

**EFFECTS OF AUTOMATED CUSTOMS SYSTEMS ON VOLUME OF TRANSIT
TRADE ALONG THE NORTHERN CORRIDOR IN KENYA**

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DECLARATION

I declare that this project is my original piece of work and has never been submitted by another person for any academic award.

Signed**Date:.....**

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HDB335 C016-4452/2016

CERTIFICATION

I confirm to you that the work reported in this project was carried out by the student under my supervision.

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DEDICATION

I dedicate this piece of work to my dear parents Mr. & Mrs. Wanjau and my siblings Alex and Anne.

My God bless you all.

ACKNOWLEDGEMENT

I sincerely appreciate the following individuals for their contributions towards the success of my study. The almighty God for granting me grace, wisdom, strength and determination throughout the study. The Kenya School of Revenue Authority (KESRA) for granting me the permission to conduct the study. My supervisor Mr. Namutula, for his great support and professional guidance offered during the whole session of the study until its completion to the required standards. My dear family who all through gave me the moral support and finances needed thus, making it a success.

LIST OF ABBREVIATION

ACS	: Automated customs systems
ASYCUDA	: Automatic System for Customs Data
EAC	: East Africa Community
EACCMA	: East Africa Community Customs Management Act
ECTS	: Electronic Cargo Tracking System
GPRS	: General Package Radio Service
GPS	: Global Positioning System
ICD	: Inland Container Depot
ICT	: Information Communication Technology
ICMS	: Integrated Customs Management System
IDF	: Import Declaration Form
KENTRADE	: Kenya Trade Network Agency
KNESWS	: Kenya electronic Single Window System
KPA	: Kenya Ports Authority
KRA	: Kenya Revenue Authority
NCTTCA	: Northern Corridor Transit and Transport Authority
NTC	: Northern Transport Corridor
RARMP	: Revenue Authority Reforms & Modernization Program
RECTS	: Regional Electronic Cargo Tracking System
RFID	: Radio Frequency Identification
RKC	: Revised Kyoto Convention
WCO	: World Customs Organization
WTO	: World Trade Organization

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DEFINITION OF TERMS

ECTS - a system that has enabled real-time monitoring of goods in transit (KRA, 2014)

Simba System-a cargo clearance system used by the Kenya Revenue Authority (KRA, 2005)

Single Window System – a system that allows traders to lodge standardizes information and documents with a single body to fulfill all import, export, and transit related regulatory requirements. (WCO, 2011)

Transit trade – trade arising from the passage of goods through one country or region to another (EACCMA, 2004)

ABSTRACT

Customs is tasked with the role of facilitating all forms of international trade including transit trade by ensuring it provides accurate, predictable and speedy movement of goods across the border. This entails modernization and automation of processes through the adoption of several systems such as Simba System, Single Window System and ECTS. The purpose of the study was to establish the effects of automated customs systems on volume of transit trade along the Northern Corridor in Kenya. The study explored a descriptive design with the target population of the study involving customs officials, clearing agents and transporters of transit goods along the Northern Corridor in Kenya. The sample size of the study constituted 85 respondents. Primary data from respondents was collected through the use of self-administered questionnaires and analyzed using the Statistical Package for Social Scientists (SPSS). The response rate was 70.5% which was considered adequate for the purpose of the study. The findings were presented in bar charts, tables and figures. From analysis, the findings showed that automated customs systems had significant effect on volume of transit trade along the Northern Corridor. Single window system had a significance level of 0.002 with a paired t-test of 3.211. Simba system had a significance level of 0.000 with a paired t-test of 6.897. The ECTS had a significance level of 0.002 with a paired t-test of 3.112. Therefore, based on these findings, the government should enhance capacity building for clearing agents and customs officials to be up to date with this technological advancement in order to improve efficiency and effectiveness in the transit cargo chain.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Globally, transit trade is an important element in a country's economic growth. It accounts for a substantial portion of foreign trade and it enables goods to move more freely making customs clearance formalities more accessible through the suspension of duty and taxes applicable to goods imported into a transit country (European Communities, 2001). As a result, revenue authorities pay very close attention on transit trade in order to ensure that the goods are not diverted into the local market. Customs is tasked with the role of facilitating all forms of international trade including transit trade by ensuring it provides accurate, predictable and speedy movement of goods across the border. This has therefore called for customs to effectively use ICT to support transit trade through the automation of its processes.

Automated systems in Customs are one of the most important tools for simplifying international trade procedures (OECD, 2005). They replace the manual processing of customs documents and thus help facilitate trade through the normalization of forms and documents, data standardization, simplification and computerization of customs clearance procedures to accelerate the clearance of goods. This has enabled customs to comprehensively manage the transit cargo clearance processes right from the manifest lodgment way before the cargo arrives to maintaining a full history of the transit cargo for audit, bond cancellation and cargo reconciliation purposes. In turn, the waiting time at border and port has reduced, securing of appropriate processing fees and customs duties, simplified formalities and provide timely information to transport operators. It has also reduced the transaction costs, enhance supply capacities and increase global market access (UNCTAD, 2006).

1.1.1 Automated Customs Systems (ACS)

Customs automation is the application of information and communication technology (ICT) in accomplishing customs processes. It is an integral part of customs modernization (Cavusgil, 1994). Complete ACS supports the entire clearance process right from lodging, acceptance and processing of cargo and goods declaration for import, export and transit, payment of applicable duties and taxes, release of the goods and monitoring for the transit goods. The idea of automation was developed by the WCO under the Revised Kyoto Convention (RKC) which is the generally accepted reference point for the key principles of customs modernization (Honohan, 2003). The concept is gaining increased attention among many customs administrations across the world as well as businesses seeking efficiency.

An automation element has been included in 24 out of 27 technical assistance projects with customs components in the World Bank during 1994-2002 (World Bank, 2005). According to the World Customs Journal (Volume 1, Number 1), technology will continue to be a significant driver of customs reform in the years to come. According to WTO Trade Policy Reviews (2000-2005), most WTO countries, including the least developed countries, have established ACS despite the different degree of development and coverage. Automatic System for Customs Data (ASYCUDA) which was developed and maintained by UNCTAD has been installed in over 80 developing countries as of 2005. Many countries around the world have either partly or fully implemented systems for customs declaration, while for others they are in the process of automating. Hong Kong, Japan, Korea, New Zealand, Philippines, Singapore, Sweden and Thailand are some examples.

The Kenya Revenue Authority initiated a reform known as the Revenue Administration Reform and Modernization Program (RARMP) which commenced in 2004/2005 with the objective of transforming KRA into a modern, fully integrated and client-focused organization. In order to

achieve its objective, RARMP adopted project management and came up with various projects among them the Customs Reform & Modernization Project which aims at transforming the customs service department into a modern customs administration in accordance with the appropriate WTO agreements and the WCO Revised Kyoto Convention. This entails modernization and automation of processes through the adoption of several systems such as Simba System, Single Window System and ECTS.

1.1.1.1 Single Window System

A single window is a system that allows traders to lodge information with a single body to fulfill all import or export related regulatory requirements (UNECE, 2002). Stakeholders involved in trade and the transport industry lodge standardized information and documents electronically with a single entry point to fulfill all import, export and transit related regulatory requirements. It is a customs pre-clearance business system that helps address the challenge of inefficiency, lengthy and slow trade procedures that results in to high cost of doing business. The processes involved include the application of permits and licenses, application for Import Declaration Form (IDF) and lodgment of impending arrival reports.

In Kenya the single window is known as the Kenya Electronic Single Window System(KNESWS). It was launched in May 2014 and is implemented by the Kenya Trade Network Agency (KENTRADE) which was established in 2011. They help facilitate international trade by reducing delays and lowering cost associated with clearance of goods by providing a single portal for clearance of goods at the Kenyan borders while maintaining the requisite control and collection of levies, fees, duties and taxes where applicable on import/export/transit. The system brings together about 41 stakeholders organizations which includes 30 partner states government agencies (PGSs) that are involved in the cargo clearance and transport business.

The system provide an electronic platform for submission, receipt and processing of transit trade related documents that are required in order for the transit cargo to be able to transit through Kenya from the port of Mombasa all the way to the Kenya – Uganda border. It's through the system that necessary cargo clearance information is exchanged among the many stakeholders involved and thus help save on time as well as cost thus help reduce the time taken to clear the transit good to proceed to their final destination. The transit cargo dwell time at the port of Mombasa has been reduced from 8 days to a maximum of 3 days.

1.1.1.2 Simba System

Simba System is an internet based customs IT system dubbed 'Simba 2005 System' that was borrowed from The Senegalese Customs department system known as GAINDE 2000. It acquisition was initiated in 2002 but finally came into us in July 2005. It has been at the centre of customs modernization and has enabled the automation of about ninety percent of customs operations. Simba System is a cargo clearance system and it has been integrated with other customs system thus helping revolutionize the conduct of customs businesses. This has improved customs processes and procedures allowing for less paperwork and thus faster clearance thus saving not only money but also time in business transaction.

The system is composed of several modules which include: TRADE X which is the customs clearance module, LUEK that provides customs agents and ship agents with on-line regulatory information including tariff research, PAYBOX module that provide on-line contacts between banks and customs and the ORBUS module that facilitate electronic contact between customs and clearing agents, ship agents carriers as well as regulatory government agencies.. The system operates on a multiple of sub-system and required multiple points of authentication for users. Therefore, the system is under the process of upgrading into a more user friendly system known as Integrated Customs Management System (ICMS) which runs on a single system where all

business processes will be implemented into one system to support efficient clearance of cargo. ICMS is still being piloted and once it's in full operation it will be able to merge and exchange customs declaration information with the Automated System for Customs Data (ASYCUDA) operated by other EAC member states.

1.1.1.3 Electronic cargo tracking system (ECTS)

ECTS is a web-based integrated system developed to electronically monitor goods under transit control as it moves along the Northern Corridor supply chain that is Kenya, Uganda and Rwanda. It offers real-time cargo tracking that helps in knowing the exact location of cargo consignments along the supply chain hence enhancing cargo security while facilitating efficiency and effectiveness in trade. It was introduced to curb transit diversions into the local market. Prior to its implementation, KRA used physical human escorts to escort the transit cargo from the port of Mombasa all the way to the Kenya-Uganda border.

ECTS technology become available in the early 2004, but it was only in April 2010 that the Kenyan government introduced the mandatory installation requirements and Uganda followed in November 2013. Currently, the system has been upgraded to include three of the Northern states i.e. Kenya, Uganda and Rwanda who operates an integrated cargo monitoring unit commonly referred to as RECTS (Regional Electronic Cargo Tracking System). It enables them to have joint monitoring of the transit goods within the region. The system helps customs and private transporters monitor movement of transit goods and prevent transit cargo theft and dumping while enhancing fair terms of trade.

The system uses Radio-frequency identification (RFID) and GPS/GPRS technology. All trucks, tankers and container carrying transit goods are fitted with a tracking device and an electronic seal which sends the seal status, truck location and any violation to KRA on a real time basis. Its main components include a tracking reader (GRS receiver, RDIF reader & GPRS/GSM modem),

mechanicals for hatches and valves (wet cargo), ECTS software platform and an electronic seal (e-seal). An e-seal is an intelligent gadget which signals its presence and communicates with a tracking reader using the Radio Frequency Identification- RFID technology.

1.1.2 Northern transport corridor (NTC)

Northern Corridor is a multimodal transport route in east and central Africa, providing a gateway to landlocked Uganda, Rwanda Burundi, Southern Sudan and Democratic Republic of Congo (DRC) with the Kenya's maritime port of Mombasa. The connection is through a road network, railway, inland water routes, Inland Container Depots (ICDs) and pipelines. According to a statistics collected by the Kenya Ports Authority (KPA) showed that traffic for goods on transit to the port of Mombasa which is the main hinterland of the East African region significantly been on the raise from 7.19 million tonnes in year 2014 to 7.66 million tonnes in the year 2015 this illustrates an 8.2 per cent growth (Odhiambo, 2016).

The Northern transport corridor is managed by Northern Corridor Transit and Transport Coordination Authority (NCTTCA) that is mandated by the member states to oversee the implementation of Northern Corridor transit and transport agreement (NCTTA). Prior to the treaty, transit trade operated on the basis of bilateral agreements, which did not offer a coherent framework for standardized services and transit trade procedures across the different member states territories. It was contacted with the objective of simplifying and harmonizing procedures relevant to the expeditious movement of goods in transit.

1.1.3 Transit trade

Transit trade is defined as the trade arising from the passage of goods through one country or region to another through a transit country (EACCMA, 2004). It may involve one border crossing or several border crossing and hence the trade does not only matter for landlocked countries but

concerns all trade transiting through third countries (Arvis et al., 2008). It is vital in facilitating economic transformation and regional trade, while contributing to the growth of employment, incomes, tax revenues, and directly to improving the balance of payments through export of services. Growth of transit trade enhances growth of business across the various sub-sectors of the logistics industry, and generates pressure for the country to improve its trade facilitation, such that the increased efficiency benefits the wider economy.

Transit systems consist of infrastructure, legal framework, institutions, procedures, and any other elements governing the movements of transit goods and traffic (Arvis, 2011). A functional transit system is essential for trade connectivity within region. The NCTTCA facilitates along the corridor through the removal non-tariff barriers to trade thus reducing the cost of doing business. This helps promote the implementation of international and regional treaties, laws and agreements geared towards trade and transport facilitation. Transit controls are generally implemented to ensure compliance with national Customs legislation and regulations.

1.2 Statement of the problem

Over the years, there have been increased demands for facilitation of transit trade through the reduction of non-tariff barriers and review of customs business processes. According to the World Bank annual Doing Report of 2015, it highlights that in Africa it takes three times as many days, twice as many documents and six times as many procedures in comparison to the high income economies (Djankov et al.2010).Increase in trade volumes and trade complexity have amplified demands on Customs administrations to address inefficiencies of outdated modes of operation (KAM, 2007).

In Kenya, Customs clearance is a mandatory requirement for all imports, exports and transit cargo. The port of Mombasa is a critical nerve Centre of doing business serving the East and Central Africa region, given that a number of countries in this region are landlocked. They are linked

through the 'Northern transit corridor' from Kenya through Southern Sudan, Uganda to Rwanda to Burundi and Congo that serves as a primary transit route for all the countries. Over the last ten years, traffic through the Port of Mombasa has increased by 7.1 percent per annum, rising from 14.419 million tons in 2006 to 26.73 million tons in 2015. About 70 percent of the ports traffic is destined to the local market with the rest shared between Uganda, Rwanda, Burundi, Tanzania, Democratic Republic of Congo, South Sudan and Somalia. Uganda is the major transit point with its traffic claiming 78 percent of transit share (Transit Market Share, 2015)

In 2004, KRA partnered with the WCO and conducted a Time Release Study, which measured the amount of time it took for cargo to be cleared through the various entry points. It was found that it took more than ten days to clear a container through the seaport of Mombasa. The increased trade volume has forced the customs department to embrace modern technology and working method in order to be more efficient in meeting the increased demand by traders for faster clearance of cargo. Customs therefore has to meet these challenges and expectations against the background of human and financial resource constraints. This has been successfully attained by synchronizations of various systems in various systems towards a common repository mapping which is a fundamental tool in automation (Dramod K, 2004)

Customs systems automation was implemented with the aim of facilitating seamless transit trade flow. The Single Window System provide an electronic platform for submission, receipt and processing of transit trade related documents necessary for cargo clearance and shares the same information with the Simba System thus allowing the necessary taxes and duties to be paid and goods cleared. Once the Simba System clear the goods for transit the system relays the information to the Electronic cargo tracking system for monitoring purposes on a real-time basis as they move along the corridor to their destination. Through this integration, customs is able to share necessary information thus reducing a lot of paper work and duplication of roles. This in turn helps

facilitating seamless transit trade with reduced diversion through the real-time monitoring as well reduced cost and time taken to clear the cargo in and out the country which was a great challenge to the partner states who heavy relies on Kenya as a transit country for their imports and exports. Many customs authorities have now fully automated their processes and have integrated their system to easy their operations. Previously, studies have concentrated on the systems independently as single system. There is no much research done on the complete automated customs systems and the effects yield by the systems when integrated together. Therefore, the research study was promoted by this gap and seeks to establish the effects customs automation systems have on volume of transit trade along the Northern corridor in Kenya.

1.3 General Objective

The main objective of the study was to establish the effects of automated customs systems on volume of transit trade along the Northern corridor in Kenya.

1.3.1 Specific Objectives

1. To establish the effects of Single Window System on volume of transit trade.
2. To establish the effects of Simba System on volume of transit trade.
3. To establish the effects of Electronic Cargo Tracking system on volume of transit trade.

1.4 Research Question

1. How does the Single Window System affect the volume of transit trade?
2. How does the Simba System affect the volume of transit trade?
3. How does the Electronic Cargo Tracking System affect the volume of transit trade?

1.5 Justification of the study

The finding of this study will benefit the stakeholders and government agencies involved in the transit trade business in Kenya. They have a better understanding on customs automated systems hence enabling them improve their operations and services. This enhances compliance on the part of the users and it also informs the government during the formulation of the relevant policies and financial support for technological advancements on customs operations.

The scholars and the academic world benefit with more reference material since the study build up on the functioning and operations of automated customs systems and also suggest areas for further research so that future scholars can pick the areas for further study.

1.6 Scope of the study

The scope of the study focused on the effect of automated customs systems on volume of transit trade along Northern Corridor in Kenya. It involved various stakeholders in the transit operations along the Northern Corridor in Kenya. It was done through the selection of a sample population to fill in the questionnaires that were analyzed.

1.7 Limitation of the study

The challenges encountered during the study included illiteracy especially from some respondents who could not understand few of the questions while some employees were on leave during the data collection period and some were too busy to fill the questionnaire while others misplaced the questionnaires given. The researcher endeavored to explain the questions to the respondents and making follow-ups without failure and issuing additional questionnaires to get more respondents.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the relevant existing literature that has been reviewed in the area of customs automation. The chapter highlights theories underpinning the study, empirical studies and conceptual framework.

2.2 Theoretical framework

Theoretical review is formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge within the limits of critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory that explains why the research problem under study exists.(Richard, 2013)

2.2.1 Technology acceptance model theory

The purpose of this model is to predict the acceptability of a tool and identify the modifications which must be brought to the system in order to make it acceptable to users. According to Davis (1986), people accept or reject a technology depending on two things i.e. the perceived usefulness and the perceived ease of use. These two beliefs lead to individual behavior intention and actual behavior. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact which it may have on his performance. The perceived usefulness as well as ease of use of the automated customs systems determines the user's willingness to adopt them.

According to French and Raven (1959), if an individual perceive that an important social actor has the ability to punish certain behavior or reward the behavior, the social influence of compliance effect will occur. With two systems offering the same features, a user will find more useful the one that he finds easier to use (Dillon and Morris, on 1996). He perceives the usefulness as the strongest

predictor of an individual's intention to use a technology. Researchers have widely used this particular model to study the adoption of various technologies thus becoming the most influential theory in the technological field.

The theory was further added into by Ventkatesh and Davis (2002), bringing on board the social influence (subjective norm, voluntariness and image) and the cognitive instrumental processes (job relevance, output quality, result demonstrability and perceived ease of use) to predict the adoption. A notable refinement of the TAM model is proposed by (McFarland and Hamilton, 2006). Their model assumes that 6 contextual variables (prior experience, other's use, computer anxiety, system quality, task structure, and organizational support) affect the dependent variable system usage through 3 mediating variables (computer efficacy, perceived ease of use and perceived usefulness).

2.2.2 Transaction Cost Theory

The transaction cost theory as advanced by Williamson (1985) proposes that if there are market based measures, business players will buy-in because a firm can benefit from economies of scale of the market place. However, McIvor (2005) assert that transaction costs are the reason behind different forms of organizing economic activity in the two ends of a continuum regarding how to administrate business in markets. Transactions and transaction cost differ between the various governance structures in business relationships and arise from four classes namely; search costs, contracting costs, monitoring costs and enforcement costs in the business transaction. The cost benefit associated with automation of systems in carrying out various functions and processes out determined the appropriateness of adoption for the automated system.

According to Aubert (2004), transaction costs represent a friction in the market or cost of using the price mechanism and states that when the marginal cost of using markets are higher than the costs of running a firm, the transaction should be organized within the firm and vice, versa. Therefore, when a firm has integrated its operational functions and strategically to organizations,

firms may better focus on their most value-creating activities, thereby maximizing the potential effectiveness of those activities.

In addition, as business activities increases, costs between cross-border activities may decline, and investments in facilities, equipments and workforce can be reduced. Further, Sauve and Zampetti (2010) observe that transaction costs of regional trade facilitation are optimized when the most appropriate participants partake in such provision (Arce&Sandler, 2002). As a result, there is need to address coordination and capacity failures, which can occur when disparate national governments independently tackle regional trade facilitation challenges

2.2.3 Institutional Theory

According to Meyer and Rowan (1977), institutional myths are merely accepted ceremoniously in order for organization to gain in the institutional environment. Peoples believe towards a certain functionalism determines their level of willingness to adopt a system .They adopt and display the organizationally acceptable to help preserve the spirit of an organization action based on good faith for survival. The theory recognizes that institutional environment can strongly influence the development of formal structures in an organization more than market pressure. Institutional theorists suggest that organizational actions and processes are driven by their actors in order to justify and plausibly explain their actions. Automated system should address the market need for their clients in order to be effectively and willing full adopted by their perceived users. KRA as an institution is charged with the mandate of training and facilitating the adoption of the automated customs systems.

Organizations adopt a standardized set of practices (Scott, 2001). According to this perspective, strategy implementation is rationally accounted for by organizational actors and rooted in the normative context Oliver et al. (2007). The institutional theory believes that organizational fields become structured by powerful influences among organizations. Legitimacy concerns lead

organizations to adopt practices that conform to the mandate of the institutional environment (Kraatz&Zajac, 2006). These institutions are also supported by the employees, and they provide both the social and the legal constructions of individual identity Friedland and Alford (1991).

2.3 Conceptual Framework

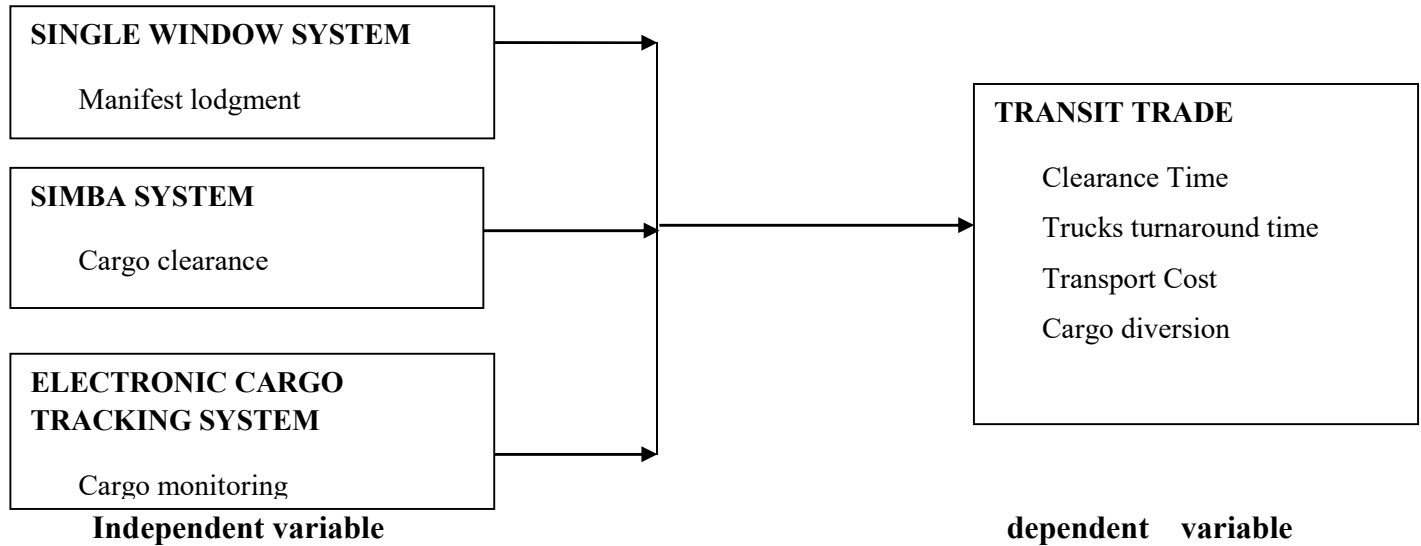


Figure 2.1: Conceptual framework

The diagram above shows the interrelationship between the independent variables and the dependent variables. The independent variables in this case are the automated customs systems that alter the volume of transit trade. The automated customs systems include; Single Window System, Simba System and Electronic Cargo Tracking System. The dependent variable for the study is transit trade. Therefore it means that the volume of transit trade depends on the effectiveness of the automated customs systems.

2.4 Empirical Review

2.4.1 Single Window System

According to the World Customs Organization (2008) survey, this computerized system has been a huge advantage for the trading community. It has speeded up the processing of trade information,

has enabled risk management especially for concerned Government agencies, has enhanced compliance in the private sector and provides better service to businesses due to efficiencies. Poor relationships between customs authorities and traders have cost implications too resulting in poor performance (Buyonge & Kireeva, 2008). Improper facilitation causes governments to lose revenues, while firms tends to incur direct costs caused by delays (demurrage charges), indirect costs due to lost business opportunities.

Kubai (2015) conducted a study on the regional trade and the single window within the EAC. The study compiled pieces of experiences from various individuals, organizations and stakeholders from the regions as well and noted that the system reduced clearance time as well as lead time thus reducing the transaction cost and demurrages emanating from delays and reduce manual applications. Hence the overall benefit is an increase in revenue collection for the local imports due to the efficiency of the system and transparency of the processes. Few challenges were as well identified whereby political will from the national governments was the most highlighted one.

According to Mwanaulu, (2016) highlighted the effect of the implementation of the Kenya National Electronic Single Window System on trade facilitation. The survey noted that the system provides a centralized portal for lodgment of trade pre-clearance documents and collection of the requisite duties and fees by government agencies. This therefore he states that the system is ideal for collection of trade statistics which are used by the government for strategic planning. The study also noted that the system provides transparency on the pre-clearance and documentation process for all stakeholders thereby reducing corruption and enhancing service delivery standards.

.2.4.2 Simba System

According to a USAID report released in 2007, it enumerated several benefits derived through application of the Simba System. The clearance lead time for export-import documents has been reduced from five days to one day; clearance times at Mombasa Port have been reduced from an

average of 17 days to between 10 and 11 days and there are perceived impact in terms of reduction of corruption. It also highlighted that Private sector users of the system report that there is less need to pay undocumented fees, as there are fewer 'officials' handling their documents and fewer documents being handled.

Kaibe, (2012) sort to establish the challenges brought about by globalization by determining how Kenya Revenue Authority has applied the Simba System to address the challenges. he found out that globalization has positively impacted Customs at the Kenya Revenue Authority, by resulting into technological advancement and automation of Customs operations, including clearance processes. In turn, there has been facilitation of international trade due to faster processing of documents, for both imports and exports. This was evidenced by the reduction in the average time taken to clear goods at the ports of entry and exit, from two to three weeks to two to three days.

Muthama, (2013) did a study on change management practices adopted by Kenya Revenue Authority in its reform and modernization programme. The objective of this study was to determine the Change Management Practices adopted by KRA. The study was conducted through a case study of KRA. It was found that there have been a lot of changes in the firm that have prompted the management to effectively manage change. New departments have been created, others merged while others split in a bid to deliver better services to clients. Similar to organizations, resistance to change was inevitable but the management was able to contain the pressures that wanted status quo to prevail.

2.2.4.3 Electronic cargo tracking system

Research has found out the reduction in customs clearance time can have a significant influence on attracting foreign investments. Djankov et al, (2006), found out that on average, each additional day that a product is delayed prior to being shipped or transported reduces trade by at least 1 percent as well as the effect on trade volume. Bhero et al. (2015) investigated the impact of a radio-

frequency identification system and information interchange on clearance processes for cargo at border posts of South Africa. The findings established that the average transit time across all cargo types is significantly reduced when they are installation of these measures.

According to Miller and Bujak (2014), the ECTS is efficient and cost effective when the transit good are monitored and recorded. The security of containers in transit is limited hence the enactment of two modes for monitoring. Real-time mode and end-to- end mode with a holistic approach that combines these functionalities using patented container security tracking technologies has improved the transport industry (Miler and Bujak, 2014).

Slack, Chambers & Johnson (2004) highlights effective management as key to reducing losses incurred by investors during transit of good. Furthermore, they describe stock taking as efficient technique that reduces the time lost and complication arising from recording. The application of information and communication technologies in the transport industry can be used to transmit signals from one place to another (Giannopoulos, 2004). Reduction in the costs associated with them movement of goods across borders and regulatory environment reforms have been cited as drivers to economic growth (university of Manchester, 2009).

Electronic commerce has been found to reduce in the time spent in doing business which results in savings. Real time reporting of incidents and on issues affecting the transporter regarding the security of transit goods (Chung 2004) has facilitated the development of ECTC. Additionally, the research by Jackson (2009) on challenges to cross border trade and investment has amplified the impact of ICT and global investments on transport. Chung (2004) can be integrated Shamsuzzoha & Helo (2011) research on real-time tracking and tracing system that increases potentials for the logistics network.

2.5 Critique of the existing literature

Previously, various studies have been reviewed in regard to customs automation. Many of the customs administrations have not yet fully automated their customs process and hence there is a hindrance to facilitation of seamless transit trade. In many countries you find that they carry some of the clearance processes manually with few processes being automated. This creates loopholes and thus some necessary information goes missing from their trade statistics in regard to volume of transit trade. The documented trade is only one that takes place within borders but not across the borders. In regard to this, studies done have focused on single customs systems for example Mwanaulu, (2016) did a study that basically focused on the Single Window System but did not include the effects associated with integrating the system with other systems that supports the transit trade. Kaibe, (2012) also did a study on Simba System but did not focus on the other systems that are integrated with the system for its effective functioning. For the customs automation process to be effective, it has to integrate all the system together in order to be able to share necessary information and reduce the duplication of work thus causing delays and high cost incurred both by the revenue authority and traders.

2.6 Summary

The review of the study has been concentrated on relevant theories and empirical studies that make an effort to establish the effects associated with having automated customs systems to clear and monitor goods on transit. Some of the effects discussed were: cargo diversion cost and time. The review has shown that there are numerous theoretical perspectives that are used to explain the topic. Transit trade is an import aspect especially to the land locks countries and hence the world has to come up with theories and necessary information to support it.

2.7 Research gap

One of the core findings is that customs administrations worldwide generally operate automated customs systems in clearance and monitoring of transit cargo. The customs administrations, however varies in the level of automation whereby some have partially automated their systems with some of them still being done manually while others have fully automated all the customs processes. Operates the systems individually through standalone platforms and hence there is no much sharing of necessary intelligent information among the customs. Therefore there is a need to do more research on the advantages or disadvantages of having a partially automated customs or fully automated customs.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was used in the study. It covers in details the research design, target population, sampling frame, sampling technique, data collection and data analysis.

3.2 Research Design

The study used a descriptive research design. A descriptive research design presents and reports things as they are (Mugenda and Mugenda, 2003). Also the design is used when the purpose of the data collected is to describe characteristics of certain goals, estimate proportions of people who behave in a certain way and make certain predictions (Kothari, 2004). According to Kombo and Tromp (2006), a research design can be regarded as an arrangement of conditions for collections in a manner that aims at combining relevance with the research purpose. The descriptive research design provided facts and suggestions on major connections between variables and their cause. This research adopted survey as a major method. Surveys were designed to fit in a questionnaire schedule. This is most commonly used technique in research (Veal, 2006).

3.3 Population of the study

Borg and Gall (1999) define a population as all the members of a real set of people, event or object to which a researcher wishes to generalize the results of a study. Mugenda and Mugenda (2003) refer to a population as the “universe”. According to Sekaran, (2010) he refers to population as the entire group of people or things of interest that the researcher aims to assess. The population of this study involved the various stakeholders who included customs officers, clearing agents, and transporters. The number of these people when put together is approximately 850. Therefore the study targeted 85 people

3.4 Sampling frame

A sampling frame describes the list of all population units from which the sample was selected (Cooper & Schindler, 2003). It is a physical representation of the target population and comprises all the units that are potential members of a sample (Kothari, 2008). A sample size may be described as elements from which data is collected (Schindler & Cooper, 2003). Kerlinger (1986),

states that a sample size of 10% of the target population is large enough. Therefore, a proportionate sample size of appropriately 850 respondents representing a 10% of the population was selected using a stratified sampling technique.

3.5 Sample size and sampling techniques

According to Keller, (2009) indicates that a sample is a set drawn from the entire population. Stratified random sampling was used since it works more effectively where the sampling frame is heterogeneous. The population was divided into small groups called strata then a systematic technique was used to select members who participated in the study to from each stratum. As Kothari (2004) expresses, a sample size between 10% and 20% is considered adequate for in-depth studies. Therefore, the sample size for this study was 10%.

Table 3.1: sample size

Stratum	Target Population	% Sample Size	Sample Size
Customs officials	100	0.1	10
Clearing agents	410	0.1	41
Transporters	340	0.1	34
Total	850	0.1	85

3.6 Data collection procedure

The research used primary sources of information to collect data. The data collected was quantitative data in order to achieve an in-depth understanding of the situation. The primary sources entailed data collection through the use of semi-structured questionnaire comprising of closed-ended questions developed in line with the objectives of the research and completed by the sampled population. The study adopted a 5-point likert-scale with the values ranging from 1-5.

Each respondent rated each item on the response scale 1= strongly agree, 2= agree, 3= uncertain, 4= disagree, 5=strongly disagree. The questionnaires were self-administered.

3.7 Data analysis

Data collected for this study was organized, summarized, presented and analysed using descriptive statistical techniques of frequencies, tabulation, pie charts and bar charts. Baker (1994) argues that descriptive statistics highlights features of a set of observation and do not support or falsify a relationship between two variables according to their numerical properties. The numerical measures of percentage and mean were also used. The Statistical Package for Social Scientist (SPSS) software was used to analyze the data. The study employed regression analysis model in data analysis. Paired T-test was used to test the significance of the regression model. The regression analysis model is given as follows:

$$Y = (B_0 + b_1X_1 + b_2X_2 + b_3X_3 + \epsilon \dots \dots \dots)$$

Y = transit trade (Clearance time, trucks turnaround time, transport cost, cargo diversion,)

X₁ = Single Window System

X₂ = Simba System

X₃ = Electronic Cargo Tracking System

b₁, b₂, b₃ are coefficient of X₁, X₂, X₃ and B₀ is an arbitrary constant

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter comprised of data analysis, presentation and interpretation of findings that are in line with the identified objectives on effects of automated customs systems on volume of transit trade along the Northern Corridor in Kenya.

4.2 Response Rate Analysis

Respondents	Administered questionnaires	Returned questionnaires	Percentage
Customs officials	10	8	80%
Clearing agents	41	33	80.5%
Transporters	34	19	55.9%
Total	85	60	70.5%

Table 4.1 Response Rate

According to table 4.1 a total of 85 questionnaires were administered but only 60 were returned comprising of 8 customs officials, 33 clearing agents and 19 transporters completely filled and returned the questionnaires. This translates to 70.5% response rate. From the table above it is clear that majority of the respondents returned their questionnaire.

4.2.1 Reliability and Validity

The study conducted a pilot test to find out the reliability of the research questions and responses were evaluated with the aim of finding out whether there were any inconsistencies in the questions with a view of establishing the degree of internal consistency of data captured by questionnaires. Validity was tested by use of Cronbach's coefficient alpha (α), and the results were as shown in table 4.2 below.

Table 4:1Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
	.867	4

As indicated by Amin (2008), the instrument is viewed as solid if the normal record is 0.70 or above. From the Table 4.2 above, it demonstrates that every one of the recognized elements; Single Window System, Simba System, electronic cargo tracking system and transit trade were 0.867

well over the lower limit of acceptability of 0.70. This means that the items in the study had high internal consistency because reliability coefficient of 0.70 or higher is considered acceptable (Kline, 1999).

4.3 Demographic analysis

This section presents personal information of the respondents who participated in the study. The characteristics discussed include gender, education level, years worked and nature of business.

4.3.1 Gender of respondents

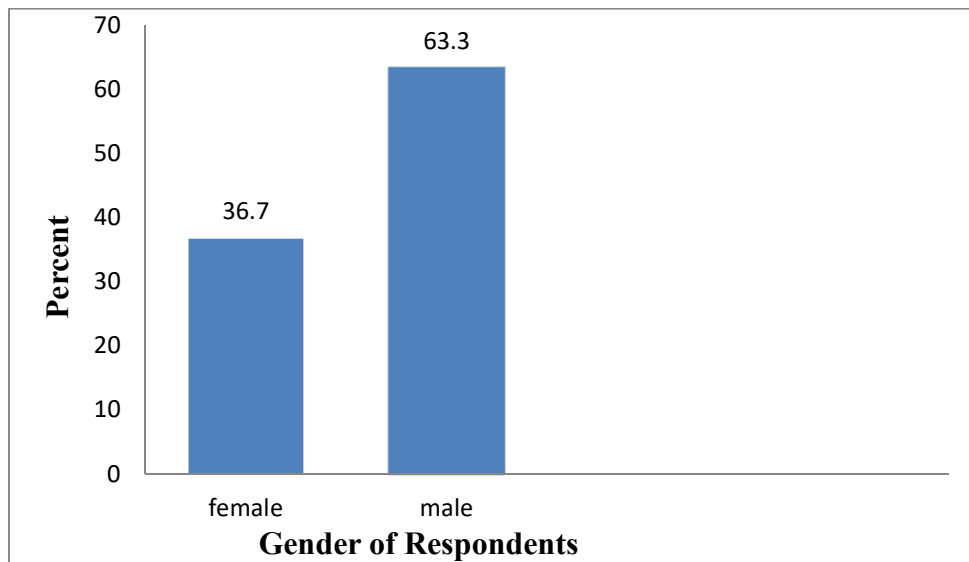


Figure 4.1 Gender of Respondent

The study found that there were more men engaging with the automated customs systems than women. Male respondents represented 63.3% of the respondents while female respondents represented 36.7% of the respondents. This means that male respondents were more than female respondents by 26.6%.

4.3.2 Education level

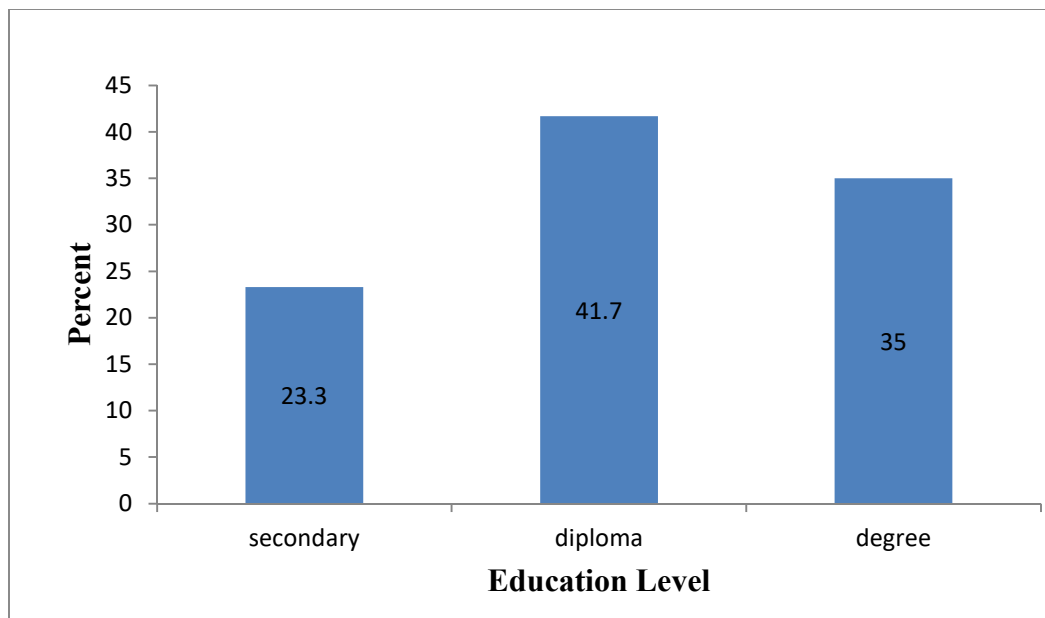


Figure 4.2 Education Level

According to figure 4.2, 35% of the respondents were university graduates, 41.7% of the respondents were from college and 23.3% of the respondents were from high school. From the study it was therefore established that most of the respondents were literate and understood the subject matter.

4.3.3 Years worked

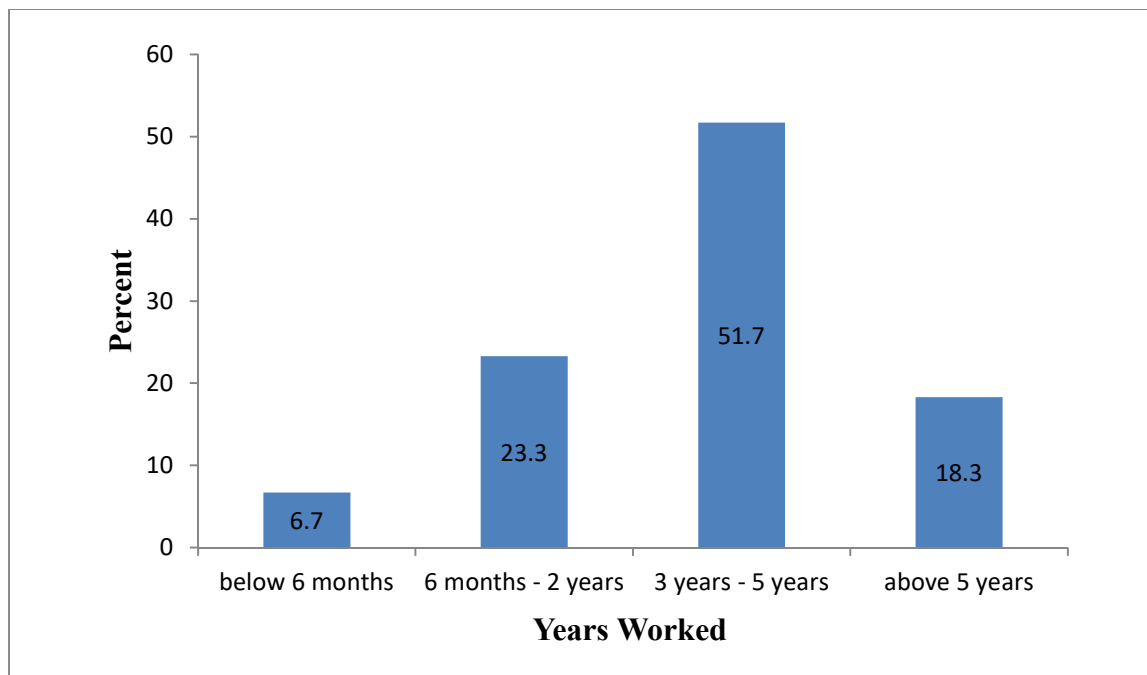


Figure 4.3 Years Worked

According to figure 4.3 6.7% of the respondents have served in the business for less than 6 months, 23.3% of the respondents have served in the business for 6 months-2 years, 51.7% of the respondents have served in the business for a period of 3-5 years and 18.3% of the respondents have served in the business for a period of more than 5 years. From the study it was therefore established that most respondents had sufficient experience in terms of knowing fully how the automated systems operates.

4.3.4 Nature of business



Figure 4.4 Nature of Business

According to the study results, 13.3% of the respondents were customs officers, 55% were clearing agents, while 31.7% were transporters. This implies that the surveyed respondents were major actors of transit trade along the Northern Corridor and therefore they were at vantage to share their views and opinions about the effects of automated customs systems on volume of transit trade along the Northern Corridor.

4.4 Descriptive Analysis

The respondents were asked to rate the extent to which they agree with the statements based on the scale options of; 1 (strongly agree) to 5 (strongly disagree). The questions were randomly arranged and were aimed at analyzing effects of; Single Window System, Simba System, and Electronic Cargo Tracking System on volume of transit trade along the Northern Corridor in Kenya. The results were summarized using mean scores, where the mean score represents the overall rating on the extent to which respondents agree with the statement.

4.4.1 Data on Single Window System

From analysis as tabulated in Table 4.3 below, results revealed that respondents agreed with mean score of 4.05 and standard deviation of .964 that with the application of Single Window System there is effective monitoring and accounting for transit cargo. The study results revealed that respondents agreed with mean score of 3.80 and standard deviation of 1.070 that with the Single Window System there is faster submission and approval of transit cargo clearance documents. Also the respondents agreed with a mean of 2.18 and standard deviation of 1.030 that with the Single Window System data duplication has been eliminated while the respondents agreed with mean score of 1.98 and standard deviation of 1.030 that there is seamless flow of data among stakeholders in the transit business with the Single Window System.

Table 4.3: Single Window System

Statement	N	Mean	Std. deviation
There is effective monitoring and accounting for transit cargo	60	4.05	.964
There is faster submission and approval of transit cargo clearance documents	60	3.80	1.070
Data duplication has been eliminated	60	1.98	1.030
There is seamless flow of data among stakeholders in the transit business	60	2.18	1.490

4.4.2 Data on the Simba System

From analysis as tabulated in Table 4.4 below, results revealed that respondents agreed with mean score of 3.08 and standard deviation of 1.124 that the Simba System has reduced clearance time for transit goods. The study results revealed that respondents agreed with mean score of 4.07 and standard deviation of .516 that with the application of Simba System there is increased efficiency in cargo clearance for transit goods. Also the study results revealed that respondents agreed with mean score of 3.08 and standard deviation of 1.413 that with the application of Simba System there

is a reduction of the clearance cost incurred while respondents agreed with mean score of 3.05 and standard deviation of 1.207 that with the application of Simba System there is constituency and accuracy of declarations submitted.

Table 4.3: Simba System

Question	N	Mean	Std. Deviation
Transit goods clearance time has reduced	60	3.80	1.124
There is increased efficiency in transit cargo clearance	60	4.07	.516
Clearance cost for transit goods has reduced	60	3.08	1.413
There is constituency and accuracy of declarations	60	3.05	1.207

4.4.3 Data on Electronic Cargo Tracking System

From analysis as tabulated in Table 4.5 below, results revealed that respondents agreed with mean score of 3.35 and standard deviation of 1.005 that ECTS roll out has reduced transit cargo diversion along the Northern Corridor in Kenya. Also the study results revealed that respondents agreed with mean score of 3.75 and standard deviation of .728 that with ECTS cargo tracking cost has reduced. The study results revealed that respondents agreed with mean score of 2.78 and standard deviation of 1.779 that ECTS has enhanced cargo tracking on a real-time basis through monitoring while the study results revealed that respondents agreed with mean score of 2.49 and standard deviation of 1.456 that ECTS has increased the transit trucks turn-around time.

Table 4.3: Electronic Cargo Tracking System

Statement	N	Mean	Std. Deviation
Transit cargo diversion has reduced	60	3.351	.005
Transit cargo tracking cost has reduced	60	3.75	.728
Real-time monitoring has enhanced transit cargo tracking	60	2.78	1.779
Transit trucks turnaround time has increased	60	2.491	.456

4.4.4 Transit trade

From analysis as tabulated in Table 4.6 below, results revealed that respondents were in concurrence with a mean score of 3.99 and standard deviation of .704 that reduced cargo clearance time increases the volume of transit trade along the Northern corridor in Kenya. The study results revealed that respondents were in concurrence with a mean score of 4.27 and standard deviation of .662 that reduced cargo diversion increases the volume of transit trade along the Northern corridor in Kenya. Many of the respondents firmly concurred with a mean score of 4.16 and standard deviation of .647 that reduced transport cost increases the volume of transit trade along the Northern corridor in Kenya.

Table 4.6 Transit trade

Statement	N	Mean	Std. Deviation
Reduced cargo clearance time increases the volume Of transit trade	60	3.99	.704
Reduced cargo diversion increases the volume of Transit trade	60	4.27	.662
Reduced transport cost increases the volume of transit Trade	60	4.16	.647

4.5 Correlation Analysis

The researcher carried out correlation analysis, so as to set up the relationship between independent variables and dependent variables in the study.

4.5.1 Coefficient of Correlation

The study measured the correlation between the independent (automated customs systems) and dependent (transit trade) variables in order to establish the strength of linear association between the variables in question. Campbell & Swinscow (2011) considers correlation analysis as a dimensionless quantity measurement that explains variables in the range -0.05 to $+0.05$. While interpreting the correlation coefficients, if a coefficient is zero, that indicates that there is no linear relationship between the two continuous variables and when the correlation coefficient is -0.05 or $+0.05$, it means that there is a perfect linear relationship (Kornbrot, 2005).

Table 4.7 Coefficient Determination

		Transit trade	Single window system	Simba system	ECTS
Transit trade	P. Correlation	1			
	Sig. (2-tailed)				
	N	60			
Single window	P. Correlation	.822**	1		
	Sig. (2-tailed)	.000	.000		
	N	60	60		
Simba System	P. Correlation	.584**	.542**	1	
	Sig. (2-tailed)	.000	.000	.000	
	N	60	60	60	
ECTS	P. Correlation	.828**	.687**	.419**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	60	60	60	60

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

The research indicates that, all independent variables have a positive effect on volume of transit trade. The correlation between Single Window System and transit trade was 0.822 at significant

level of 0.00. The p-value obtained is 0.000, which is less than 0.05. This implies that at 95% confidence level, the positive relationship is statistically significant.

The correlation between Simba System and transit trade was 0.584 indicating a positive linear relationship with a p-value of 0.000 that is < 0.05 . This implies that at 95% confidence level, the positive relationship is statistically significant

The correlation between Electronic Cargo Tracking System and transit trade indicated a coefficient correlation of 0.828 with a P-value of 0.000, which is less than 0.05 and giving a positive relationship between ECTS and transit trade along the Northern corridor in Kenya. This implies that at 95% confidence level, the positive relationship is statistically significant.

4.6 Regression Analysis

In trying to estimate and establish the relationship between the variable, the study used regression statistical analysis to establish relationship between independent variable and dependent variable.

4.6.1 Coefficient of Determination

In Table 4.8 below shows regression model calculated at 95% level of significance. Coefficient of determination explains the extent to which changes in the dependent variable (transit trade) can be explained by the change in the independent variables. From the findings, the model has explained 82.9% of the variance as being attributed to a combination of the three independent systems investigated in this study that is, Single Window System, Simba System and ECTS, while the 17.1% is explained by other systems on transit trade not studied in this research.

Table 4.8 Model Summary

Model	R	R Square	Adjusted R	Std. Error of the				
		Square	Estimate	F Change	df1	df2	Sig.	
1	.884a	.829	.791	1.601	113.289	3	47	.000

a Predictors: (Constant), Single Window System, Simba System, ECTS

4.6.2. Multiple Regression Analysis

Multiple regression analysis was used to check the main effects that automated customs systems has on the volume of transit trade along the Northern corridor in Kenya. This section presents a summary of regression analysis between the independent variables including; Single Window System, Simba System and ECTS.

Table 4.9 Regression coefficient

Model	Unstandardized Coefficients			Standardized Coefficients	
	B	Std. Error	Beta	t	Sig.
1(Constant)	3.830	2.010		4.934	.000
Single Window System	.542	.079	.567	3.211	.002
Simba System	.348	.117	.241	6.897	.000
ECTS	.204	.065	.189	3.112	.002

Sig: 0.05 2(tailed)

From the table 4.9 above, the general regression Model equation can be derived as follows;

$$Y = 3.830 + .542X_1 + .348X_2 + .204X_3 + \varepsilon$$

Where,

Y= transit trade volume

X₁= Single Window System

X_2 = Simba System

X_3 = ECTS

ε = Error term of the regression

Therefore;

Transit trade volume (Y) = 3.830 + 0.542 Single Window System + 0.348 Simba System + 0.204 ECTS.

According to the regression equation established, taking all elements into account (Single Window System) the effect will be at 3.830. The standardized Beta coefficients give a measure of the contribution of each variable to the model. A large value indicates that a unit change in this independent variable has a large effect on the dependent variable. The t-test and sig (p) values gives a rough indication of the impact of each independent variable. A t-value of 2.0 and above is considered significant and a p-value of 0.05. A big absolute t-value and a small p-value suggests that an independent variable is having a larger impact on the dependent variable.

The study established a Beta of .567 for the Single Window System with a paired t-value of 3.211 and p-value of .000, Beta of .241 for the Simba System with a t value of 6.897 and p-value of .002, and the ECTS establishing a Beta of .189 with a t-value of 3.112 and p value of .002. This implies that all the tested variable had positive relationship with their effects being statistically significance with a t-value of above 2.0 and p value of less than 0.05.

4.6.3. Analysis of Variance (ANOVA)

It is a statistical method used to establish the significance of the regression model and to test differences between two or more means. The model is considered significant if its p-value is less or equal to 0.05. In the study, the significance of the regression model has a p-value of 0.00, as indicated in Table 4.9 below, which is less than 0.05. This indicates that the regression model was statistically significant in predicting the effects of automated customs system on the volume of

transit trade along the Northern corridor in Kenya. As indicated in the table below, ANOVA results showed that the model was significant at $F = 4.479$, with $p < .05$. At 95%, confidence level the analysis indicates high reliability of the results obtained thus indicating that the study was statistically determined.

Table 4.10 ANOVA^a

Model		Sum of Squares		df	Mean Square	F	Sig.
1	Regression	82.652		3	20.884	4.479	.000b
	Residual	291.974	60	4.226			
	Total	374.626	53				

a Dependent Variable: volume of transit trade

b Predictors: (Constant), Single Window System, Simba System, ECTS

4.7 Discussions of Research Findings

The Coefficients in the regression model shows that all of the tested variables had positive relationship, with all the variables tested being statistically significant with p-values less than 0.05. The findings imply that a unit change of X1(Single Window System), will result to 0.542 changes in the effects of automated customs system on volume of transit trade. A unit change of X2 (Simba System), will result in 0.348 change in the effects of automated customs systems on volume of transit trade and unit change of X3 (ECTS), will result in 0.204 change in the effects of automated customs system on volume of transit trade. Holding other effects constant on each effect change Y- Intercept ($\beta_0 = 3.830$), as indicated in Table 4.9, predicts the effects of automated customs system on volume of transit trade will be 3.830 when all other independent variables are zero. From the analysis in table 4.9, Single Window System X₁ ($\beta = 0.542$, $p < 0.05$) has the strongest

relationship followed by Simba System $X_2(\beta = 0.348, p < 0.05)$ and ECTS $X_3(\beta = 0.204, p < 0.05)$. All the three variables significantly predicted the effects of automated customs system on volume of transit trade along the Northern corridor in Kenya.

From the analysis, the findings showed a linear positive relationship. This implies that a unit increase in X_1 (Single Window System), will result to 0.542 increase in volume of transit trade, unit increase in X_2 (Simba System), will result to 0.348 increase in volume of transit trade and a unit increase in X_3 (ECTS), will result to 0.204 increase in volume of transit trade along the Northern corridor in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The study evaluated the extent of the effects of automated customs systems on volume of transit trade along the Northern corridor in Kenya. This chapter discusses the summary of findings, conclusions, recommendations and areas for further research.

5.1 Summary of findings

The objective of this study was to establish the effects of automated customs systems on volume of transit trade along the Northern Corridor in Kenya. The findings showed that, the educational background attained by the respondents established that most of the respondents had a sound educational background thus making the study reliable and valid on the basis of educational level. It was also established that most respondents had sufficient experience and knowledge in regard to automated customs systems and transit trade.

5.1.1 Effects of Single Window System on volume of transit trade

From the study carried out, the findings established that the application of the Single Window System has positive effects on volume of transit trade with the system ensuring effective monitoring and accounting for cargo, faster submission and approval of cargo clearance documents, eliminating data duplication as well as seamless flow of data among the stakeholders. Regression analysis established a positive relationship between the Single Window System and the volume of transit trade (t-value, 4.934 and p –value, .000). The findings are consistent with a survey done by the WCO (2012), that established that the Single Window System speeded up the processing of data information hence enhancing effective monitoring and accounting thus providing better services due to the seamless flow of information among the participants.

5.1.2 Effects of Simba System

From the analysis, results revealed that the application of the Simba System has positive effects on the volume of transit trade along the Northern Corridor in Kenya with the system helping in the reduction of the clearances time for transit goods, increased efficiency in the cargo clearance

process, reduction in the cargo clearance cost as well as increased consistency and accuracy of declaration made by the clearing agents.

Regression analysis established a positive relationship between the Simba System and the volume of transit trade (t-value, 6.897 and p-value, .000). The findings are consistent with a report released by USAID (2007) that enumerated on the benefits derived through the application of the Simba System which included the reduction of clearance time as well as cost. The study concurs with Kaibe (2012) that the application of the Simba System has enhanced the facilitation of international trade which includes transit trade due to the faster processing of clearance documents thus an evidence in the reduction of the time taken to clear goods.

5.1.3 Effects of ECTS

From the analysis, the results established that the application of ECTS has positive effects on the volume of transit trade along the Northern Corridor in Kenya with the system helping in the reduction of cargo diversion cases, reducing the cargo tracking cost, enhancing real-time cargo monitoring as well as helping increase the cargo trucks turn-around time.

Regression analysis established that there was a positive relationship between ECTS and the volume of transit trade (t-value, 3.112 and p-value, .002). The findings are consistent with a research done by Bhero et al. (2015) that established that the average transit time across all cargo types is significantly reduced when they are installations of these measures, also Chung (2004) found out that real-time monitoring and reporting of incidents and on any other issue affecting transporters helps reduce cargo diversion cases.

5.2 Conclusions

The purpose of the study was to establish the effects of automated customs system that are implemented by the customs administration on the volume of transit trade. The analysis of the correlations results supports the hypothesis that each independent variable (Single Window System, Simba System, and ECTS) has positive effects on the dependent variable (transit trade). Therefore, the study concludes in order to enhance volumes of transit trade along the corridor, automated customs systems should be effectively addressed. This calls for the relevant stakeholders to pull forces towards developing long lasting solution in regard to time, cost and cargo diversions in the transit trade business.

5.3 Recommendation

The Government should enhance capacity building clearing agents and customs officials to embrace the use of Single Window System, Simba System and electronic cargo tracking system. This will go a long way in improving efficiency and effectiveness and the cargo chain. The customs officials should ensure that all the players embrace the technology without any favourism, thus all the players in the cargo clearing and distribution should strictly use the technology. It has been established that the single system, Simba System and electronic cargo tracking system all have aided in efficiency in the clearing and transportation chain, the government should ensure that they keep on upgrading the system and maintaining them to the required standards to reduce the downtime and being overtaken by new technology.

5.4 Suggestion for further studies`

A study should be carried out increasing the sample size from the current 85 to probably a census and establish the effect automated customs systems on transit trade along the Northern corridor in Kenya. A similar study should be undertaken targeting the East Africa countries and establish whether there is any difference with the Kenyan context.

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APPENDIX I

INTRODUCTORY LETTER TO RESPONDENTS

Re: Data collection.

Dear Respondent.

I am a student at **KENYA SCHOOL OF REVENUE ADMINISTRATION** pursuing a **Post Graduate Diploma in Customs Administration**. Currently, am undertaking a research study on **“EFFECT OF AUTOMATED CUSTOMS SYSTEMS ON VOLUME OF TRANSIT TRADE ALONG THE NORTHERN CORRIDOR IN KENYA”**. Kindly, assist me collect necessary information in regard to the above mentioned topic by completing the attached questionnaire. Please answer all the questions correctly and honestly. Your responses will be highly appreciated and it is solely for academic purposes; therefore your opinion will be completely confidential.

Thank you for your participation.

Sincerely,

Millymercy Wanjau,

Researcher

APPENDIX II

RESEARCH QUESTIONNAIRE

AUTOMATED CUSTOMS SYSTEMS DATA COLLECTION FORM

The questionnaire is designed to collect data on the effect of automated customs systems on transit trade along the Northern Corridor in Kenya. Your responses shall be accorded total confidentiality and will only be used for academic purposes.

SECTION A: General information

1. Gender

Male [] female []

2. Name of the organization

.....

3. Designation of the respondent

.....

4. What is your level of education

Secondary ☐ Diploma ☐ Degree ☐

5. How long have you worked in the organization

Below 6 months ☐ 3 years – 5 years ☐

6 months - 2 years ☐ above 5 years ☐

6. Which category does your organization fall in

Government ☐ clearing agent ☐

Import/export ☐ transport and logistics ☐

SECTION B: SINGLE WINDOW SYSTEM

In your own opinion, to what extent do you agree or disagree with the following statements in regard to the Single Window System. Please indicate by ticking in the appropriate box where 1= strongly agree, 2= agree, 3= uncertain, 4= disagree, 5= strongly disagree

Statement	1	2	3	4	5
There is effective monitoring and accounting for transit cargo					
There is faster submission and approval of transit cargo clearance documents					
Data duplication has been eliminated					

There is seamless flow of data among stakeholders In the transit business					
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SECTION C: SIMBA SYSTEM

In your own opinion, to what extent do you agree or disagree with the following statements in regard to the Simba Window System. Please indicate by ticking in the appropriate box where 1= strongly agree, 2= agree, 3= uncertain, 4= disagree, 5= strongly disagree

Statement	1	2	3	4	5
Transit goods clearance time has reduced					
There is increased efficiency in transit cargo clearance					
Clearance cost for transit goods has reduced					
There is consistency and accuracy of declarations					

SECTION D: ELECTRONIC CARGO TRACKING SYSTEM

In your own opinion, to what extent do you agree or disagree with the following statements in regard to the Electronic Cargo Tracking System. Please indicate by ticking in the appropriate box where 1= strongly agree, 2= agree, 3= uncertain, 4= disagree, 5= strongly disagree

Statement	1	2	3	4	5
Transit cargo diversion has reduced					
Transit cargo tracking cost has reduced					

Real-time monitoring has enhanced transit cargo tracking					
Transit trucks turnaround time has increased					

SECTION D: TRANSIT TRADE

To what extent do you agree with the following statements in regard to transit trade?

Please tick appropriately where 1= not at all, 2= slightly, 3= moderately, 4= totally

Question	1	2	3	4
Reduced cargo clearance time increases the volume of transit trade				
Reduced cargo diversion increases the volume of transit trade				
Reduced transport cost increases the volume of transit trade				

End of questionnaire.

Thank you for your time