation are fundamental in achievement of tax administration efficiency (UNCTAD, 2006). Based on experiences in Ghana, Morocco, Philippines and Uganda, it is evident that computerization of customs procedures, such as Uganda's Automated System for Customs Data (ASYCUDA) in Uganda and Ghana's Trade Net, leads to improvement in revenue collection (Salehi, 2012). Between 1998 and 2002, customs revenue in Morocco increased by about 7.7%. This was attributed to increase in commercial activities and improvement in quality of declarations, increase in productivity of customs and controls that are quality (Salehi, 2012).

The application of an updated version of ASYCUDA in Benin, Botswana, Cameroon, Tanzania and Zambia was aimed at enabling importers to lodge declarations from where they are based in and limiting the piling of documents. It enabled traders to make direct inputs. In EAC, ASYCUDA and RADDEX aimed at reducing cargo clearance times and costs amongst EAC countries through provision of an information bridge that is secure and can be accessed readily by clients who are approved (USAID, 2012). Export and re-export information as well as cleared transit declarations and reconciliation of data from cargo accepted in the country of intended destination are usually conveyed through RADDE (USAID, 2012).

The CBCD discarded the semi-automated system-Boffin and implemented a web-based application-Simba 2005 System (Tradex) (KRA, 2017). The KRA document processing centre (DPC) replaced the traditional long rooms throughout Kenya. The DPC processes and validates documents online. Export or import cargo documentation, customs release and payment processes are now automated (KRA, 2017).

The registered entries are then processed electronically by customs officers, after which a DPC approval is issued. Making payments has also been automated in KRA customs services. Charges at the port of Mombasa are usually paid through deduction of the running accounts of clearing agents. Electronic supporting documents for payments are processed online as the KRA and bank systems are interlinked. Payments made online are secure owing to the use of passwords (Aeromarine Capital Group Kenya, 2018).

Performance refers to level of success achieved in an organization (Sulaiman, Yusoff, & Chelliah, 2010). According to Devinney, Yip and Johnson (2010), at least three dimensions can be used to characterize the basic aspects of customs performance. The qualitative approach of measuring performance using a Likert scale is widely used by researchers (Zehira & Yavuz, 2014). Most firms are not willing to provide critical data, such as financial data, hence performance measurement based on subjective approach is usually generally adopted by researchers (Esteve, Peinado, & Peinado, 2008). Four high level outcomes that can be used to measure customs performance are time, cost, simplification and risk (Willis, Homel & Anderson, 2010).

The costs of trade and customs document processing, duration taken in approval of documents, staff requirements in processing and handling documentation and customs services, time for clearance of cargo clearance and the amounts of stock carried by enterprises are useful indicators of performance in customs (Matsumoto & Lee, 2007). Transparency as an indicator of customs performance is relevant to both businesses and the government hence it is considered as a high level performance outcome (Holloway, 2010). Customs performance can be measured by reduction of clearance time and costs (Wei, 2013).

Customs performance at the port of Mombasa has not been satisfactory. Various instances of inefficiency have been reported. The cost of business transactions within the port of Mombasa has more than doubled due to imposition of non-tariff barriers and other complex procedures of customs administration (Mghenyi, 2017). KRA officers no longer facilitate trade. Ineffective KRA officers have led to incurrence of extra storage costs. Importers incur an unprecedented extra Sh10 million each day due to payment for cargo storage charges and extra taxes owing to the imposed non-tariff barriers (Mghenyi, 2017). Delay in container cargo clearance at the port of Mombasa is hindering trade. Clearance period is usually long and containers overstay at the port for more than 10 to 12 days (Milimu, 2015).

1.2 Statement of the Problem

System automation is usually applied to improve customs performance (Chatama, 2013). System automation plays a significant role in simplifying and harmonizing border and administrative procedures. It leads to enhanced efficiency and effectiveness in the customs system (UNCTAD, 2006). The poor customs performance at the port of Mombasa can be attributed to lengthy procedures of customs clearance, rapid growth of container trade, frequent KRA and KPA IT system breakdown, a gate out process that is slow and slow container off-take, inadequate capacity of yards and involvement of multiple sectors in the clearance process (Ruto & Datche, 2015). In the short term, barriers to trade will increase hence reducing trade transactions at the port of Mombasa. This will ultimately result in poor economic growth and development in Kenya (Mghenyi, 2017). A number of studies conducted reveal that system automation affects customs performance. James (2010) established that system automation in leads to cost reduction and

improvement in efficiency and effectiveness. Nkote and Luwugge (2010) found out that system automation by Uganda Revenue Authority leads to increased efficiency in administration of customs. A thorough review of pertinent literature revealed that few studies have been done specifically focusing on the effects of system automation on customs performance at the port of Mombasa. Moreover, no similar study has been done in Kenya. Therefore, this study established the effects of system automation on customs performance at the port of Mombasa.

1.3 Objectives of the Study

The following objectives guided the study;

1.3.1 General Objective

The general objective of this study was to establish the effects of system automation on customs performance at the port of Mombasa in Kenya.

1.3.2 Specific Objectives

- i. To assess the effect of automation of cargo documentation on customs performance at the port of Mombasa in Kenya.
- ii. To determine the effect of automation of customs release process on customs performance at the port of Mombasa in Kenya.
- iii. To establish the effect of automation of payment system on customs performance at the port of Mombasa in Kenya.

1.4 Research Questions

- i. What is the effect of automation of cargo documentation on customs performance at the port of Mombasa in Kenya?
- ii. What is the effect of automation of customs release process on customs performance at the port of Mombasa in Kenya?
- iii. What is the effect of automation of payment systems on customs performance at the port of Mombasa in Kenya?

1.5 Significance of the Study

This study's findings will be beneficial to various stakeholders. The government and policy makers will understand the importance of system automation in enhancing customs performance at the port of Mombasa in Kenya. Hence, necessary policies

might be implemented to enhance efficiency in the customs service department. The study will results will be a blue print to managers at KRA customs service department on implementation of international trade procedures and standards. The study will also fill knowledge gaps in literature on the effects of system automation on customs performance and propel further research by scholars in other ports and in different aspects of customs performance such as effectiveness in service delivery.

1.6 Scope of the study

The study was carried out to examine the effects of system automation on customs performance at the port of Mombasa. The research was conducted between the months of May 2017 and November 2017. The study's respondents were customs officers, Kenya Ports Authority (KPA) officers, shipping agents, and cargo owners.

1.7 Limitations of the Study

During collection of data, some respondents were not willing to respond to the study due to busy schedules and fear that the data collected may be used against them. However, the researcher allowed the respondents to fill in the questionnaires at their own convenient times and collected them later. The researcher also assured them that data was purely for academics, after showing them the letter of introduction.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents literature review on system automation on customs performance. The theoretical and empirical literature review as well as the resulting conceptual framework and summary of the reviewed literature are presented. Existing empirical literature is also critiqued and research gaps that the researcher sought to fill are identified.

2.2 Theoretical Review

This section reviews the unified theory of technical acceptance and use of technology (UTAUT), rational expectations theory of technology adoption and technological determinism (TD) theory.

2.2.1 Unified Theory of Acceptance and Use of Technology

In 2003, Venkatesh, Morris, Davi and Davis developed the UTAUT, after identification and review of eight theoretical models that compete (Van Schaik, 2009). The theory argues that expectations about performance and efforts determine the use of technology (Venkatesh, Thong & Xu, 2013). Performance expectancy is the belief that using a system will lead to achievement of gains in performance of tasks (Van Schaik, 2009). Research based on UTAUT has continually grown because emergence of new information technologies (Sykes, 2015; Sykes, Venkatesh & Johnson, 2014) and citizens' e-government (Chan, Thong, Venkatesh, Brown, Hu & Tam, 2010).

Information technology has penetrated many aspects of the society, and is now used in various contexts by various individuals (Venkatesh et al., 2013). Applying the UTAUT to the study, it is implied that cargo documentation, customs release process and customs payment systems have been automated with expectations of improved customs performance. This theory was the basis of conceptualizing that automation of cargo documentation, automation of customs release and automation of payment system affects customs performance at the port of Mombasa in Kenya.

2.2.2 Rational Expectations Theory of Technology Adoption

In 1989, Davis developed this theory. According to the rational expectations theory of technology adoption, much of the decisions on adoption of technology depend on the expectations of the firm expectations about its costs and benefits (Gutierrez, 2006; Au, Kauffman & Riggins, 2006). The theory is applied in examining settings of technology adoption where various parties want to align their future value expectations before making technology adoption decisions. The theory accounts for the learning and sharing of information that generally occurs between various parties in the market place and can influence clustered adoption and the overall rate of technology adoption (Au, Kauffman & Riggins, 2006).

In technology adoption issues arise in management of expenditure. The resource allocation and assurance of economic, efficient and effective undertaking of tasks needed to achieve the objectives of technology adoption should be ensured (Hollingum, 2006). The expenditure policy put in place must take into account the costs of transactions, bargaining and decisions related to adoption of technology (Rabin & Mathew, 1998). Applying the theory to the study, it is implied that the expected costs and benefits of using IT in cargo documentation, customs release process and customs payment such as sharing of information electronically influence the use of technology. This theory was the basis of conceptualizing that automation of cargo documentation, automation of customs release and automation of payment system affects customs performance at the port of Mombasa in Kenya.

2.2.3 Technological Determinism Theory

The technological determinism (TD) theory argues that technology drives change. TD alters the cultures, structures, reporting lines, norms and modes of operations of organizations, among other aspects (Adler, 2006). For example, the innovation of the personal computer has resulted in immediacy and interactive multitasking (Wood, 2004). The TD theory is founded on two main assumptions. Firstly, it is believed that the society's technical base is the important condition affecting all social existence patterns. Secondly, it is believed that change in technology is the most fundamental source of societal change (Adler, 2006).

Various social science researchers, especially organizational, have critiques the TD theory (Gitaru, 2017). The critics of TD theory contend that a given technology's

impacts primarily depend on the manner of its implementation, which is socially determined. The ever increasing use of new technologies leads to continual renewal of TD theory (Gitaru, 2017). Moreover, issues of politics, interests of various classes, pressures in the economy, academic backgrounds and user attitudes are also leading to changes in technology (Chandler, 2000). According to Misa (2009), TD has for a long time merited reflection and critique by philosophers.

Despite criticism and support by few serious thinkers, assumptions of TD still persist (Best, 2009; Hofmann, 2006; Yang, 2009). TD is a philosophical perspective which is based on the assumption that inevitable societal changes are triggered by technology hence controlling human society. Technology considered an autonomous force which operates outside the control of society (Hofmann, 2006; Leonardi, 2008; Leonardi, 2009). It is now easy to perform various transactions owing to innovations in technology (Whitey, 2000). Applying the theory to the study, it is implied that using IT in cargo documentation, customs release process and customs payment has been necessitated by the need to see changes in the way customs operations are carried out; and ultimately improve customs performance. The TD theory was the basis of conceptualizing that automation of cargo documentation, automation of customs release and automation of payment system affects customs performance at the port of Mombasa in Kenya.

2.3 Conceptual Framework

The conceptual framework is a diagrammatically shows the relationship between the predictor and outcome variables (Young, 2009). The independent variables were; automation of cargo documentation, automation of customs release process, and automation of payments system. The dependent variable was customs performance at the port of Mombasa in Kenya. The conceptual framework is shown in Figure 2.1.

of customs and traders. Moreover, the potential negative impact of physical inspection is also reduced significantly as a result of automation (UNCTAD, 2006). The first step in clearing cargo is the electronic transmission of declarations by the clearing agents to customs services, having obtained client information from clients through supporting documents. The next step is the lodging of entries against the electronically registered manifest by the shipping or airline agent (KRA, 2017).

2.4.2 Automation of Customs Release Process

Customs release process has been automated. The transmission of customs entries from DPC for verification, cargo scanning, valuation and certification are done online. Officers in charge of verification receive the customs entries online from the DPC. Goods can either go through red, yellow or green channel (KRA, 2017). For exports, a certificate of export is electronically issued after export confirmation. Cargo valuation is done, in accordance with the guidelines of the fourth schedule of EACMA and the World Trade Organization (WTO) agreement on valuation in customs valuation, using electronic systems (KRA, 2017).

2.4.3 Automation of Payment System

Payment systems for KRA facilitate various required payments at the port of Mombasa. The electronically processed payment procedures include deduction of port charges and processing of payment supporting documents. There is also linkage of KRA online system with bank system. Systems have also been put in place to ensure security of online payments. In clearing at the container freight stations, payment of charges can differ per container freight station. It could be manual or electronic. Moreover, a banker's cheque could be required or credit given. The clearing agent is issued with a gate pass in order to collect and load cargo, once charges are secured and paid (Aeromarine Capital Group Kenya, 2018).

2.4.4 Customs Performance at the Port of Mombasa in Kenya

Reduction of border clearance time, reduction of import and export transaction costs, simplification of border clearance process as well as identifying and interdicting cargo of high risk are key outcomes to measure customs performance (Willis, Homel & Anderson, 2010). Low efficiency in managing port operations, complex and cumbersome clearance procedures as well as higher costs of transport, owing to high storage costs, lead to longer port clearance times. Customs administrations should

ensure that clearance requirements are reduced and that fast and predictable release of goods is guaranteed (Bagai & Wilson, 2006). Matsumoto and Lee (2007) discussed key indicators of performance indicators useful for business and government using the international supply chain processes as points of reference.

2.5 Empirical Review

This section reviews relevant empirical studies on the effects of automation of cargo documentation, automation of customs release process and automation of payment system on customs performance. The studies reviewed were conducted in various countries of the world. Cantens, Raballand and Bilangna (2010) conducted a study on reforming customs through performance measurement in Cameroon. It was noted that there was significant reduction in corruption and clearance times significantly reduced, four months after installation of the Automated System for Customs Data (ASYCUDA). However, this study did not focus on the effect of system automation on customs performance measured by total costs for import- and export-related transactions, simplification of clearance process and identification and interdiction of cargo of high risk.

James (2010) examined the impact that automation has on KRA customs clearing procedures in Kenya. It was established that the customs department reported improvement in efficiency, effectiveness, staff skills and governance as well as cost reduction due to the use of the Trade X-Simba system. However, this study did not focus on the effect of system automation on customs performance measured by port clearance time, transparency, simplification of clearance process and identification and interdiction of high-risk cargo. Serete (2015) examined the factors that affect clearance of containerized cargo at KPA. The study found out that there is a strong positive relationship between documentation process and clearance of container cargo at KPA. It was noted that the Single Window system curbs congestion at KPA. However, this study did not focus on the effect of system automation on customs performance measured by total costs for importation and exportation transactions, transparency, simplification of the process of clearing cargo and identification and interdiction of cargo of high risk.

Akbay (2009) studied computerization of foreign trade transaction in Turkey. It was noted that to enhance efficiency, the Turkish Customs Administration (TCA)

initiated their electronic lodgment of cargo documentation program on November 2, 1999. It was established that upon implementation of the program, clearance times reduced significantly. The researcher noted that it was a clear sign that the reform eased the burden on traders between 1996-2000. However, this study did not focus on the effect of automation of cargo documentation on customs performance measured by total costs for import- and export-related transactions, transparency, simplification of clearance process and identification and interdiction of high-risk cargo.

Cheruiyot (2015) studied I-tax system and service delivery by Kenya Revenue Authority in Nairobi stations. It was noted that the perceptions of employees about technology significantly influences delivery of services to customers. It was also determined that the delivery of services to customers is improved significantly when users understand and have knowledge of the system of taxation and internet access. However, this study did not focus on the effect of automation of payment system on customs performance measured by port clearance time, total costs for import- and export-related transactions, transparency, simplification of clearance process and identification and interdiction of high-risk cargo.

Alcedo and Cajala (2015) examined the present computerization program of the bureau of customs (BOC) in Philippines, focusing on import and export transactions. It was noted that there was unanimous agreement among respondents that the perceived benefits of the BOC computerization program were attained. However, corruption was fairly eliminated. It was noted that respondents unanimously agreed that the computerization of the BOC was effective. The study also found out that import/export documentation was fairly effective. However, this study did not focus on the effect of automation of customs release process on customs performance.

Wondemagegne (2014) examined customs and revenue reforms in Ethiopia in the case of ASYCUDA++. It was noted that the adoption of ASYCUDA by Ethiopia Revenue Collection Authority (ERCA) led to simplification of the functions of the ERCA. However, this study did not focus on the effect of automation of customs release process on customs performance measured by port clearance time, total costs for import- and export-related transactions, transparency and identification and interdiction of high-risk cargo. Zhou and Madhikeni (2013) examined systems,

processes and challenges of public revenue collection in Zimbabwe. It was established that electronic revenue systems increases business efficiency hence resulting in improvements in revenue collection. However, this study did not focus on the effect of automation of payment system on customs performance measured by port clearance time, total costs for import- and export-related transactions, transparency, simplification of clearance process and identification and interdiction of high-risk cargo.

2.6 Critique of the Existing Literature Relevant to the Study

A review of relevant empirical studies has revealed that much has actually been done on the system automation and customs performance. Majority of the studies reported that automation of systems is associated with improved customs performance. The studies include those conducted by Cantens, Raballand and Bilangna (2010), James (2010) and Serete (2015). None of the studies reviewed conducted regression analysis to determine the effects of system automation. Moreover, a critical analysis of the studies reviewed reveals that no study focused on customs performance as measured by port clearance time, total costs importation and exportation transactions, transparency, simplification of the process of clearance and identification and interdiction of cargo of high risk.

Instead, the studies reviewed focused on a few aspects of customs performance such as clearance times, corruption and cost reduction as well as efficiency and effectiveness of customs administration and not as done in this study. Notwithstanding, the studies reviewed generally point to a positive relationship between system automation and customs performance. Furthermore no study reviewed specifically focusing on automation of cargo documentation, automation of customs release process and automation of payment system. All studies reviewed just focused on system automation as a whole and not on specific aspects of system automation.

2.7 Research Gaps

Cantens, Raballand and Bilangna (2010) conducted a study on reforming customs through performance measurement in Cameroon. However, the study was not conducted in Kenya. James (2010) examined the system automation in KRA customs cargo clearance. Serete (2015) examined the factors that affect clearance of

containerized cargo at KPA. A thorough review of pertinent literature revealed that no study focused on customs performance measured by port clearance time, total costs importation and exportation transactions, transparency, simplification of the process of clearance and identification and interdiction of cargo of high risk. Moreover, no similar study on effects of system automation on customs performance has been conducted in Kenya. This study therefore bridged these gaps.

2.8 Summary

According to UTAUT, expectation about performance influences the behavioral intention to use a technology. The rational expectations theory of technology adoption argues that much of the decisions on adoption of technology depend on the expectations of the firm expectations about its costs and benefits. Technological determinism theory states that technology drives change. It was established that lodging cargo documentation electronically leads to significant reduction in clearance times. It was also established that system automation in the customs leads to improvement in efficiency, effectiveness, staff skills and governance as well as cost reduction. It was noted that corruption and clearance times significantly reduce; and customs administration process is simplified when data systems in customs are automated.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section presents design of the research, the population of the study, the size of the study sample, the technique of sampling, the research instruments, pilot testing, the procedures of collecting and analysing data are presented.

3.2 Research Design

Cooper and Schindler (2008) define the research design as a statement of a study's essential elements, which provides the blue-print for collecting, measuring and analyzing data. Descriptive survey research design was used in the study. Descriptive research enables the determination, description and reporting of the actual state of behaviours, attitudes, values and characteristics among others. Descriptive research can be conducted easily and is simple (Mugenda, 2008).

3.3 Population

Ogula (2010) defines population as a group of institutions, people or objects with similar characteristics. According to Castillo (2009), the target population is the whole group of individuals or objects to which research conclusions can be generalized. As depicted in Table 3.1, the target population for this study constituted customs officers, KPA officers, shipping agents, and cargo owners working at the new terminal who were 124 in total (KPA, 2018).

Table 3.1 Target Population

Category	Target Population
Customs officers	28
Shipping agents	21
KPA officers	33
Cargo owners	42
Total	124

3.4 Sampling Frame

According to Ogula (2010), this is the complete list of the members of a population or universe from which the subjects for a study's sample is selected (Ogula, 2010; Cooper & Schindler, 2011).

3.5 Sample and Sampling Technique

Sampling is the selection of a small group of the elements of the population of the study. Sampling results in a detailed study of a small group rather than the whole of a population. This in turn leads to reduced costs associated with collecting and analysing data and greater accuracy due (Ogula, 2010). Yamane (1967) introduced a formula that is used in sample size determination. For a 95% confidence level and $e = 0.05$, the size of the sample should be determined by the formula shown in Equation 3.1.

$$n = \frac{N}{1+N(e^2)} \dots \dots \dots \text{Equation 3.1}$$

In the above formula; n is the size of the sample

N refers to the size of the population

e is the precision level.

Accordingly, the sample size is shown in Equation 3.2.

$$n = \frac{124}{1+124(0.05^2)} = 94.6565 = 95 \dots \dots \dots \text{Equation 3.2}$$

The sample size consisted of 95 respondents who were selected through stratified sampling. The number of respondents in each strata was determined using proportionate allocation. The respondents for each strata were then be selected randomly. As depicted in Table 3.2, the number of respondents for each strata determined using proportionate allocation.

Table 3.2: The Sample Size for Each Strata

Strata	Target population	Proportionate allocation formula	Size
Customs officers	28	$n_1 = \frac{28}{124} \times 95$	21.452 = 22
Shipping agents	21	$n_2 = \frac{21}{124} \times 95$	16.089 = 16

KPA officers	33	$n_3 = \frac{33}{124} \times 95$	25.282 = 25
Cargo owners	42	$n_4 = \frac{42}{124} \times 95$	32.177 = 32
Total	124	$n = \frac{124}{124} \times 95$	95

3.6 Data Collection Instruments

The study used structured questionnaires in collection of primary data for the study. It enables the collection of the required data in descriptive studies (Dawson, 2009). Questionnaires can be used to reach out to many respondents easily. A questionnaire can also accord the study's respondent sufficient time for response to the questions (Sreevidya & Sunitha, 2011).

3.7 Data Collection Procedure

A letter of introduction from the Kenya school of revenue administration was obtained before collect data commenced. A pilot study was then carried out after which the permission of the department of customs studies in the Kenya school of revenue administration at Kenya Revenue Authority for the study's data collection was sought. The local authorities were then contacted. After that, the questionnaires distributed respondents. The questionnaires were collected later, for those who could not respond immediately.

3.8 Pilot Testing

Prior to the actual activity of collecting data, a pilot test was undertaken. A pilot test refers to a study done before and that is similar to the actual study (Kombo & Tromp, 2009). A pilot study assists in the determination of the reliability of the research questionnaire and ensures its validity (Cooper & Schilder, 2011). Pilot test should entail 10% of the sample population (Kothari, 2004). This equals 10 respondents participated in the pilot study conducted at the Lunga Lunga border station in Mombasa, who did not participate in the final study.

3.8.1 Validity Test

Validity is the accuracy of the instruments used in data collection (Zikmund, Babin, Carr & Griffin, 2010). The questionnaire should correctly measure concepts or variables under study. Testing validity is instrumental in determination of the

respondents' understanding of the direction and instructions of the research questionnaire (Cooper & Schilder, 2011). Content validity of research questionnaire was achieved through consultations with the supervisor who reviewed the questionnaire and gave suggestions on content improvement (Mugenda, 2008).

3.8.2 Reliability Test

Reliability test, using the Cronbach's alpha coefficient, enabled the researcher to ascertain whether the research questionnaire yielded the same results on repeated trials (Mugenda, 2011). The Cronbach's alpha coefficient usually lies between 0 and 1. When the Cronbach's alpha coefficient is 0, it implies that the research questionnaire is not reliable at all. When the coefficient is 1, it indicates perfect reliability. The recommended threshold for reliability is a Cronbach's alpha coefficient of at least 0.7 (Sreevidya & Sunitha, 2011).

3.9 Data Analysis

This study utilized descriptive statistics for data analysis. Standard deviation, mean, frequency and percentage were the descriptive statistical tools employed in analysis. Descriptive statistics is useful for describing data the way it is and presenting data in a summarized way for more meaningful insights and interpretations of the data. Inferential statistical analysis, Pearson Product Moment correlation and multiple regression, was also conducted. The purpose of inferential analysis is to examine associations and relationships between study variables. Regression analysis is used to explain the effect of the independent variables on the dependent variable. Correlation analysis measures the direction and strength of association between variables (Sreevidya & Sunitha, 2011). The multiple regression model adopted by the study is shown in Equation 3.3.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \dots \dots \dots \text{Equation 3.3}$$

Whereby; Y represents customs performance at the port of Mombasa in Kenya

β_0 represents the y-intercept

β_1 , β_2 and β_3 represent coefficients of automation of cargo documentation, automation of customs release process and automation of payment system respectively

X_1 , X_2 and X_3 represent the independent variables

ϵ represent error term

CHAPTER FOUR

RESEARCH FINDINGS AND ANALYSIS

4.1 Introduction

In this chapter, the rate of response, the respondents' background information, the results of descriptive statistics and inferential statistical results are presented respectively. The results of descriptive and inferential analysis are based on the study's variables and objectives.

4.2 Response Rate

The researcher distributed 95 questionnaires. 95 questionnaires given to the respondents but only 70 were collected back. The response rate, which was 73.7%, was sufficient for analysis and reporting as it was above the 70% standard rate considered excellent for external validity (Kothari & Gang, 2014). Further analysis on response rate is shown in Table 4.1

Table 4.1: Response rate

	Frequency	Percent
Questionnaires duly filled and returned	70	73.7
Questionnaires not returned	25	26.3
Total	95	100

4.3 Reliability Test Results

The research questionnaire's reliability was assessed as depicted in Table 4.2.

Table 4.2: Reliability of the Research Questionnaire

Constructs	Cronbach's Alpha	Test Items
Automation of cargo documentation	0.805	4
Automation of customs release process	0.791	4
Automation of payment systems	0.893	4
Customs performance	0.876	5

The results indicated that automation of payment systems had the highest Cronbach's alpha coefficient (0.893), with 4 test items. It was noted that customs performance had the second highest Cronbach's alpha coefficient (0.893), with 5 test items. The study established that automation of cargo documentation had the second lowest Cronbach's alpha coefficient (0.805), with 4 test items. It was also noted that automation of customs release process had the lowest Cronbach's alpha coefficient (0.791), with 4 test items. This implies that the research questionnaire was reliable as all the four variables had Cronbach's alpha coefficients greater than 0.7.

4.4 Demographic Analysis

The gender, age, educational level, the roles of respondents and time the respondents had been in the organization was examined.

4.4.1 Distribution of Respondents by Gender

As depicted in Table 4.3, this study also examined the gender of respondents.

Table 4.3: Distribution of Respondents by Gender

Gender of respondent	Frequency	Percent
Female	29	41.4
Male	41	58.6
Total	70	100.0

It was established that 41 (58.6%) respondents were male while 29 (41.4%) were female. It is implied that the respondents were fairly distributed in terms of gender, as none of the two groups was below one third representation stipulated in Kenya's 2010 constitution.

4.4.2 Distribution of Respondents by Age

The study also examined their age categories. Results of analysis are shown in Table 4.4.

Table 4.4: Distribution of Respondents by Age

Age bracket	Frequency	Percent
20 to 30 years	22	31.4
31 to 40 years	19	27.1
41 to 50 years	21	30.0
Above 50 years	8	11.4
Total	70	100.0

It was found out that 22 (31.4%) respondents were aged between 20 and 30 years while 21 (30.0%) were in the age bracket of 41 to 50 years. 19 (27.1%) respondents were aged between 31 and 40 years. It was also noted that 8 (11.4%) respondents were over 50 years old. It means that most of them were aged below 40 years, meaning that they were the youth.

4.4.3 Distribution of Respondents by Educational Level

The study further sought to ascertain the educational levels of sampled respondents as revealed in Table 4.5.

Table 4.5: Highest Educational Level of Respondents

Educational Level	Frequency	Percent
Secondary	10	14.3
Post secondary	27	38.6
Graduate	33	47.1
Total	70	100.0

The study established that 33 (47.1%) respondents had attained graduate education. It was also found out that 27 (38.6%) respondents had attained post secondary education while 10 (14.3%) respondents had attained secondary education. These findings indicate that most of them had attained at least post secondary education. It is implied that the respondents' educational levels may not have had significant effect on customs performance at the port of Mombasa in Kenya.

4.4.4 Distribution of Respondents by Role in the Organization

The study also examined distribution of respondents according to the organizational roles played as depicted in Table 4.6.

Table 4.6: Role in the Organization

Position	Frequency	Percent
Customs officer	14	20.0
KPA officer	12	17.1
Shipping agent	23	32.9
Cargo owner	21	30.0
Total	70	100.0

The study findings indicate that 23 (32.9%) respondents were shipping agents. 21 (30.0%) respondents were cargo owners and 14 (20.0%) respondents were customs officers, while 12 (17.1%) respondents were shipping agents. This implies that the researcher obtained the relevant data from a fairly distributed set of respondents.

4.4.5 Distribution of Respondents by Period of Time in the Organization

The researcher also analysed the distribution of respondents according to the period of time they had stayed in their organization as depicted in Table 4.7.

Table 4.7: Period of Time in the Organization

Years	Frequency	Percent
Below 2 years	22	31.4
2 to 5 years	7	10.0
6 to 10 years	22	31.4
Above 10 years	19	27.1
Total	70	100.0

The researcher found out that 22 (31.4%) respondents had been in their organizations for less than two years and for 6 to 10 years. 19 (27.1%) respondents had been in their organizations for above 10 years while 7 (10.0%) respondents had worked in their organizations for 2 to 5 years. It means that most of them had knowledge of operations and activities at the port of Mombasa, hence they provided relevant information for the study.

4.5 Descriptive Analysis

The study also analysed the opinion of respondents using descriptive statistics. The statistics used were the means and standard deviations (Std Dev).

4.5.1 Automation of Cargo documentation

As depicted in Table 4.8, the researcher analysed the opinions of the respondents on automation of cargo documentation.

Table 4.8: Descriptive Statistics for Automation of Cargo documentation

	N	Mean	Std Dev
The transmission of declarations electronically to customs services is fast	70	3.54	1.099
The electronic lodging of entries against the manifest registered electronically is efficient	70	3.79	1.215
The electronic filing of supporting documents to support declarations is convenient	70	3.70	.998
The processing of entries electronically at the document processing centre is efficient	70	3.87	1.089

The findings indicate that the respondents agreed that the processing of entries electronically at the document processing centre is efficient (mean = 3.87; std dev = 1.089). It was agreed that the electronic lodging of entries against the manifest registered electronically is efficient (mean = 3.79; std dev = 1.215). The respondents agreed that the electronic filing of supporting documents to support declarations is convenient (mean = 3.70; std dev = 0.998). The study determined that the respondents were in agreement that the transmission of declarations electronically to customs services is fast (mean = 3.54; std dev = 1.099).

4.5.2 Automation of Customs Release Process

As shown in Table 4.9, this study also examined the opinions of the respondents on automation of customs release process.

Table 4.9: Descriptive Statistics for Automation of Customs Release Process

	N	Mean	Std. Deviation
The transmission of customs entries online from DPC for verification is fast	70	3.69	.971
The process of scanning cargo is efficient	70	3.84	1.137
Valuation of cargo with the aid of the electronic systems is fast and convenient	70	3.70	1.040
After export confirmation, the electronic issue of certificate of export is fast and convenient	70	3.84	1.016

The findings indicate that there was general agreement that the process of scanning cargo is efficient (mean = 3.84; std dev = 1.137). It was agreed that after export confirmation, the electronic issue of certificate of export is fast and convenient (mean = 3.84; std dev = 1.016). The respondents agreed that valuation of cargo with the aid of the electronic systems is fast and convenient (mean = 3.70; std dev = 1.040). There was agreement among respondents that the transmission of customs entries online from DPC for verification is fast (mean = 3.69; std dev = 0.971).

4.5.3 Automation of Payment System

The views of respondents on automation of payment system were also examined as depicted in Table 4.10.

Table 4.10: Descriptive Statistics for Automation of Payment System

	N	Mean	Std. Deviation
The electronic deduction of port charges is convenient	70	3.81	1.094
The online processing of supporting documents after payment is fast and efficient	70	3.83	1.076
The KRA online system is effectively linked with bank system to facilitate payment	70	3.96	.939
The online system of making payments at the port of Mombasa is secure and reliable	70	4.07	.953

There was agreement among respondents agreed that the online system of making payments at the port of Mombasa is secure and reliable (mean = 4.07; std dev = 0.953). The respondents agreed that the KRA online system is effectively linked with bank system to facilitate payment (mean = 3.96; std dev = 0.939). It was agreed that the online processing of supporting documents after payment is fast and efficient (mean = 3.83; std dev = 1.076). The study determined that that the respondents agreed that the electronic deduction of port charges is convenient (mean = 3.81; std dev = 1.094).

4.5.4 Customs Performance at the Port of Mombasa in Kenya

As shown in Table 4.11, the opinions of respondents on customs performance at the port of Mombasa in Kenya were also scrutinized.

Table 4.11: Descriptive Statistics for Customs Performance

	N	Mean	Std. Deviation
The time taken to clear cargo at the port of Mombasa has significantly reduced	70	3.69	.808
The total costs for import- and export-related transactions have significantly reduced	70	3.73	.883
The transparency in import- and export-related transactions at the port of Mombasa has increased	70	3.80	.910
The port clearance procedures are now simple	70	3.70	.874
The capacity for identification and interdiction of high-risk cargo at the port of Mombasa has improved	70	3.60	.730

The findings indicate that it was agreed that the transparency in import- and export-related transactions at the port of Mombasa has increased (mean = 3.80; std dev = 0.910). It was agreed that the total costs for import- and export-related transactions have significantly reduced (mean = 3.73; std dev = 0.883). The respondents agreed that the port clearance procedures are now simple (mean = 3.70; std dev = 0.874). It was agreed that the time taken to clear cargo at the port of Mombasa has significantly reduced (mean = 3.69; std dev = 0.808). There was general agreement among the respondents that the capacity for identification and interdiction of high-risk cargo at the port of Mombasa has improved (mean = 3.60; std dev = 0.730).

4.6 Inferential Analysis

Correlation and multiple regression analysis was conducted in line with the specific objectives of this study. Correlation analysis involved examining the association between the study's dependent and independent variables. Multiple regression analysis aided in examining the combined influence of the predictor variables under system automation on customs performance at the port of Mombasa in Kenya.

4.6.1 Relationship between Automation of Cargo documentation and Customs Performance

The relationship between automation of cargo documentation and customs performance at the port of Mombasa in Kenya was analysed by the researcher as revealed in Table 4.12.

Table 4.12: Correlation Analysis for Automation of Cargo documentation

		Customs performance
Automation of cargo documentation	Pearson Correlation	.313**
	Sig. (2-tailed)	.008

It was found out that there is a positive and significant association between automation of cargo documentation and customs performance at the port of Mombasa in Kenya ($r = 0.313$; $p < 0.01$). It is implied that improved automation of cargo documentation of cargo is associated with improved customs performance and vice-versa.

4.6.2 Relationship between Automation of Customs Release Process and Customs Performance

As shown in Table 4.13, the researcher analysed the association between automation of customs release process and customs performance at the port of Mombasa in Kenya.

Table 4.13: Correlation Analysis for Automation of Customs Release Process

		Customs performance
Automation of customs release process	Pearson Correlation	.423**
	Sig. (2-tailed)	.000

It was determined that there is a positive and significant association between automation of customs release process and customs performance at the port of Mombasa in Kenya ($r = 0.423$; $p < 0.01$). It means improved automation of customs release process is associated with improved customs performance and vice-versa.

4.6.3 Relationship between Automation of Payment System and Customs Performance

As depicted in Table 4.14, the researcher analysed the relationship between automation of payment system and customs performance at the port of Mombasa in Kenya.

Table 4.14: Correlation Analysis for Automation of Payment System

		Customs performance
Automation of payment system	Pearson Correlation	.510**
	Sig. (2-tailed)	.000

It was noted that a positive and statistically significant association exists between automation of payment system and customs performance at the port of Mombasa in Kenya ($r = 0.510$; $p < 0.01$). It means improved automation of payment system is associated with improved customs performance and vice-versa.

4.6.4 Multiple Regression Analysis

The study analysed the combined effect of automation of cargo documentation, automation of customs release and automation of payment system on customs performance at the port of Mombasa in Kenya as revealed in Table 4.15.

Table 4.15: Multiple Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.772 ^a	.596	.578	.37802

a. Predictors: (Constant), Automation of payment system, Automation of customs release , Automation of cargo documentation

b. Dependent Variable: Customs performance

It was found out that the relationship between system automation and customs performance at the port of Mombasa in Kenya there is positive and strong ($R = 0.772$). The findings indicate that 57.8% of the variation in customs performance at the port of Mombasa can be attributed to automation of payment system, automation of customs release and automation of cargo documentation ($R^2_{adj} = 0.578$). This implies that system automation determines customs performance at the port of Mombasa in Kenya. However, the error of the model in predicting financial performance is 0.37802.

The researcher also scrutinized the fit of the multiple regression model for the data collected. According to Lind, Marchal and Wathen (2012), the global test is conducted to find out whether the predictor variables have zero coefficients of regression. It was therefore necessary to conduct regression ANOVA as depicted in Table 4.16.

Table 4.16: Results of ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	13.908	3	4.636	32.442	.000 ^a
Residual	9.432	66	.143		
Total	23.339	69			

- a. Predictors: (Constant), Automation of payment system, Automation of customs release, Automation of cargo documentation
- b. Dependent Variable: Customs performance

The researcher found out that there is a statistically significant relationship between system automation and customs performance at the port of Mombasa ($F = 32.442$; $p < 0.05$). The study therefore rejected the null hypotheses that all the coefficients of regression in the population are zero and accepted the alternative hypothesis that not all regression coefficients are zero in the population ($F = 32.442$; $p < 0.05$). The implication of the results of ANOVA is that the regression model was a good fit for the data. Furthermore, emphasis should be placed on automation of payment system, automation of customs release and automation of cargo documentation as they positively affect customs performance.

The null hypotheses for each predictor variable that the regression coefficients (B) in the population are zero was also tested. This was possible through t-test which examines the statistical significance of the regression coefficient of each predictor variable as revealed in Table 4.17.

Table 4.17: Evaluating Individual Regression Coefficients

	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	-.005	.381		-.013	.990
Automation of cargo documentation	.276	.051	.427	5.381	.000
Automation of customs release	.313	.055	.447	5.663	.000
Automation of payment system	.382	.056	.536	6.801	.000

a. Dependent Variable: Customs performance

The findings indicate that automation of cargo documentation significantly predicts customs performance ($t = 5.381$; $p < 0.05$). The null statistical hypothesis that automation of cargo documentation has no statistically significant relationship with customs performance at the port of Mombasa in Kenya was rejected. Therefore, a significant relationship exists between automation of cargo documentation and customs performance at the port of Mombasa in Kenya. These findings concur with findings of a study by Serete (2015) which noted that there is a strong positive relationship between documentation process and clearance of container cargo at KPA. The findings also agree with findings of a study by Akbay (2009) which noted that with the electronic lodgment of cargo documentation program, clearance times reduced significantly in Turkey.

It was determined that automation of customs release significantly predicts customs performance ($t = 5.663$; $p < 0.05$). The null statistical hypothesis that automation of customs release has no statistically significant relationship with customs performance at the port of Mombasa in Kenya was rejected. Therefore, a significant relationship exists between automation of customs release and customs performance. These

findings agree with the findings of a study by James (2010) which established that the customs department reported improvement in efficiency, effectiveness, staff skills and governance as well as cost reduction due to the use of the Trade X-Simba system.

It was established that automation of payment system significantly predicts customs performance ($t = 6.801$; $p < 0.05$). The null statistical hypothesis that automation of payment system has no statistically significant relationship with customs performance at the port of Mombasa in Kenya was rejected. Therefore, a significant relationship exists between automation of payment system and customs performance at the port of Mombasa in Kenya. These findings agree with study findings of Wondemagegne (2014) in Ethiopia which noted that the adoption of ASYCUDA by Ethiopia Revenue Collection Authority (ERCA) led to simplification of the functions of the ERCA. The findings also agree with study findings by Zhou and Madhikeni (2013) which noted that electronic revenue systems increases business efficiency hence resulting in improvements in revenue collection in Zimbabwe.

The results of the t-test of individual regression coefficients clearly depict that the three independent variables and the constant would be included in the regression equation as they were significant ($p < 0.05$). The regression function shown in Equation 4.1 was used to explain the results of multiple regression analysis.

$$Y = -0.005 + 0.276X_1 + 0.313X_2 + 0.382X_3 \dots \dots \dots \text{Equation 4.1}$$

The findings indicate that improving automation of cargo documentation by 1 unit enhances customs performance by 0.276 unit. It was determined that improving automation of customs release by 1 unit enhances customs performance by 0.313 unit. The study also determined that improving automation of payment system by 1 unit enhances customs performance by 0.276 unit.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the summary the major findings of the study, the conclusions, the recommendations and suggestions for future research are presented.

5.2 Summary

This section summarizes the major findings of this study that was conducted at the port of Mombasa in Kenya. The results relate to the three variables under systems automation and customs performance, automation of customs release and automation of payment system on customs performance

5.2.1 Automation of Cargo documentation and Customs Performance

The study established that there was agreement among respondents that the processing of entries electronically at the document processing centre is efficient. It was agreed that the electronic lodging of entries against the manifest registered electronically is efficient. The respondents agreed that the electronic filing of supporting documents to support declarations is convenient. The study established that the respondents were in agreement that the transmission of declarations electronically to customs services is fast. The study determined that automation of cargo documentation positively and significantly affects customs performance at the port of Mombasa in Kenya ($r = 0.313$; $p < 0.01$). It was determined that improving automation of cargo documentation leads to improved customs performance ($\beta_1 = 0.276$; $p < 0.05$).

5.2.2 Automation of Customs Release and Customs Performance

It was determined that there was general agreement that the process of scanning cargo is efficient. It was agreed that after export confirmation, the electronic issue of certificate of export is fast and convenient. The respondents agreed that valuation of cargo with the aid of the electronic systems is fast and convenient. There was agreement among respondents that the transmission of customs entries online from DPC for verification is fast. The study determined that automation of customs release process positively and significantly affects customs performance at the port of

Mombasa in Kenya ($r = 0.423$; $p < 0.01$). It was determined that enhancing automation of customs verification leads to enhancement of customs performance ($\beta_2 = 0.313$; $p < 0.05$).

5.2.3 Automation of Payment System and Customs Performance

The study found out that the respondents agreed that the online system of making payments at the port of Mombasa is secure and reliable. The respondents agreed that the KRA online system is effectively linked with bank system to facilitate payment. It was agreed that the online processing of supporting documents after payment is fast and efficient. The study determined that the respondents agreed that the electronic deduction of port charges is convenient. It was noted that automation of payment system positively and significantly affects customs performance at the port of Mombasa in Kenya ($r = 0.510$; $p < 0.01$). The study also determined that improving automation of payment system leads to improved customs performance ($\beta_3 = 0.382$; $p < 0.05$).

5.2.4 Customs Performance

The study established that it was agreed that the transparency in import- and export-related transactions at the port of Mombasa has increased. It was agreed that the total costs for import- and export-related transactions have significantly reduced. The respondents agreed that the port clearance procedures are now simple. It was agreed that the time taken to clear cargo at the port of Mombasa has significantly reduced. There was general agreement among the respondents that the capacity for identification and interdiction of high-risk cargo at the port of Mombasa has improved

5.3 Conclusions

There are several conclusions that were made in respect of the study findings and in line with study objectives. This study concluded that automation of cargo documentation positively and significantly affects customs performance at the port of Mombasa in Kenya. It was also concluded that automation of customs release positively and significantly affects customs performance at the port of Mombasa in Kenya. The researcher also concluded that automation of payment system positively and significantly affects customs performance at the port of Mombasa in Kenya. It

was also concluded that improving system automation will lead to improved customs performance at the port of Mombasa in Kenya.

5.4 Recommendations

The researcher made a number of recommendations. Firstly, this study recommends that KRA and other stakeholders at the port of Mombasa in Kenya such as KPA should enhance the automation of cargo documentation in order to improve customs performance. Secondly, this study recommends that the automation of customs release should be improved in order to enhance customs performance. Thirdly, the researcher recommends that automation of payment system should be enhanced in order to improve customs performance.

5.5 Suggestions for Further Studies

The study puts forth two suggestions for future research. Firstly, a study should be conducted on the effect of system automation on effectiveness of delivery of customs services in Kenya. Secondly, a study should be conducted to determine the problems facing the system automation at the port of Mombasa in Kenya.

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APPENDICES

Appendix I: Introduction Letter



Kenya School of Revenue
Administration



KENYA REVENUE
AUTHORITY

ISO 9001:2015 CERTIFIED

KRA/KESRA/MSA/002

09th October, 2017

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: ESTHER LUNDE NGANDA (ADM NO. HDB335 – C016 – 2404/2016)

This is to confirm that the above named is a bona fide student of the Kenya School of Revenue Administration (KESRA), Mombasa Campus, pursuing a Postgraduate diploma in Customs Administration.

Esther is in her final semester and is conducting a research project titled “*Effects of System Automation on Customs Performance at the Port of Mombasa in Kenya.*” Presently, she is in the process of gathering data and thereafter, write her project that will **STRICTLY** be used for **ACADEMIC PURPOSES ONLY.**

Regarding this issue, the School would like to seek your permission to allow her collect information that relates to her research from your organization.

Thank you in advance for your support and cooperation.

Yours sincerely,

Mutuvi Masila,
Ag. Principal – KESRA, Mombasa Campus.



Tulipe Ushuru Tujitegeme!



Appendix II: Research Questionnaire

This research questionnaire is designed to collect data for an academic study entitled “*effects of automation on customs performance at the port of Mombasa in Kenya*”. You are kindly requested to follow instructions in each section and provide answers to the questions posed.

Questionnaire number

Section A: General information

Kindly put a tick (✓) against the correct choice in the spaces provided

1. What is your gender? Male Female
2. Kindly indicate your age bracket?
Below 20 years 21-30 years 31-40 years 41-50 years
Above 50 years
3. What is your highest level of education?
Primary Secondary Post-secondary Graduate
Post graduate Specify any other
4. Kindly indicate your role in the organization.
Customs officer KPA officer Shipping agent Cargo owner
5. For how long have you been working in this organization?
Below 2 years 2-5 years 6-10 years Above 10 years

Section B: Automation of cargo documentation

You are requested to indicate the level to which you agree or disagree with the statements in the table below using the following 5-point Likert scale that is adopted by the study: Strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Kindly put a tick (✓) against the correct choice.

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1.The transmission of declarations electronically to customs services is fast					
2.The electronic lodging of entries against the manifest registered electronically is efficient					
3.The electronic filing of supporting documents to support declarations is convenient					
4.The processing of entries electronically at the document processing centre is efficient					

Section C: Automation of customs release process

You are requested to indicate the level to which you agree or disagree with the statements in the table below using the following 5-point Likert scale that is adopted by the study: Strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Kindly put a tick (✓) against the correct choice.

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1.The transmission of customs entries online from DPC for verification is fast					
2.The process of scanning cargo is efficient					
3.Valuation of cargo with the aid of the electronic systems is fast and convenient					
4.After export confirmation, the electronic issue of certificate of export is fast and convenient					

Section D: Automation of payment system

You are requested to indicate the level to which you agree or disagree with the statements in the table below using the following 5-point Likert scale that is adopted by the study: Strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Kindly put a tick (✓) against the correct choice.

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1.The electronic deduction of port charges is convenient					
2.The online processing of supporting documents after payment is fast and efficient					
3.The KRA online system is effectively linked with bank system to facilitate payment					
4.The online system of making payments at the port of Mombasa is secure and reliable					

Section E: Customs performance

You are requested to indicate the level to which you agree or disagree with the statements in the table below using the following 5-point Likert scale that is adopted by the study: Strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Kindly put a tick (√) against the correct choice.

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1.The time taken to clear cargo at the port of Mombasa has significantly reduced					
2.The total costs for import- and export-related transactions have significantly reduced					
3.The transparency in import- and export-related transactions at the port of Mombasa has increased					
4.The port clearance procedures are now simple					
5.The capacity for identification and interdiction of high-risk cargo at the port of Mombasa has improved					

THANK YOU FOR YOUR TIME AND COOPERATION!

Appendix III: The Work Plan

Monthly Activity	July 2018	August 2018-Jan 2020	February 2020	March 2020
Topic identification				
Problem statement				
Literature review				
Proposal defense				
Corrections & amendments				
Pilot study				
Collection of data				
Data coding, entry and cleaning				
Data analysis				
Report writing				
Research project defense				
Journal publication				

Appendix IV: The Proposed Budget

Activities	Estimated Total cost (Kshs)
Literature review	10,000
Development of draft instruments	5,000
Proposal defense	5,000
Pretesting draft instruments	5,000
Actual study's field work	25,000
Writing of draft report	5, 000
Defense of research project	10,000
Publishing research report	25,000
	80,000