MOSHI CO-OPERATIVE UNIVERSITY

EFFECT OF CUSTOMS SYSTEM AUTOMATION ON REVENUE COLLECTION PERFORMANCE: A CASE OF CUSTOMS DEPARTMENT IN KILIMANJARO, TANZANIA

MOSHI CO-OPERATIVE UNIVERSITY

EFFECT OF CUSTOMS SYSTEM AUTOMATION ON REVENUE COLLECTION PERFORMANCE: A CASE OF CUSTOMS DEPARTMENT IN KILIMANJARO, TANZANIA

BY

PAULINA ROMANUS KYENCHE

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER OF BUSINESS MANAGEMENT OF MOSHI CO-OPERATIVE UNIVERSITY, MOSHI TANZANIA

DECEMBER, 2023

DECLARATION AND COPYRIGHT

I**, PAULINA ROMANUS KYENCHE,** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other higher learning Institution for a similar or any other academic award.

Signature_____ **Date** 14/10/2023

CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by the Moshi Co-operative University a Dissertation titled "**Effect of Customs System Automation on Revenue Collection Performance: A Case of Customs Department in Kilimanjaro, Tanzania"** in partial fulfillment of the requirements for the award of a degree of Master of Business Management of Moshi Co-operative University.

DR MFDA MRIMI

(Supervisor's Name)

(Supervisor's Signature)

Date 15/12/2023

Dr. Mathias S. Nkuhi

(Supervisor's Name)

(Supervisor's Signature)

Date 15-12-2023

Signature _____ Date 14/12/2023

DEDICATION

I would like to express my dedication to my son Kingsley, my dearest husband Mr. Gilbert Mchase, my parents Mr. and Mrs. Romanus Kyenche and my siblings for their generous support and unwavering patience during my academic pursuit.

ACKNOWLEDGEMENT

Praise be to the most compassionate and benevolent Lord God of the Earth and Heaven, whom I deeply revere. I express my gratitude to all individuals who contributed to the completion of this dissertation, without them it would not have been possible. Their moral and material support deserves my heartfelt appreciation. I extend special thanks to my supervisors, Dr. Meda T. Mrimi and Dr. Mathias Nkuhi, for their professional guidance and encouragement throughout the entire process dissertation writing.

I would also like to acknowledge the Tanzania Revenue Authority (TRA) in Kilimanjaro Region and their team for graciously hosting the researcher and providing support during data collection phase. Furthermore, I am sincerely grateful to the staff at Tarakea, Holili one-stop border post, and Kilimanjaro airport, particularly the customs employees at Tarakea and Holili, for their cooperation and assistance.

Additionally, I cannot overlook the valuable contributions and encouragement received from Dr. Damian Sambuo and my friend Maryness Honoratus. Their ideas, suggestions, and constructive criticisms greatly aided me in the successful pursuit of my study. They consistently provided moral support and material assistance that propelled my research forward. Lastly, I would like to express my appreciation to all those who supported me in various ways, even though their names are not mentioned in this document. I am sincerely grateful for your moral and material support, and I pray that our Almighty God blesses every one of you abundantly.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURE

LIST OF ABBREVIATIONS

ASYCUDA	:	Automated System of Customs Data
CA	:	Content Analysis
CO	:	Customs Officer
COVID-19	:	Corona Virus Disease 2019
CVI	:	Content Validity Index
ECTS	:	Electronic Cargo Tracking System
ETS	:	Exemption tracking system
GDP	:	Gross Domestic Product
ICT	:	Information Communication Technology
KIA	:	Kilimanjaro International Airport
KII	:	Key Informant Interview
KPMG	:	Klynveld Peat Marwick Goerdeler
KRA	:	Kenya Revenue Authority
MoCU	:	Moshi Cooperative University
OECD		Organisation for Economic Co-operation and Development
OSBP	:	One Stop Border Post
SPSS	:	Statistical Package for the Social Sciences
TANCIS	:	Tanzania Customs Integrated System
TISS	:	Tanzania Inter Bank System Scheme
TRA	:	Tanzania Revenue Authority
TZS	:	Tanzanian Shillings
UNCTAD	:	United Nations Conference on Trade and Development
URT	:	United Republic of Tanzania
WCO	:	World Customs Organisation
WTO	:	World Trade Organisation

ABSTRACT

The study assessed the effect of customs system automation on revenue collection performance in Kilimanjaro, Tanzania. Specifically, it examined the impact of integrated cargo management technologies on customs revenue performance, the influence of capacity building on customs revenue collection performance, the moderating effect of capacity building on the relationship between integrated cargo management technologies and customs revenue collection performance, and the challenges faced during the transition from traditional to automated customs systems in Tanzania. A cross sectional research design was used to collect data from 141 sampled customs officials and clearing agents who were selected using random sampling and cluster- sampling technique from customs stations in Kilimanjaro. Self-administered survey questionnaire and interviews were used as methods for data collection. Descriptive statistics, content analysis and multiple linear regression model were used to analyse data. Findings indicated that customs system automation, particularly through electronic cargo tracking systems, positively affects compliance rates by improving transparency, accountability, and traceability, while cargo scanner technology and cargo valuation systems have limited influence. Compliance is influenced by various factors, including training, enforcement, regulations and monitoring. The extensive use of electronic tracking systems may negatively impact transparency, necessitating additional measures such as effective governance, monitoring, and controls. Capacity building efforts, including collaboration, risk management, and staff training, significantly contribute to compliance rates and revenue collection performance, although the impact on transparency may vary depending on the context. Challenges during the transition from traditional to automated systems, such as system breakdowns, political will, and staff shortages. Thus concluded the influence of electronic cargo tracking systems on customs compliance. However, challenges persist, necessitating complementary measures for effective governance and capacity building. Therefore, the study recommends that the Tanzania Revenue Authority (TRA), the Customs Department, industry associations, and relevant stakeholders prioritize the implementation and utilization of electronic cargo tracking systems, along with investing in cargo scanner technology, the cargo valuation system, comprehensive controls, governance mechanisms, training programs, collaboration, information sharing, risk management practices, transparency measures.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

With increasing globalization and regional integration, customs and excise duty have become a major source of revenue which governments rely on to facilitate their operations. The World Bank Group (2022) emphasize that collection of taxes is a primary development agenda needed to facilitate the provision of basic citizen's needs, investment in development projects for a nation's future prosperity. Considering this key role of taxes, the World Bank Group (2022) advises that country's need to collect at least 15% of gross domestic product (GDP) to be able to meet basic citizen's needs. This calls for efficiency and effectiveness of tax collection system to ensure that tax revenue collection targets are achieved, since Smith (2010) noted that convenience, and efficiency are some of the key attributes of a functional taxation system.

With this realization, many developed countries have automated their customs systems to maximize revenue collections. For instance, in countries such as Denmark, France, Italy and Sweden tax revenue is more than 40% of their GDP (OECD, 2021). A recent report by OECD (2021) showed that tax-to-GDP in 2020 was 46.5%, 45.4%, 43.1% and 42.9% in Denmark, France, Belgium, Italy and Sweden, respectively. Sweden has a single window system also called virtual customs office that permits submission of customs declarations and applications of import and export licenses electronically. The single window system integrates all relevant departments hence submission of documents is only done once, and it can be inspected by all the involved department such as police and customs (Synder, 2017). This efficiency in cargo clearance enables the Swedish government meet its revenue collection targets. In Middle East, Afghanistan adopted Automated System for Customs Data (ASYCUDA) for its customs clearance in 2016 (UNCTAD, 2019). ASYCUDA enabled the Afghanistan government to collect an additional revenue of US $116 million in 2016 and $ 1 billion in 2018 in customs and excise duties.

Moreover, automation of customs systems has had significant impact in Africa, many countries in Africa still fall short of their planned revenue collection targets. According to UNCTAD (2022), although forty-one (41) African countries have automated their customs system, a majority of them collect approximately 16% of their GDP in taxes, performing dismally relative to emerging economies 18% and 26% in developed

economies (Akitoby *et al,* 2019). Mauritania was the first country to automate its customs revenue collection system by adopting ASYCUDA (UNCTAD, 2019). The country has been reporting an increase in revenue collection with 15% increase in 2016. However, despite the increase, the country has not been able to achieve to its revenue collection targets. Similarly, Angola reported increase of 43% in revenue collection in 2018 after implementing ASYCUDA system (UNCTAD, 2019).

Within the East African region, countries such as Kenya and Uganda have automated their customs systems, fully functional on ASYCUDA, and regional electronic cargo tracking system. The automation is part of the East African Community initiative to achieve single customs territory. Uganda reported a 48% increase in customs revenue in 2015, after automating its customs systems in 2014 (The East African, 2015). Kenya has an integrated customs management system that links Kenya Revenue Authority (KRA) internal system with external stakeholders (KRA, 2018). Despite of automation of customs system, Uganda has not been able to achieve their revenue collection target. For instance, Uganda has not achieved its collection target for the last five consecutive years, managing to collect UGX 19.2 trillion out of targeted UGX 21.6 trillion (The Independent, 2021). Kenya met its tax revenue collection target in 2020/2021 despite of economic downturn occasioned by COVID-19. The country collected Kshs.1.669 trillion, against a set target of Kshs.1.652. Much of this success was attributed to customs revenue, which exceeded the set target, by Kshs.18 billion (Otieno, 2021). As such, the effect of automating customs system on revenue collection performance is still in question.

Tanzania's journey to automation of revenue collection can be traced back to 2005 when it adopted Automated System for Customs Data (ASYCUDA) pioneered by United Nations Conference on Trade and Development (UNCTAD). The ASYCUDA had immediate impact, reducing the average time of clearing goods at airports from 4 days to 9 hours and 7 days to 2 days at sea ports, improving transparency of customs clearance procedure, and facilitating trade between Tanzania and its trade partners (UNCTAD, 2022). With ASYCUDA, the government introduced Tanzania-Inter Bank System Scheme (TISS) to support electronic payment of customs duties by allowing importers to pay directly from their bank accounts to the TRA's account. The introduction of TISS was hailed as a major step towards reducing corruption at the border. Thus in 2010 ASY-SCAN system was adopted to enable electronic submission of customs documents

reducing paperwork in customs clearance. In 2014, the government shifted from ASYCUDA to Tanzania customs integrated system (TANCIS). The TANCIS has integrated various customs functional systems including ASY-Bank, pre-arrival declaration, customs licensing application management, oil monitoring system and exemption tracking system (ETS) (TRA, 2022).

However, despite this system being in place, TRA has been failing to meet its revenue collection targets year-on-year, which are set below 15% of the country's gross domestic product (GDP). For instance, in 2016/2017, TRA had customs revenue collection target of Tshs. 15,872 billions, but only Tshs. 14,222 was realized (The Citizen, 2018). In 2017/2018, TRA collected Tshs15.5trilion against the set target of Tshs. 17.1trillion (The Citizen, 2018). In 2019/2020, customs revenue collected was Tshs. 17,869 billion falling short of the set target of Tshs. 19,245 billion (Deloitte, 2020). Same trend continued in 2020/2021 where only Tshs. 17,847 billion in customs revenue was collected out of Tshs. 20,734 billion (KPMG, 2021). The failure to meet revenue collection targets has directly contributed to rising public debt standing at 39.2% of the country's GDP as at October 2020 according to African Development Bank (2021), as the government borrows to finance its deficit budget. Based on this background, this study intended to assess the effect of automating customs systems on customs revenue collection in Kilimanjaro region, Tanzania.

1.2 Statement of the Problem

The role of tax revenue in a country's ability to achieve its social, economic and political goals cannot be underestimated. An efficient tax revenue collection system is associated with reliable public services and manageable public debt (World Bank Group, 2022). Over the years, Tanzania Revenue Authority has not been able to achieve its country's tax revenue collection targets, hence being forced to borrow to finance budgetary deficit (African Development Bank, 2021). Tanzania whose tax-to-GDP ratio is 11.7%, falls way below the World Bank Group (2022) recommendation, that low-income countries ought to collect 15% of GDP in taxes to provide essential citizen needs. The trend has continued despite the automation of the country customs revenue collection system.

Failure to achieve its revenue collection targets has affected the country's ability to effectively provide essential public services including healthcare and electricity. While 95% of Tanzanians rely on public health facilities for primary healthcare service

(Kapologwe *et al.* 2020), 94% of public hospitals experience essential medicine shortage (Twaweza, 2017). This has increased mortality rate from easily preventable diseases such as Malaria. Lack of enough revenue has affected the government ability to provide reliable electricity with most businesses losing 15% of sales annually due to power shortages (Garside and Wood, 2018). Similarly, due to low tax revenue collection, the government has been forced to accrue both domestic and external debts which has risen to 39.2% of its GDP (African Development Bank, 2021). The ballooning public debt is directly contributing to increased cost of living in Tanzania (Anyanzwa, 2021), as the government imposes higher and more taxes to service them.

Studies (Kilonzi and Kanai, 2020; Omosa, 2020; Gitaru, 2017) have been conducted, examining the effect of automation on tax revenue collection. For instance, a study by Omosa (2020) and Gitaru (2017) in Kenya, reported that there was a significant relationship between automation of revenue collection system and amount of revenue collected. Kilonzi and Kanai (2020) study at the border posts of East African countries found a relationship between ECTS and revenue performance. What is not known, however, is the effect of customs system automation on revenue collection performance in Tanzania, since most of the studies conducted were carried out in Kenya. The studies in Kenya cannot be extrapolated to Tanzania given that they focused on entire tax revenue rather than customs revenue (Nthenge, 2020; Omosa, 2020; Gitaru, 2017).

In addition, the methodology applied the studies in Kenya measured perception on performance rather than compare secondary data on revenue collection over time before and after automation of customs system (Nthenge,2020). Lastly, Kenya imports more than it exports compared to Tanzania, scores poorly on government corruption index, and it has achieved its customs revenue collection target for three consecutive years, 2019/20, 2020/21 and 2021/22 (Georank, 2022; KRA, 2022). This study, therefore, intended to fill the contextual research gap by assessing the effect of automating customs system on customs revenue collection performance in Kilimanjaro region, Tanzania.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study was to assess the effect of customs system automation on customs revenue collection performance in Kilimanjaro, Tanzania.

1.3.2 Specific Objectives

The study aimed to;

i. Determine the effect of integrated cargo management technologies on customs revenue collection performance.
ii. Examine the effect of capacity building on customs revenue collection performance.
iii. Determine the moderating effect of capacity building on the relationship between integrated cargo management technologies and customs revenue performance.
iv. Explore the challenges facing transition from the traditional to automated customs system in Tanzania.

1.4 Research Questions

i) What is the effect of integrated cargo management technologies on customs revenue collection performance?
ii) What is the effect of capacity building on customs revenue collection performance?
iii) What is the moderating effect of capacity building on the relationship between integrated cargo management technologies and customs revenue collection performance?
iv) What are the challenges facing transition from traditional to automated customs systems in Tanzania?

1.5 Justification of the Study

The study contributes towards comprehensive understanding of Tanzania's customs system. The government of URT is increasingly finding it necessary to borrow externally to fund its developmental projects and essential service sector such as education and healthcare. Whereas external borrowing may not be eliminated, deficit in budget is usually caused by deficit in revenue collection. By examining the effect of automation of customs system on customs revenue collection, this study provides fundamental management information that can lead to improving the entire Tanzania revenue collection system.

In high quality livelihood goal of Tanzania Development vision 2025, it is envisioned that Tanzania will have food security, universal primary education, gender equality, and reduced infant mortality rate (URT, 2022). The third goal is to build a strong and

diversified semi-industrialized economy with adequate physical infrastructure (URT, 2022). The realization of these goals will depend on the effectiveness and efficiency of the governments towards collecting and utilizing tax revenue. With growing regional trade, this study provides the insights for informing policy changes in customs and excise duty as a source of revenue to fund Tanzania Development vision 2025.In particular, TRA and Ministry of Trade may use these findings to increase efficiency in customs revenue collection and promote regional trade to increase customs and excise duty collected.

There is very scarce literature on customs revenue performance in Tanzania. A quick search on the internet for studies on customs revenue performance yield only two studies showing scarcity of research in this topic. The findings of this study will provide the relevant literature that will act as catalyst for further studies in this area especially in other regions of the country.

1.6 Limitation of the Study

The study did not consider the customs revenue collection data specifically from each station from tradition to automated system as it was hard to find the customs revenue collection data from each station before automation. However, regional wise data from customs and excise department were used to compare the customs revenue collection before and after automation. Another limitation of the study was time constrain such that the time taken to return the questionnaire from the respondents exceeded the set timeframe for data collection. To overcome the limitation, respondents were urged to return the questionnaire on time through follow-ups.

1.7 Organisation of the Study

This study was organised into five chapters. The first chapter consisted of the introduction with the background information, statement of the problem, research objectives, research questions and justification and limitations of the study. The second chapter presented the literature review, consisting of the definition of key terms, theoretical review, empirical literature review, research gap and the conceptual framework. The third chapter is the research methodology which presented the research design, study area, target population, sample and sampling technique, types and sources of data, data collection method, reliability and validity of data and data analysis. Then

chapter four presented the findings and discussion of the results. Lastly, chapter five presented a summary of the findings, conclusion and recommendation.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definition of Key Terms

2.1.1 Customs System

Customs system refers to the government function responsible for determining and collecting the customs duties and taxes on goods entering the country to facilitate international trade (WTO, 2022). On another hand, Dossymbekova *et al.* (2016) defines customs system as the function in charge of enforcing prohibitions and restrictions on imports and exports based on legal requirements of a country, hence showing that customs system is concerned with restricting cross-border trade. Kinyua (2019) also states that customs system also involves the clearance of international passengers and cross-border transport vessels. This study adopts the definition by WTO (2022) since the role of customs system is to facilitate international trade, hence creating opportunities for collecting more tax revenues.

2.1.2 Customs Valuation System

According to WTO (2022), customs valuation system refers to the process of establishing the value of imported goods for purposes of determining the customs duties. On another hand, the World Customs Organization (2022) defines customs valuation as the process of determining the transactional value of the imported goods for marching required import duties. As such, this study adopts the definition of WCO since it defines and identifies the basis for determining customs duties.

2.1.3 Customs System Automation

According to United Nations (2012) customs automation refers to the use of information and communication technologies in the entire customs function. Gidisu (2012) offers a more general definition of customs automation as the process of moving from manual execution of customs functions to digitalized system that requires less human intervention. Both United Nation's (2012) and Gidisu's (2012) definitions point to the use of ICT system. This study adopts the definition by United Nations (2012) since customs automation is not simply moving from manual to digitalized system but doing so in manner that improves the functionality of the entire system.

2.1.4 Cargo Scanner Technology

Peterson (2017) defines scanner technology as the non-intrusive cargo inspection

technology that is used at the ports to determine the type of goods on transit. As such, unlike manual inspection where the shipment has to be opened, scanner technology uses special rays to establish the types of goods being transported. The system is efficient, and accurate compared to manual inspection. This study will use Peterson's (2017) definition.

2.1.5 Electronic Cargo Tracking System

Cargo tracking system is a real-time cargo tracking technology fitted on the goods being transported to ensure that goods reached the declared destination (Amosa, 2020). Cargo tracking system is used to ensure that there is no dumping of goods in the country, and rightful amount of tax and excise duties is paid on imported goods (Ha *et al.*, 2022).

2.1.6 Revenue Collection Performance

Customs revenue performance is defined by Kunaka and Carruthers (2014) as the amount of customs and excise duty revenue collected against the set collection target. In this study, customs revenue collection performance is defined as performance indicator of customs department efficiency and effectiveness in terms of preventing tax evasion, tax leakage, hence improving collection of customs duty revenue.

2.2 Theoretical Review

2.2.1 Technological Determinism Theory

Technological determinism theory is the guiding theory for this study, and it is complemented by systems theory. The later was developed by Thorstein Veblen (1857-1927) who was both an economist and sociologist (Marx and Smith, 1994). The main argument of technological determinism theory is that advancement in technology can be used to solve all societal problems. Marx and Smith (1994) expound on this doctrine by stating that technological determinism theory holds that technological innovations are the primary causes of social progress. In other words, technology determines changes in the society. Taken in the context of this study, development in technology for instance, adoption of cargo scanner technology, electronic cargo tracking system and valuation system should enable the government to meet its tax collection revenue targets. That electronic cargo tracking system should eliminate dumping of goods in the local market. This view is based on the argument that technological inventions such as steam engine had immediate effect on transport system.

While proponents of technological determinism theory have argued that technology alone should be considered as the only driver of societal change, this stance has been widely criticized (Dafoe, 2015). One of the critiques levelled against the theory is that one factor cannot account for entire societal change. According to Dafoe (2015) understanding societal change requires examination of the entire system rather than a single part of the system. This implies that taking a holistic picture of customs systems, examining the systemic failures can help to understand excise revenue collection performance. For instance, even though technological advancement may have introduced electronic processing of customs documents, certain customs officials may still insist using paper documents due to lack of computer knowledge. Similarly, many developing countries are still not able to meet their tax collection targets even after automating their tax administration system. Consequently, system theory, which emphasizes on the whole, will be used in the study to complement technological determinism theory.

2.2.2 System Theory

The system theory was developed by Ludwig von Bertalanffy (1974), Boulding (1985), Rapoport (1986) and Skyttner (1996). Although the theory was not originally developed as business theory, its tenets have found major application in organizational management (McSherry and Warr, 2010). The system theory depicts an organisation as an entity made up of various sub-units which are interrelated and combine to make the whole (von Bertalanffy, 1974). Skyttner (1996) explains that system theory main purpose is explaining the whole system and not just part of the organization.

The systems theory underscores that, for organization to achieve its results, every unit has to play its role effectively. As such, it may not be possible to improve revenue collection by just automating customs system. Although the introduction of cargo tracking system, scanner technology and customs valuation system may have reduced clearance time, increased transparency in the system, they are just part of the system and not the whole system. This explains why even after automation; the customs department has not been able to achieve its revenue collection targets. Other factors that might be affecting customs revenue collection need to be examined and identified. In this study, system theory was used to help understand the effect of whole system; customs automation and other factors on customs department performance.

2.3 Empirical Literature Review

2.3.1 Integrated cargo management technologies

There is a growing interest from the scholarly community on the effect of automation on government revenue collection performance. One such a study was conducted by Kioko (2020) to determine the effect of technology acceptance on productivity of customs officers in Kenya. The study determined the extent of perceived ease of use of technology and facilitating conditions affected the performance of customs officials in Mombasa, under the lenses of technology acceptance theory, unified theory of acceptance and use of technology, and theory of planned behaviour. Explanatory survey design was adopted and data was collected through a census survey. Through multiple linear regression analysis, the study revealed that there was a significant relationship between ease of use of technology and the performance of customs officials. The study also found that facilitating conditions such as existence of technical infrastructure significantly affected the performance of customs officers. Although Kioko (2020) study provide a very insightful background for interpreting the findings of the current study, it might not be possible to conclude that improved employee performance as a result of technology acceptance affects customs revenue collection performance. Thus, examining the role of automation of customs system on customs revenue collection is still important to fill this gap.

Nthenge (2020) study sought to examine the relationship between process automation and KRA revenue collection performance, in Kenya. The study adopted explanatory research design and was guided by public expenditure theory, technology determinism theory and social determinism theory. The study revealed that there was a significant relationship between tax revenue collection system automation and revenue collection performance. However, what Nthenge (2020) study did not establish; acknowledging the scope limitations of the study; was whether similar positive effect can be reported across all divisions of tax revenue such as customs divisions. In this manner, the study did not identify which aspects of automation had an effect on revenue collection performance. The current study intends to fill this gap by focusing on customs system automation and revenue collection performance in Kilimanjaro region, Tanzania.

2.3.2 Electronic Cargo Tracking System and Revenue Collection Performance

Amosa (2020) conducted a study to establish the effect cargo tracking technology on customs revenue collection performance in Kenya. The study, which adopted explanatory research design revealed that cargo tracking system significantly and positively predicted customs revenue collection performance. Specifically, Amosa (2020) found that containerized cargo transit management and motor vehicle transit management helped to prevent dumping increasing revenue collected on imports. An earlier study by Mugambi (2017) had also reported similar findings. The study found that electronic cargo tracking between Kenya and Uganda borders had reduced cargo clearance time, dumping of goods in the local market and the cargo monitoring costs incurred by the customs department (Mugambi, 2017). Thus, the study found a positive relationship between cargo tracking and revenue collection performance at border points. The current study will depart from the existing studies by examining the effect of ECTS in Tanzania, a country with different contextual conditions from those covered in literature.

A very recent study by Odago (2021) supported the findings of Mugambi (2017) and Amosa (2020). Odago (2021) who carried out a study to determine the effect of electronic cargo tracking system on customs revenue collection at Jomo Kenyatta International Airport in Kenya revealed that there was a relationship between electronic cargo tracking system and customs revenue collection at the airport. The study pointed out that electronic cargo monitoring, cargo security and information sharing significantly and positively affect excise revenue collection. In conclusion, the existing literature proves that automating customs system by adopting electronic cargo monitoring system improves revenue collection. Nonetheless, given that these studies were done in Kenya, can the same results be found in Tanzania? The current study will seek to fill this contextual gap by conducting a similar study in Kilimanjaro, Tanzania.

2.3.3 Valuation System and Revenue Collection Performance

While Mumia (2021) did not examine valuation system, their study conducted in Mombasa, Kenya revealed that there was a positive relationship between automation of payment system and customs performance. Specifically, the study showed that automatic deduction of port charges and online system of payments at the port improved revenue collection.

Another study by Gitaru (2017) revealed that there was a positive relationship between an automated tax revenue collection system and revenue collection performance in Kenya. Like Nthenge (2020), Gitaru (2017) focused on the entire tax collection system. Although this approach is significant in generalizing, it is limited in singling out the area of tax collection that is affected by automation. Given the increasing trade between Tanzania and its regional partners both for East African Community and SADC, the current study will focus on examine customs system automation and revenue collection performance.

2.3.4 Cargo Scanner Technology and Revenue Collection Performance

Although Amosa (2020) reported a significant relationship between scanner technology and customs revenue collection performance, the study's main objective was to identify the effect of cargo scanner technology on port operations and processes. For instance, Amosa (2020) was concerned with the effect of scanner technology taking over human jobs, effect of electromagnetic x-rays on goods and the initial cost of investing in scanner technology. This study will examine the effect of cargo scanner on valuation of cargos, time of clearance, prevention of smuggling and colluding with port authorities to avoid paying the required customs duties. Similarly, another study by Min, Park, Lim and Cho (2016) done in South Korea reported that there was an increase in revenue income as a result of adoption of x-ray technology at the ports. Nonetheless, Min *et al.* (2016) study referred to sales revenues earned by various logistics service providers at the ports carefully demonstrating the x-ray scanner technology increased profits from unloading income, wharfage fees, and incidental income, departing from customs revenue. This study aims at finding the effect of cargo scanner technology on performance of customs and excise duties at the ports.

2.3.5 Capacity Building and Revenue Collection Performance

A study by Nthenge (2020) investigated the relationship between capacity building and revenue collection performance at KRA headquarters in Kenya. The study adopted explanatory research design to collect data 384 KRA employees working at Times Towers. The study reported that capacity building significantly affected revenue collection performance in Kenya. Nthenge (2020) also found that capacity building negatively but significantly moderates the relationship between automation and revenue collection performance. While Nthenge (2020) findings are very informative, their study relied on perception about performance rather than real revenue collection performance.

This current study will fill the gap by examining capacity building vis-à-vis customs revenue collection performance.

2.3.6 Challenges Facing Transition from Traditional to Automated System

There is very scarce empirical literature on challenges facing customs revenue collection, since many existing studies have focused on general tax revenue collection (Ha *et al.*, 2022; Ngotho, 2014). Nonetheless, a study by Ifere and Okoi (2018) showed that lack of internal political goodwill was a major challenge for transition from old to automate tax collection system in developing countries. The study reported that some governments in developing countries were reluctant to reform and implement reforms in the taxation system since the existing lope holes were benefiting their political insiders. Such findings were reported in Uganda by Kangave and colleagues (2016). Administrative constraints, particularly inadequate staffing of tax authorities, and lack of training and continuous capacity building among tax officials were reported as major barriers to increase revenue collected through taxes (Amin *et al.*, 2014).

Mandala *et al.* (2020) found that resistance of employees to change, poor ICT infrastructure were major challenges facing county governments in Kenya from fully automating their revenue collection system. Another study by Oduor *et al.* (2016) found that frequent breakdown in the system hence reverting to manual system is a major challenge. Oduor *et al.,* (2016) also reported lack of continuous improvement of the system, and poor management of change as key challenges faced when automating customs revenue system.

2.4 Research Gap

The existing literature has identified that automating customs system has positive and significant effect on customs revenue collection (Odago, 2021; Amosa, 2020; Mugambi, 2017; Min *et al.,* 2016). It has also identified that certain contextual conditions, such as corruption, internal political goodwill towards enforcing tax laws, bilateral trade agreements, staff competence and adequacy, among others similarly affect tax revenue collection performance (Ifere &Okoi, 2018; Epaphra & Massawe, 2017; Amin *et al.,* 2014). Therefore, as those studies were conducted in different countries with diverse contextual conditions, particularly regarding imports, the efficiency of the revenue collection system, and the level of corruption, it is unreliable to extrapolate their findings and conclusions to Tanzania, which had different contextual conditions. Consequently,

there existed a contextual research gap concerning the impact of automating the tax system on the performance of tax revenue collection in Tanzania. This study aimed to address the research gap by examining the correlation between customs system automation and the performance of tax revenue collection in the Kilimanjaro region of Tanzania.

2.5 Conceptual Framework

As indicated in the technological determinism theory, technological innovations have the ability to bring about societal change. Empirical studies have also reported that modernisation of taxation infrastructure (both hard and soft) have significant impact on tax revenue collection performance. This study, therefore, conceptualizes that there is a cause-and-effect relationship between automation of customs system and tax revenue collection performance. Integrated Cargo Management Technology is the independent variable represented by three variables, electronic cargo tracking system, cargo scanner technology and valuation system. These three predictor variables are conceptualised to affect customs revenue collection performance which is the outcome variable. This relationship is demonstrated in figure 1.

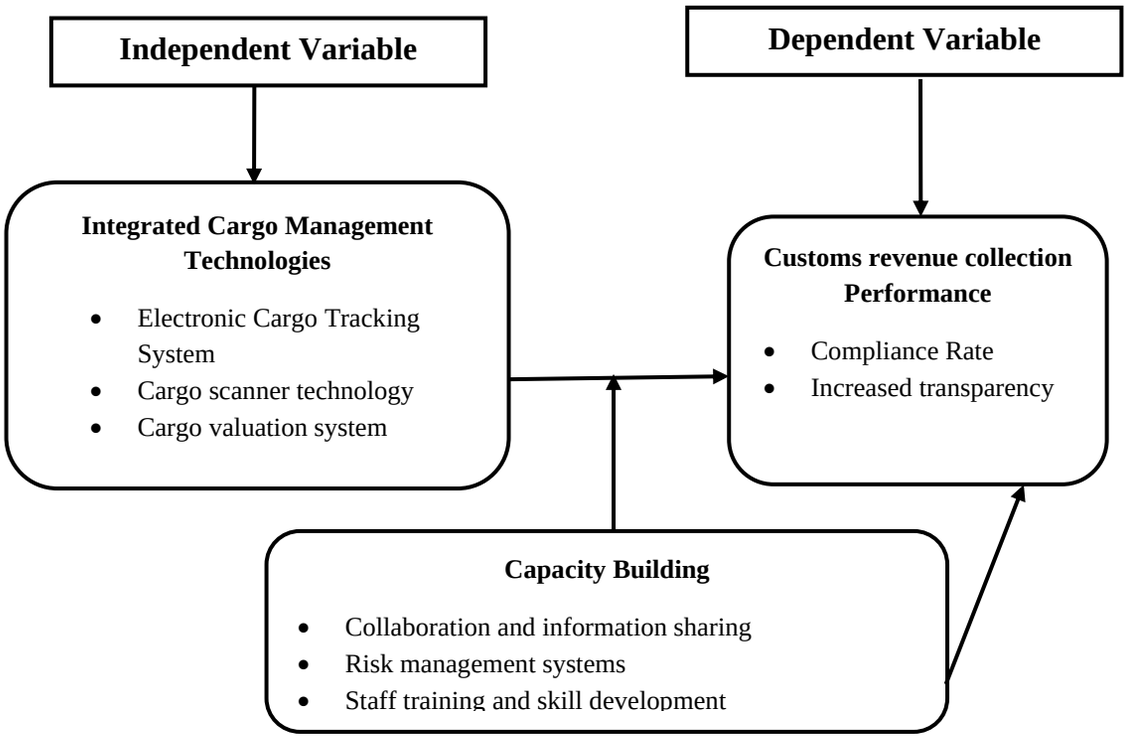


Figure 1: Conceptual Framework

Source: Student Own Construction (2023)

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The study used a cross-sectional design because it is survey research. The design is adopted since it allows collection of data at a single point in time. Therefore, the design allowed for the determination of causal-effect relationships between independent variables and the dependent variable. In addition, the design allowed easy data collection and analysis on the effect of customs system automation on revenue collection performance.

3.2 Geographical Coverage

The study was conducted at Tarakea, Holili one stop border post, and Kilimanjaro airport. Tarakea and Holili were chosen as border posts that connect Kenya and Tanzania, serving as the main channels for importing and exporting goods Tanzania from Kenya, a leading trade partner in the East African region (The Citizen, 2022). Holili OSBP is situated 41 kilometres East of Moshi town, with coordinates latitude 3° 22' 49.0" South and longitude 37° 38' 28.0" East. Tarakea is relatively small border post between Kenya and Tanzania, is located at coordinates latitude 3° 3' 59.27" South and longitude 37° 21' 2.40" East. Kilimanjaro International Airport was selected due to its status as the second largest and busiest airport, handling approximately 20% of air cargo in Tanzania (Kilimanjaro Airport Development Company, 2022). The airport's coordinates are latitude 3° 25' 37.02" South and longitude 37° 4' 29.69" East.

3.3 Target Population

The target population of the study consisted of customs officials and clearing agents who worked at Tarakea, Holili, and Kilimanjaro airport. As of 2023, there were 28, 41, 34 customs officials and 35,48, 32 clearing agents at Tarakea, Holili OSBP and KIA respectively. As such, the target population were comprised 218 customs officials and clearing agents of various ranks spread across the three customs stations.

3.4 Sample Size and Sampling Techniques

3.4.1 Sample Size

The research did not include all customs officials and clearing agents in the study area. Yamane's (1967) formula was used to obtain the sample size. Since the research

population was known, the formula was applied. Each customs station was assigned a proportionate number of respondents.

$$n = \frac{N}{1 + Ne^2} \quad \text{……..(1)}$$

Whereby, 'N' represented the total population, 'n' signified the estimated sample size, and 'e' stood for the standard error. In this study, a standard error of 0.05 (or 5%) was utilized to calculate an appropriate sample size of participants. Furthermore, the confidence level for this study was set at 95%. This framework established the basis for selecting a representative sample that would yield statistically meaningful results within the specified confidence interval. The sample size was 141.

3.4.2 Sampling Techniques

The study employed simple random sampling, involving randomly selecting participants from the population. This sampling ensured every unit had an equal chance of being chosen, to provide a representative sample. The random number generator was used that based entirely on chance and numbers were assigned to whole population. Furthermore, cluster-sampling technique employed. The cluster sampling technique was essential as the population consisted of diverse sub-groups, including customs officials and clearing agents in various locations, making it challenging to achieve representativeness.

3.5 Types and Sources of Data

3.5.1 Types of Data

The study utilized both qualitative and quantitative data. The two types of data were used since some objectives of the study could not be achieved when only one type of data was used. As explained by Edmond and Kennedy (2016), using qualitative and quantitative data enabled the study to generate detailed data that comprehensively responded to all the research questions.

3.5.2 Sources of Data

The study collected data from primary and secondary sources, which involves the collection of data directly from the respondents who participated in the study. The choice to use primary data, as elaborated by Edmonds and Kennedy (2016), was made to ensure that the data collected was current and accurate, and tailored to the study objectives.

Secondary data was collected to compare customs revenue collection before and after automation starting from 2002 to 2023.

3.6 Methods for Data Collection

3.6.1 Survey Questionnaire

The questionnaire administration followed a systematic approach for comprehensive data collection. The survey was then distributed to the targeted respondents, including customs officials and clearing agents, in a self-administered format for convenience and optimal response rates. This flexibility aimed to remove potential time and location constraints, ultimately contributing to a more representative dataset. Clear instructions and contact information were provided to address any queries or concerns during the questionnaire completion process, emphasizing the importance of a meticulous administration process in ensuring the data's quality and reliability. The questionnaire's structure, divided into six distinct sections, was outlined in the provided appendix (ii). This approach not only allowed for effective data collection but also proved to be cost-effective, particularly valuable when working with a large sample size and limited budget, as supported by literature (Hay, 2016; Creswell, 2016).

3.6.2 Key Informant Interviews

The study conducted key informant interviews (KII) to gain clarity on issues that could not be exhaustively covered in the survey questionnaire. Ten officers, including three (principal customs officer, senior customs officer, and customs officer I) from each customs station and one from the anti-smuggling unit, were included in the KIIs. An appointment was pre-scheduled before conducting the interview. An interview was done to collect data from the key informants having questions for respective objectives. Further, a total of eight interviews were conducted, the selection of the top leadership of the customs station was based on their experience and knowledge in customs operations. The KII interview guide, as shown in appendix (iii), was utilized during the interviews.

3.6.3 Documentary Review

Tax collection statistics Kilimanjaro regional report for the last 18 years starting from 2002 to 2023.

3.7 Data analysis

3.7.1 Determine the effect of integrated cargo management technologies on customs revenue collection performance

Multiple regression model was used to determine the effect of integrated cargo management technologies on customs revenue performance. The customs revenue collection performance was measured in term of compliance rate and increased transparency. Electronic cargo tracking system, cargo scanner technology and cargo valuation system were independent variables.

$$Y = \alpha + \sum_{i=1}^{n} \beta_{iXi} + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Whereby;

Y represents the dependent variable (customs revenue collection performance) which measured by compliance rate and increased transparency),

α is the intercept (the value of Y when all the independent variables are equal to zero),

β_1 is the regression coefficient for the independent variable X_i, and ε is the error term. The model predicts the value of Y based on the values of the independent variable(s) xi, with the coefficients βi indicating the strength and direction of the relationship between Y and xi. The model assumes a linear relationship between Y and xi, and that the error term ε is normally distributed with a mean of zero and a constant variance.

3.7.2 Examine effects of capacity building on customs revenue collection performance

Multiple regression model was used to examine effects of capacity building on customs revenue collection performance (collaboration and information sharing and staff training and skills development). The dependent variable is customs revenue collection performance which measured by compliance rate and increased transparency.

$$Y = \alpha + \sum_{i=1}^{n} \beta_{iXi} + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

Whereby;

Y represents the dependent variable customs revenue collection performance interm of compliance rate and increased transparency,

α is the intercept (the value of Y when all the independent variables are equal to zero),

β_i is the regression coefficient for the independent variable X_i, and ε is the error term. The model predicts the value of Y based on the values of the independent variable(s) x1, with the coefficients β1 indicating the strength and direction of the relationship between Y and xi. The model assumes a linear relationship between Y and xi, and that the error term ε is normally distributed with a mean of zero and a constant variance.

3.7.3 Determine the moderating effect of capacity building on the relationship between integrated cargo management technologies and customs revenue collection performance.

Multiple regression model was used to determine the moderating effect of capacity building on the relationship between integrated cargo management technologies and customs revenue collection performance. It was believed to provide insights into the importance of incorporating capacity building initiatives alongside automation strategies to maximize the effectiveness of revenue collection processes in term of compliance rate and transparency.

$$crcp = \beta i(icmt) + \beta 2(cb) + \beta 3(icmt * cb + \varepsilon \text{.....} \ldots\ldots 3$$

Where:

CRCP represents customs revenue collection performance.

ICMT stands for integrated cargo management technologies.

CB represents capacity building.

β0 is the intercept.

βi, β_2, and β_3 are the regression coefficients for ICMT, CB, and the interaction term (ICMT × CB) respectively.

ε represents the error term, accounting for unexplained variance in CRCP.

3.7.4 Explore the challenges facing transition from the traditional to automated customs system.

Exploring the challenges facing transition from the traditional to automated customs system was done using descriptive statistical analysis from SPSS software. Descriptive statistical analysis employed the use of range and standard deviation to explore

challenges authority possess during the transition from traditional to automated customs system.

Table 1:Variables, definition of variable and unit of measurement

	Variables	Unit measurement	Definition of variable	Expected Sign
X1	Electronic Cargo Tracking System	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Working together, exchanging knowledge for mutual benefit and progress.	+
X2	Cargo scanner technology	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Strategies and processes for identifying and mitigating	+
X3	Cargo valuation system	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Method to assess value of transported goods for customs purposes.	+
X4	Collaboration and information sharing	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Working together, exchanging knowledge for mutual benefit and progress.	+
X5	Risk management systems	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Strategies and processes for identifying and mitigating potential organizational risks.	+
X6	Staff training and skill development	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Improving employee proficiency through training and skill enhancement programs.	+
X7	System breakdown	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Failure of a system to function as intended or expected.	+
X8	Political goodwill	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Support and cooperation from political authorities for positive initiatives or policies.	+
X9	Short-staffed	1=strongly disagree, 2=disagree 3= neutral 4=agree 5= strongly agree	Inadequate personnel; not enough staff to meet required demands.	+

3.8 Data Validity and Reliability

3.8.1 Reliability

Validity of the questionnaire was assessed through pre-testing, which involved measuring its accuracy and effectiveness. Based on the feedback and recommendations gathered from the pre-testing phase, necessary adjustments and improvements were made to the final questionnaire prior to data collection. The collected data underwent a reliability test, specifically the Cronbach's Alpha coefficient test. The results of this test, as presented in Table 2, demonstrated good consistency among all the Likert-type scale

questions, as indicated by Cronbach's Alpha values exceeding the accepted threshold of 0.7.

Table 2: Reliability test for Likert-type scale

Variable	Cronbach's Alpha	N of Items
Collaboration and information sharing	0.843	5
Risk management systems	0.891	5
Staff training and skill development	0.934	5
Political goodwill	0.933	5
Short-staffed	0.877	5
System breakdown	0.904	5
Electronic Cargo Tracking	0.927	5
Cargo scanner technology	0.940	5
Cargo valuation system	0.919	5
Compliance rate	0.834	5
Increased transparency	0.840	5

3.8.2 Data Validity

A content validity test was performed on the questionnaire and the interview guide to determine the number of items that captured what the study intended to measure. Requesting experts to review and make recommendations on the reconstruction of poorly phrased questions did this or the deletion of questions not related to the study objectives. A content validity index (CVI), determined by dividing the number of valid questions by the number of total questions, and was used to test content validity. According to Amini (2005), a CVI above 0.5 was highly recommended.

3.9 Ethical consideration

The researcher adhered to basic principles of ethics in social science researchers. The researcher obtained a letter for data collection from Moshi Co-operative University (MoCU) to Tanzania Revenue Authority in Kilimanjaro Region. During data collection, the researcher provided the research permit and identification card to key informants for acceptance, asked for consent and willingness of the respondents and explained the main theme for conducting the study, ensured the respondents about confidentiality and clarified the use of provided information.

CHAPTER FOUR

4.0 FINDINGS AND DISCUSSION

4.1 Demographic Characteristics

4.1.1 Gender of Respondents

Out of the total 141 participants, 84 (59.6%) were male, and 57 (40.4%) were female. This indicates that there was a higher representation of males in the study compared to females. The sex distribution of the participants is significant in the context of the study's objectives. It suggests that there may be gender-based differences in perceptions, attitudes, and experiences related to the effect of customs system automation on revenue collection performance.

Table 3: Demographic Characteristics

Variables	Category	Frequency	Percent
Sex	Male	84	59.6
	Female	57	40.4
	Total	141	100
Education level	Secondary education	19	13.5
	Diploma	44	31.2
	Degree	55	39
	Masters	23	16.3
	Total	141	100
Age of Respondent	19-35	29	20.6
	36-55	83	58.9
	Above 55	29	20.6
	Total	141	100

4.1.2 Education level of Respondent

The findings show that out of the total 141 participants, 19 (13.5%) had a secondary education, 44 (31.2%) had a diploma, 55 (39.0%) had a degree, and 23 (16.3%) had a master's degree. The study examined the education levels of participants in the Customs Department in Kilimanjaro Region, Tanzania, regarding the effect of customs system automation on revenue collection performance. The data revealed that the majority of the 141 participants had higher levels of education, with degrees being the most common qualification. This suggests that the study engaged individuals with a strong educational background, which enhances the quality of the collected data. Analyzing education levels is relevant to understand relationship between perceptions, understanding, and performance in the context of customs system automation and revenue collection. Participants with higher education may possess a deeper understanding of the technological aspects of automation, providing valuable insights into its effectiveness.

By considering education levels, the study can explore how qualifications influence attitudes and skills related to customs system automation, identifying potential patterns or variations based on educational background.

4.1.3 Age of Respondent

The minimum age recorded was 19 years, while the maximum age recorded was 60 years. On average, the respondents' age was 36-55 years. The average age of the participants was 36-55 years. The age distribution of the participants is significant as it can help uncover potential differences in perceptions and attitudes towards automation based on age. Younger participants may have different technological skills and expectations compared to older participants, which could impact their acceptance and utilization of customs system automation. Considering the age demographics allows for a comprehensive assessment of how age influences the perception and adoption of automation, ultimately affecting revenue collection performance in the Customs Department. The findings related with the findings by Sen *et al.* (2022) have shown that younger individuals tend to be more familiar and comfortable with technology, possessing higher technological skills and expectations compared to older individuals. This suggests that younger participants in the study, who may be more technologically savvy, could have a more positive attitude towards customs system automation and may be more likely to adopt and utilize it effectively.

On the other hand, older participants might exhibit varying levels of familiarity and comfort with technology, potentially leading to different perceptions and attitudes towards automation as revealed by Miller *et al.* (2022) that older individuals may have lower levels of technology acceptance due to factors such as limited experience and resistance to change.

4.1.4 Multiple Regression Assumptions

4.1.4.1 KMO and Bartlett's Test

Quantitative data was analyzed using multiple linear regression to investigate the impact of various variables on the customs revenue collection performance in relation to the revenue automation system. The study consisted of 55 items, and factor analysis was employed to identify coherent subsets of variables that were relatively independent of each other. The aim of factor analysis was to reduce the 55 variables into smaller sets of uncorrelated variables. Additionally, factor analysis was used to determine the number

of dimensions present in the variable set. The 11 variables included in the analysis were collaboration and information sharing, risk management systems, staff training and skill development, political goodwill, short-staffed, system breakdown, electronic cargo tracking, cargo scanner technology, cargo valuation system, compliance rate, and increased transparency. The suitability of the data for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) and Bartlett tests, with the results presented in Table 2. It was found that all 11 variables were suitable for factor analysis, as evidenced by KMO values greater than 0.5 (0.766) and significant p-values for the Bartlett tests (p = 0.000).

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.766**
Bartlett's Test of Sphericity	Approx. Chi-Square	695.134
	Df	55
	Sig.	.000

4.1.4.2 Multicollinearity

Multicollinearity refers to the correlation between independent variables in a regression analysis (Shrestha, 2020). In regression, it is generally recommended to avoid high correlations among independent variables. Multicollinearity occurs when the independent variables in the data are highly correlated with each other. One way to assess multicollinearity is by examining the Variance Inflation Factors (VIFs). VIFs of around one indicate little to no multicollinearity, while VIFs between one and five suggest moderate correlation. VIFs between five and ten indicate high correlation, and VIFs greater than ten with a tolerance less than 0.2 suggest a severe multicollinearity problem, where coefficients are poorly estimated. In the present study, the multicollinearity was found to be equal to one, and the tolerance levels were greater than 0.2, indicating the absence of a multicollinearity problem, as shown in Table 3.

Table 5: Multicollinearity Test

Variables	**Tolerance**	**VIF**
Collaboration	.817	1.224
Risk management	.924	1.083
Staff training	.781	1.28
Political will	.538	1.86
Short-staffed ed	.736	1.358
System breakdown	.572	1.748

4.2 The Effect of integrated cargo management technologies on Revenue Collection Performance

The objective of this section was to examine the impact of integrated cargo management technologies on customs revenue collection performance. Customs system automation refers to the implementation of technological tools and processes to streamline and improve customs operations. The efficiency and effectiveness of customs revenue collection play a vital role in government finances and trade facilitation. Therefore, understanding the effects of automation on revenue collection performance is crucial for policymakers and stakeholders involved in customs administration. By analyzing relevant data and statistical techniques, this section aims to provide insights on how integrated cargo management technologies influence revenue collection performance, including factors such as compliance rate and increased transparency.

4.2.1 The Effect of integrated cargo management technologies in term of Compliance Rate

Considering integrated cargo management technologies the multiple regression model on compliance rate that was built and shown in Table 6 below indicates that the electronic cargo tracking system has an impact on compliance rate ($p< 0.05$). Whereas the average compliance rate increases by 0.2 units for every unit increase in the electronic cargo tracking system. While cargo valuation systems and scanning technology have little to no impact on compliance

Table 6: The Effect of Integrated cargo management technologies in term of Compliance Rate

Variable	Coeffient	t	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Electronic Cargo Tracking System	0.2	3.121	0.002	0.073	0.327
Cargo scanner technology	-0.124	-0.665	0.507	-0.492	0.244
Cargo valuation system	0.249	1.314	0.191	-0.126	0.624

R Square = 0.660, adjusted R Square = 0.585 Number of observation (N) = 141, **statistically significant at $P < 0.01$,

The findings in Table 6 suggest that the electronic cargo tracking system plays a crucial role in enhancing compliance. It implies that the system provides mechanisms or features that facilitate or incentivize compliance among relevant stakeholders. Furthermore, the findings indicate that the electronic cargo tracking system has various features that might contribute to enhancing compliance, including real-time monitoring, electronic documentation, automated alerts, and improved communication channels.

The system improves transparency, accountability, and traceability, making it difficult for non-compliant activities to go unnoticed. The findings reflect the principles of Technological Determinism theory, which posits that technology plays a significant role in shaping and influencing human behavior and societal outcomes. In this case, the electronic cargo tracking system is seen as a technology that has a direct impact on compliance. The features and mechanisms provided by the system, such as real-time monitoring, electronic documentation, and automated alerts, act as drivers for compliance among stakeholders. These technological capabilities enhance transparency, accountability, and traceability, creating an environment that discourages non-compliant activities. The findings suggest that the system itself, through its technological affordances, influences and shapes the behavior of users and contributes to improving compliance rates.

Also the findings supported with various scholars such as Chen *et al.* (2020) conducted a study in the logistics industry in Ghana and found that companies that implemented electronic tracking systems experienced higher levels of compliance with regulatory requirements. The real-time monitoring and documentation features of the systems were identified as key factors in improving transparency and accountability, leading to increased compliance. Also Sindi and Woodman (2021) conducted a similar study and observed that the implementation of electronic cargo tracking systems resulted in improved compliance rates. The study highlighted the effectiveness of automated alerts and improved communication channels in detecting and preventing non-compliant activities. The researchers concluded that these features played a significant role in enhancing compliance and reducing instances of fraud and smuggling. Odago *et al.* (2021) investigated the impact of electronic cargo tracking systems on compliance. Their findings demonstrated that the implementation of such systems led to increased compliance rates and reduced instances of non-compliance. The electronic documentation and traceability features were identified as crucial in promoting compliance among importers, exporters, and customs authorities also reflected with the study by Hrouga *et al.* (2022) examined the impact of electronic tracking systems on compliance in the logistics industry. The results showed that companies that implemented such systems experienced higher levels of compliance with regulatory requirements compared to those without such systems. The real-time monitoring and

documentation features of the electronic tracking systems were found to improve transparency and accountability, leading to increased compliance.

Similarly, a study conducted by Tan and Sundarakani (2021) in the maritime industry found that the implementation of electronic cargo tracking systems led to improved compliance rates. The study highlighted the effectiveness of automated alerts and improved communication channels in detecting and preventing non-compliant activities. The researchers concluded that these features of the electronic tracking systems played a significant role in enhancing compliance and reducing instances of fraud and smuggling. Another relevant study by Mwelu (2021) investigated the impact of electronic cargo tracking systems on compliance in the customs and border control context. The findings revealed that the implementation of such systems resulted in increased compliance rates and reduced instances of non-compliance. The electronic documentation and traceability features of the systems were identified as key factors in promoting compliance among importers, exporters, and customs authorities. Furthermore, the key informant supported that

> ‘’…….. *the automated alerts provided by the system is the valuable tool in promoting compliance. The system programmed to generate alerts for any suspicious or non-compliant activities, allowing authorities to intervene and investigate potential violations promptly. These alerts serve as deterrents to illicit practices and encourage stakeholders to adhere to the prescribed rules and regulations……’’* (Holili OSBP: 09 May, 2023*)*

> Another added that ……. *Our system allows for seamless information sharing between different stakeholders, including customs officials, shipping agents, and transport operators. This enhanced communication enables collaborative efforts in ensuring compliance, as stakeholders can exchange real-time data, coordinate actions, and address any concerns or discrepancies promptly…’’* (Tarakea: 17 May,2023).

Thus it is important of allocating resources towards electronic cargo tracking systems in order to bolster compliance

The cargo scanner technology and cargo valuation system variables do not show a statistically significant eff**e**ct on the compliance rate. The beta coefficient for cargo scanner technology is -0.124, indicating a negative relationship, but the t-value of -0.665 and the high p-value of 0.507 suggest that this relationship is not significant. Similarly, the cargo valuation system has a beta coefficient of 0.249, indicating a positive relationship, but the t-value of 1.314 and p-value of 0.191 indicate that this relationship is also not statistically significant. These findings indicate that, within the context of the study, the implementation or improvement of cargo scanner technology and the cargo valuation system may not be key drivers of compliance within the customs system and these findings contradict the principles of Technological Determinism theory. According to Technological Determinism, technology is believed to have a direct and significant impact on shaping human behavior and societal outcomes. One key informant stated that

> "……. *while cargo scanner technology is a useful tool for identifying potential risks and contraband, its impact on overall compliance is limited. Compliance is more influenced by factors such as effective training and enforcement measures*……..."(KIA: 29,May 2023)

> Another informant mentioned that
> "……*the cargo valuation system, although important for ensuring accurate assessment of duties and taxes, does not directly impact compliance. Compliance is driven by other factors such as the regulatory framework, monitoring mechanisms, and the behavior and motivation of stakeholders*……."(Holili OSBP: 10 May,2023)

The study conducted by Venkatesh *et al.* (2020) examined the determinants of compliance behavior among importers. The findings revealed that while technology, such as electronic systems and automation, played a role in facilitating compliance, other factors such as the clarity of regulations, effective enforcement, and the attitudes and beliefs of importers were also significant contributors to compliance outcomes. Similarly, a study by Cui *et al.* (2019) explored the factors influencing compliance with customs regulations in the context of cross-border e-commerce.

The researchers found that while technological solutions, such as electronic data interchange and risk management systems, contributed to compliance, other factors such as trust in the regulatory environment, the responsiveness of customs authorities, and the availability of supportive infrastructure were also crucial in determining compliance levels. Furthermore, a study conducted by Ermasova *et al.* (2021) investigated compliance behavior in the context of tax evasion. The findings indicated that technological tools, such as electronic filing and digital audit trails, had a positive impact on compliance, but their effectiveness was contingent upon complementary factors such as fair enforcement, clear communication, and the perceived fairness of the tax system.

4.2.2 The Effect in Term of Increased Transparency

The electronic cargo tracking system has an impact on increased transparency, as shown by Table 7 multiple regression model, which was fitted and shows this effect ($p< 0.05$). Increased electronic freight tracking results in a 0.16-unit loss in increased transparency on average for every one-nit increase. Contrary to popular belief, increased transparency is not much impacted by cargo scanner technology or cargo value systems.

Table 7: The Effect in Term of Increased Transparency

Variable	β	T	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Electronic Cargo Tracking System	-0.161	-2.811	0.006	-0.275	-0.048
Cargo scanner technology	0.176	1.056	0.293	-0.154	0.507
Cargo valuation system	-0.253	-1.489	0.139	-0.589	0.083

R Square = 0.827, adjusted R Square = 0.674, Number of observation (N) = 141, **statistically significant at $P < 0.01$,

The findings from Table 7 reveal that the variable "Electronic Cargo Tracking System" has a statistically significant negative effect on increased transparency within the customs system. This means that as the implementation or utilization of electronic cargo tracking systems increases, there is a corresponding decrease in transparency. The negative effect of the "Electronic Cargo Tracking System" variable on increased transparency suggests that as electronic cargo tracking systems are implemented or utilized more extensively, transparency within the customs system decreases. Transparency is crucial for revenue collection performance as it ensures that all transactions, assessments, and payments are conducted openly and in accordance with regulations. It allows for effective monitoring and auditing of revenue-related activities, reducing the potential for fraud, corruption, and revenue leakage.

The decrease in transparency associated with the implementation or utilization of electronic cargo tracking systems raises concerns regarding the accuracy and reliability of revenue collection. Without adequate transparency, there is a higher risk of undervaluation, misclassification, or manipulation of cargo information, which can lead to revenue losses for the government. Study in Indonesia: A study conducted by Gurning (2019) in Indonesia explored the impact of electronic cargo tracking systems on customs processes and transparency. The findings revealed that the implementation of such systems improved efficiency and reduced administrative delays. However, the study also highlighted challenges related to transparency. It emphasized the need for continuous monitoring and evaluation of the system's transparency aspects to ensure that it aligns with the government's revenue collection objectives.

By Hanrahan *et al.* (2019) examined the implementation of electronic cargo tracking systems in South Africa. The research highlighted that while these systems improved efficiency and risk management, there were concerns about transparency in revenue collection. The study emphasized the importance of establishing strong governance mechanisms and transparency measures to address potential issues arising from the use of technology in customs processes. Also the study by Kuteyi and Winkler (2022) in Brazil explored the impact of electronic cargo tracking systems on customs operations and transparency. The study found that while these systems facilitated automation and reduced processing times, there were challenges related to transparency and integrity in revenue collection. It emphasized the need for comprehensive controls and auditing mechanisms to ensure transparency and prevent revenue leakage. Also the key informant added that

> ‘’……*while electronic cargo tracking systems streamline processes and improve risk management, there is a need for careful attention to transparency. The digitization of customs procedures are accompanied by training programs for our staff to address any potential abuses or manipulation of data….* (Tarakea: 19 May,2023).

Therefore, can be argued that the implementation or utilization of electronic cargo tracking systems holds promise for enhancing transparency and efficiency in revenue collection practices. Thus, the transparency concerns need to be addressed through monitoring, evaluation, governance mechanisms, and comprehensive controls to

maintain the accuracy and reliability of revenue collection processes in customs revenue collection.

The study findings indicate that Cargo scanner technology and Cargo valuation system do not have relationship with increased transparency in the customs system. This implies that the implementation or enhancement of these technologies may not be crucial factors driving transparency. It is important to recognize that while these technologies may have value in other aspects of customs operations, their direct impact on transparency may be limited in the specific context of this study. Nonetheless, their contributions to efficiency, risk management, and revenue assessment accuracy should not be overlooked. These findings contradict the principles of Technological Determinism theory, which posits that technology has a direct and significant impact on shaping human behavior and societal outcomes. According to Technological Determinism, the implementation or enhancement of Cargo scanner technology and Cargo valuation system would be expected to have a clear and positive influence on increased transparency in the customs system. While the study findings supported by For instance, a study conducted by Kibiy (2020) in Portugal examined the impact of cargo scanner technology on customs operations and transparency. The findings revealed that while the implementation of cargo scanner technology improved efficiency and risk management, it did not have a significant impact on transparency. The study highlighted the importance of complementary measures, such as effective governance and transparency mechanisms, to ensure transparency in customs processes. Similarly, a study by Dere (2021) in Bangladesh investigated the effect of Cargo valuation system on revenue transparency in customs operations. The results indicated that while the implementation of the Cargo valuation system contributed to accurate assessment of duties and taxes, it did not have a direct influence on overall transparency.

4.2.3 The Effect of Capacity Building on Customs Revenue Collection Performance

This section focuses on investigating the influence of capacity building on the performance of customs revenue collection. Capacity building involves enhancing the knowledge, skills, and resources of individuals and organizations involved in customs operations. Through capacity building initiatives, customs authorities strive to enhance their operational efficiency and effectiveness in revenue collection. This section examines the impact of various capacity building measures, including collaboration and information sharing, risk management systems, and staff training and skill development,

on customs revenue collection performance. The analysis aims to provide insights into the significance of capacity building in achieving optimal revenue outcomes and to offer guidance to policymakers and practitioners regarding strategies that can contribute to improved customs revenue collection.

4.2.4 The Effect of Capacity Building in Term of Compliance Rate

Capacity building indicated by Collaboration and information sharing in customs revenue collection process, Risk management systems and Staff training and skill development. Increased efficiency and timeliness in the customs revenue collection process have an impact on compliance rate, as shown in Table 8 below ($p< 0.05$). The average compliance rate increases by 0.22 units for every one-unit improvement in Additionally, the compliance rate is impacted by fewer complaints after automation ($p< 0.05$). The average compliance rate increases by 0.16 units for every unit decrease in complaints after automation. Additionally, the compliance rate is impacted by decreased manual data entry ($p< 0.05$). The average compliance rate increases by 0.16 units for every unit decrease in manual data entry.

Table 8: The Effect of Capacity Building in Term of Compliance Rate

Variable	β	t	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Collaboration and information sharing	0.229	2.971	0.004	0.077	0.381
Risk management systems	0.161	2.287	0.024	0.022	0.3
Staff training and skill development	0.153	2.51	0.013	0.033	0.274

R Square = 0.714, adjusted R Square = 0.695, Number of observation (N) = 141, **statistically significant at $P < 0.01$,

The finding informs that collaboration and information sharing have a statistically significant positive effect on compliance rate. Effective collaboration and information sharing between customs administrations and relevant stakeholders, such as other government agencies, international organizations, and private sector entities, are seems to be crucial for ensuring compliance in revenue collection. The findings align with the principles of Systems Theory. Systems Theory emphasizes the interconnectedness and interdependence of various components within a system, highlighting the importance of collaboration and information flow among these components. The study findings supported with the study conducted by Lisinge (2020) in China examined the impact of collaboration and information sharing on customs compliance. The research found that customs administrations that actively collaborated with other government agencies and

shared information experienced higher levels of compliance from importers and exporters. The study highlighted the importance of effective coordination and communication between customs and relevant stakeholders in achieving compliance goals. Similarly, a study by Kim and Kim, (2020) in the Korea investigated the role of collaboration and information sharing in customs operations. The findings demonstrated that customs administrations that engaged in regular information exchange and collaboration with industry associations and trade organizations had higher compliance rates. The study emphasized the significance of building strong partnerships and promoting transparent communication channels for enhancing compliance in revenue collection.

Another study by Faúndez-Ugalde *et al.* (2020) examined the impact of collaboration and information sharing on compliance rates in customs administrations across Latin American countries. The research revealed a positive relationship between effective collaboration mechanisms, such as joint training programs and information sharing platforms, and compliance levels. The study highlighted the need for customs administrations to establish robust networks and foster collaborative relationships with stakeholders to improve compliance in revenue collection. When customs administrations collaborate and share information with other stakeholders, it promotes a coordinated and integrated approach to customs operations. This enables better identification and management of risks, enhances the exchange of intelligence and data, and facilitates the implementation of targeted compliance measures. By working together, customs administrations and stakeholders can leverage their collective resources and expertise to address compliance challenges more effectively, therefore, improved collaboration and information sharing also foster trust between customs administrations and stakeholders.

The findings on risk management capacity building emphasize the importance of effective risk management systems in promoting compliance in revenue collection. By implementing robust risk management systems, customs administrations can proactively identify and address compliance risks, thereby reducing the likelihood of non-compliance. This includes measures such as enhanced monitoring, targeted inspections, and internal controls to ensure transactions align with regulations. The positive relationship between risk management systems and compliance rate indicates that prioritizing comprehensive risk management leads to higher compliance levels,

fostering an environment of adherence, trust, and cooperation between customs authorities and stakeholders. Risk management systems play a crucial role in customs revenue collection by identifying and mitigating compliance risks. By implementing robust risk management practices, customs administrations can enhance monitoring, conduct targeted inspections, and establish internal controls to ensure compliance with regulations.

The positive relationship between risk management systems and compliance rate highlights the importance of prioritizing comprehensive risk management. Such systems enable customs administrations to effectively manage risks, reducing the likelihood of non-compliance and fostering an environment of adherence to regulations the study findings supported by key informant

> "…….*As risks and compliance challenges evolve, it is crucial to regularly update and improve risk management systems. This requires ongoing training for staff and keeping up with emerging trends and technologies that may pose new risk……"* (Holili OSBP: 10,May 2023).

> Another key informant added that
> "……..*Risk management capacity building allows customs administrations to be able prioritize their resources and focus on areas of higher risk. By allocating resources effectively and conducting targeted inspections, customs can enhance their compliance efforts and improve revenue collection outcomes"* (Tarakea: 19 May, 2023).

Thus, continuous capacity building efforts, including staff training and staying updated with emerging risks and technologies, are crucial to maintaining effective risk management practices. By proactively managing risks, customs administrations can allocate resources efficiently, conduct targeted inspections, and create an environment that encourages compliance and adherence to regulations. Overall, effective risk management capacity building plays a vital role in enhancing revenue collection outcomes and ensuring the integrity of customs operations.

The findings on the effect of staff training and skill development on compliance rate are significant in highlighting the importance of investing in human capital within customs administrations. It seems that staff training and skill development play a crucial role in enhancing the knowledge, capabilities, and competencies of customs officers involved in revenue collection processes. By providing comprehensive training programs, customs administrations can equip their staff with the necessary skills and knowledge to effectively carry out their duties and responsibilities. This includes understanding relevant regulations, procedures, and best practices for revenue collection, as well as developing expertise in areas such as risk assessment, valuation, classification, and fraud detection. Furthermore, the positive relationship observed between staff training and skill development and compliance rate suggests that well-trained and competent staffs are more likely to adhere to regulatory requirements and carry out their tasks accurately and efficiently.

They are better equipped to identify potential compliance risks, handle complex transactions, and make informed decisions that contribute to improved compliance outcomes. A study by Wheat *et al.* (2019) conducted in South Africa found that staff training programs focusing on customs procedures and regulations significantly improved compliance rates. The study highlighted that well-trained customs officers were more knowledgeable about relevant laws and regulations, leading to better decision-making and reduced instances of non-compliance. Similarly, research conducted by Omido and Kasibo (2021) in Kenya demonstrated that comprehensive training programs for customs officers positively influenced compliance behaviors. The study revealed that officers who received training on risk assessment, valuation techniques, and fraud detection were more effective in identifying and addressing compliance risks, resulting in improved revenue collection performance.

4.2.5 The Effect of Capacity Building in Term of Increased Transparency

Less manual data entry has an impact on increased transparency, as seen in Table 9 multiple regression model ($p< 0.05$). Collaboration and information sharing results in an average 0.12-unit decrease in increased transparency for every unit that it is increased. While Risk management systems following automation and Staff training and skill development in the customs revenue collection process do not significantly affect increased transparency.

Table 9: Effect of Capacity in Term of Increased Transparency

Variable	Coefficient	T	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Collaboration and information sharing	-0.116	-1.526	0.129	-0.267	0.034
Risk management systems	-0.017	-0.247	0.806	-0.155	0.121
Staff training and skill development	-0.176	-2.91	0.004	-0.295	-0.056

R Square = 0.781, adjusted R Square = 0.762, Number of observation (N) = 141, **statistically significant at $P < 0.008$,

These findings imply that, based on the data and analysis conducted in this study, neither collaboration and information sharing nor risk management systems have a significant impact on increased transparency in customs revenue collection. It seems that their influence on transparency outcomes may be limited within the specific context of this study. Similarly, the presence of risk management systems alone may not lead to substantial improvements in transparency. These results suggest that there may be other influential factors at play in determining the level of transparency within customs operations. The findings are in line with the study by Kim and Kim (2020) examined the impact of collaboration between customs administrations and other stakeholders on transparency in customs procedures. They found that effective collaboration and information sharing improved transparency by enhancing communication, coordination, and mutual understanding among stakeholders.

Similarly, a study by Guthrie *et al.* (2020) investigated the role of risk management systems in promoting transparency in customs operations. They found that well-designed risk management systems, coupled with appropriate control mechanisms, contributed to increased transparency by identifying and addressing compliance risks. On the other hand, there are studies that have also highlighted the complex nature of transparency in customs operations. For instance, a study by Janssen *et al.* (2020) emphasized that transparency is influenced by a multitude of factors, including governance structures, legal frameworks, and organizational culture. Thus, collaboration and risk management systems are important components, their impact on transparency may be contingent on other contextual factors.

The findings in Table 9 indicate that within the context of this study, staff training and skill development have a significant negative impact on transparency in customs revenue collection. However, it is important to consider these results in conjunction with

other factors and conduct further research to understand the underlying reasons for this relationship and explore potential solutions to improve transparency in customs operations. The findings regarding the negative impact of staff training and skill development on transparency in customs revenue collection can be interpreted through the lens of Systems Theory. According to Systems Theory, organizations are viewed as interconnected systems with various elements that influence each other's behavior and outcomes. In this case, customs operations can be seen as a system where different elements, such as staff training, policies, procedures, and technological infrastructure, interact to shape transparency outcomes.

The negative relationship observed between staff training and transparency suggests that there may be underlying factors within the system that contribute to this outcome. It is possible that the training provided to staff may not be adequately addressing the specific needs and challenges related to transparency. There could be systemic issues such as ineffective communication channels, organizational culture, or lack of accountability mechanisms that hinder the translation of staff training into improved transparency outcomes. Systems Theory emphasizes the importance of considering the broader context and interdependencies within a system. While staff training is an essential component, it should be viewed in conjunction with other factors that influence transparency in customs operations. Further research is needed to explore these interdependencies and identify potential solutions to improve transparency.

Also the study findings supported by Adam (2020) examined the impact of training on transparency in public sector organizations and found mixed results. While some training programs were found to enhance transparency by equipping employees with the necessary skills and knowledge, other programs had limited or even negative effects. The authors suggested that the effectiveness of training in promoting transparency depends on factors such as the content and quality of training, organizational culture, and leadership support. Similarly, a study by Felzmann *et al.* (2019) investigated the relationship between training and transparency in the healthcare industry. They found that although training programs improved employees' knowledge and skills.

4.3 Moderating Effect of Capacity Building

In this section, a researcher examines the moderating effect of capacity building on the relationship between integrated cargo management technologies and customs revenue collection performance. Capacity building refers to the process of enhancing the

knowledge, skills, and resources of individuals and organizations involved in revenue collection activities. By investigating the moderating role of capacity building, aimed to understand how specific capacity building measures, such as training programs, collaboration and information sharing initiatives, and risk management systems, influence the impact of customs system automation on revenue collection performance. The objective is to provide insights into the importance of incorporating capacity building initiatives alongside automation strategies to maximize the effectiveness of revenue collection processes in term of compliancy rate and transparency.

4.3.1 Moderating Effect of Capacity Building in Term of Compliance Rate

To determine the moderating effect of capacity building on the relationship between integrated cargo management technologies and revenue collection performance in term of compliance rate, the coefficients of the capacity building variables in the multiple regression model can provide insights. Capacity building measures, such as Collaboration and Information Sharing, Risk Management Systems, and Staff Training and Skill Development, play a moderating role in the relationship between integrated cargo management technologies and compliance rate. Considering integrated cargo management technologies, the multiple regression model on compliance rate that Table 10 demonstrates the multiple regression model that was fitted and demonstrates the impact on compliance rate ($p < 0.05$) of the electronic cargo tracking system, cargo scanner technology, cargo valuation system, increased efficiency and timeliness in the customs revenue collection process, fewer complaints post-automation, and less manual data entry. The average compliance rate increases by 0.416, 0.533, 0.247, 0.192, and 0.248 units, respectively, because of improvements in the electronic cargo tracking system, the cargo valuation system, the efficiency and timeliness of the customs revenue collection process, the Collaboration and information sharing, and Risk management systems. In addition, every additional unit of cargo scanner technology result in a 0.54 percent reduction in compliance rates on average.

Table 10: Moderating Effect of Capacity Building in Term of Compliance Rate

Variable	B	t-test	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Electronic Cargo Tracking System	0.416	5.387	0.000	0.220	0.475
Cargo scanner technology	-0.535	-7.472	0.000	-0.548	-0.319
Cargo valuation system	0.533	7.431	0.000	0.328	0.566
Collaboration and information sharing	0.247	3.005	0.003	0.082	0.395
Risk management systems	0.192	2.302	0.023	0.024	0.314
Staff training and skill development	0.248	3.024	0.003	0.065	0.313

R Square = 0.763, adjusted R Square = 0.632, Number of observation (N) = 141, **statistically significant at $P < 0.001$,

The findings suggest that capacity building measures have a moderating effect on the relationship between integrated cargo management technologies and compliance rate in revenue collection. Collaboration and Information Sharing, Risk Management Systems, and Staff Training and Skill Development all demonstrate positive coefficients, indicating their influence on enhancing compliance rate in conjunction with automation. Effective collaboration and information sharing practices, supported by automation systems, contribute to improved revenue collection outcomes. Robust risk management systems, when combined with automation, strengthen the relationship with compliance rate by identifying and mitigating risks. Investing in staff training and skill development, alongside customs system automation, improves compliance rate by equipping staff with the necessary knowledge and skills to effectively utilize automation systems.

These findings highlight the importance of incorporating capacity building initiatives alongside automation to maximize the benefits and improve revenue collection performance. As revealed by Kangave *et al.* (2020) examined the impact of collaboration and information sharing on compliance rate in customs revenue collection across Rwanda revenue collection authority. The findings revealed that increased collaboration, facilitated by automation systems, significantly improved compliance rate also a study by Mwila *et al.* (2019) informed that effectiveness of risk management systems in conjunction with customs system automation was investigated in Zambia medicine medical devices authority. The results indicated that the implementation of robust risk management practices, supported by automation, significantly enhanced compliance rate

4.3.2 Moderating Effect of Capacity Building in Term of Transparency

Table 11 demonstrates the multiple regression model that was fitted and demonstrates the influence on increased transparency ($p < 0.05$) of the electronic cargo tracking system, cargo scanner technology, cargo valuation system, and Collaboration and information sharing. When the Electronic Cargo Tracking System is increased by one-unit, increased transparency decreases on average by 0.42 units. Additionally, every additional unit of cargo scanner technology result in an average improvement in transparency of 0.61 units. Additionally, a unit increase in the cargo valuation system

results in a 0.61-unit average drop in increased transparency. Additionally, for every unit increase in Risk management systems, increased transparency
decreases on average by 0.26 units..

Table 11: Moderating Effect of Capacity Building in Term of Transparency

Variable	B	t-test	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Electronic Cargo Tracking System	-0.417	-5.416	0	-0.455	-0.212
Cargo scanner technology	0.613	9.155	0	0.372	0.576
Cargo valuation system	-0.61	-9.074	0	-0.595	-0.382
Collaboration and information sharing	-0.151	-1.796	0.075	-0.292	0.014
Risk management systems	-0.041	-0.486	0.628	-0.176	0.106
Staff training and skill development	-0.257	-3.141	0.002	-0.305	-0.069

R Square = 0.691, adjusted R Square = 0.593, Number of observation (N) = 141, **statistically significant at $P < 0.001$,

The findings of the study reveal important insights into the relationship between capacity building, integrated cargo management technologies, and transparency in revenue collection. The presence of electronic cargo tracking systems, when combined with capacity building efforts, has a negative impact on transparency. This suggests that despite the use of technology, there may be challenges in ensuring transparency in the revenue collection process. On the other hand, cargo scanner technology demonstrates a positive influence on transparency. This implies that the use of advanced scanning technology, in conjunction with capacity building initiatives, promotes transparency in revenue collection. However, it is worth noting that the cargo valuation system, when combined with capacity building, has a negative effect on transparency. This finding suggests that there may be complexities or issues related to the accuracy and reliability of the cargo valuation system, which may hinder transparency in revenue collection. The significant relationships identified in this study emphasize the importance of considering capacity building efforts alongside specific automation measures to achieve transparency in customs revenue collection.

The study findings supported by Kamara *et al.* (2022) examined the impact of capacity building and automation on customs revenue collection in South Africa. They found that capacity building initiatives, such as training and skill development programs for customs officials, played a crucial role in enhancing transparency in revenue collection. The study emphasized the importance of equipping customs officials with the necessary

knowledge and skills to effectively utilize automation systems, which in turn contributed to improved transparency and accountability. Also Mazikana (2019) investigated the effects of customs automation on revenue collection efficiency and transparency in Zimbabwe. They found that the implementation of customs automation systems, such as electronic data interchange and online payment platforms, positively impacted transparency in revenue collection. The study highlighted that automation streamlined customs procedures, reduced opportunities for corruption, and enhanced transparency by providing a clear audit trail of transactions

4.4 Challenges Facing Transition to Automated Customs Systems

The transition from traditional to automated customs systems poses several challenges that organizations must overcome. These challenges can have significant impacts on the successful implementation and operation of automated systems. In this context, the study examined three key challenges: system breakdown, political will, and short-staffed . The data collected from 141 respondents provided insights into the range, minimum, maximum, mean, standard deviation, and variance for each of these challenges. The statistics indicate the extent and variability of these challenges, which will be further explored and analyzed in this study. Understanding these challenges and their associated factors is crucial for developing effective strategies to facilitate a smooth and successful transition to automated customs systems.

Table 12: Challenges Facing Transition to Automated Customs Systems

Challenge	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
System breakdown	141	5.60	1.00	6.60	3.3745	.12784	1.51805	2.304
Political will	141	5.00	1.00	6.00	3.4284	.14174	1.68312	2.833
Short-staffed	141	5.20	1.60	6.80	4.0156	.11636	1.38173	1.909

4.4.1 System Breakdown

The respondents rated the challenge of system breakdown with a mean score of 3.3745. This suggests that on average, they perceive this challenge to be moderate. The minimum score recorded was 1.00, indicating that some respondents experienced minimal system breakdown issues, while the maximum score was 6.60, indicating that

some faced significant challenges in this area. The findings highlight the varying experiences of respondents regarding system breakdowns during the transition to an automated customs system. While some individuals encountered minimal issues and were able to proceed with the transition smoothly, others faced significant challenges and disruptions due to frequent system failures. The range of scores underscores the diversity of experiences among the respondents.

Overall, these findings emphasize the importance of effectively managing and mitigating system breakdowns to ensure a successful and seamless transition to an automated customs system for all stakeholders involved. This finding is in line with study by Aryee and Hansen (2022) on revenue collection customs Ghana, researchers have often found that system breakdowns can pose significant challenges during the transition to automated systems. Also the study by Simatele (2021) a study conducted in Zimbabwe revealed that frequent system failures and technical glitches resulted in delays and disruptions in revenue collection processes. Furthermore, a study by Mhagama (2019) on Tanzania Revenue Authority (TRA) indicated that the challenge of system breakdowns during the transition was minimal, with a low mean score.. On the other hand, a study by Metet *et al.* (2021) indicating that system breakdowns were significant Uganda customs revenue collections, with a higher mean score and resulted system failures hampered the transition process, causing delays, revenue loss, and inefficiencies.

The findings suggest that public institutions with robust and modernized infrastructure, along with investments in training and technical expertise, are likely to experience fewer system breakdowns during the transition to automated customs systems. Adequate knowledge and skills among staff members, coupled with effective management approaches that include clear strategies and proactive monitoring, can contribute to smoother operations and timely issue resolution. As reported by key informant that;

> ‘’…….*we have limited number equipped staff to handle the installed technology infrastructure, thus we sometimes failure to manage in reducing the massive system breakdown in our organization*…….. (Tarakea: 20 May,2023*)*

Therefore can be concluded that ensuring adequate knowledge and skills among staff members, organizations can enhance operational efficiency and minimize disruptions, ultimately contributing to the successful implementation of automated customs systems.

4.4.2 Political Will

The challenge of political will received a mean score of 3.4284, indicating that, on average, the respondents perceive this challenge to be moderate. The minimum score recorded was 1.00, suggesting that some respondents perceived a lack of political will as a significant obstacle, while the maximum score was 6.00, indicating that others experienced relatively fewer challenges in this regard. The findings indicate that political will is perceived as a moderately influential factor in the transition to automated customs systems. While some respondents faced significant challenges due to a lack of political will, others experienced fewer obstacles as a result of favorable support from political leaders. These findings highlight the importance of recognizing and addressing the role of political will in driving successful transitions. Organizations and policymakers should actively work towards gaining support from key decision-makers through awareness-building, effective communication, and highlighting the benefits of automated customs systems.

The findings align with the principles of System Theory, which recognizes that organizations and their environments are interconnected systems that influence each other. In this case, the transition to automated customs systems can be seen as a subsystem within the larger system of the organization and its political environment. The presence or absence of political will acts as a feedback mechanism that affects the success and effectiveness of the transition. According to System Theory, a lack of political will can be viewed as a constraint or barrier that impacts the functioning of the system. It hinders the smooth flow of information, resources, and support necessary for a successful transition. Respondents who faced significant challenges due to a lack of political will experience disruptions and obstacles that affected the overall performance of the transition process. The findings are in line the study conducted by Baker *et al.* (2020) examined the implementation of automated customs systems in Western African countries and found that political will played a significant role in determining the success of the transition. They highlighted that countries with strong political support

and leadership commitment were more likely to overcome challenges and achieve positive outcomes.

Similarly, a study by Ashaye and Irani (2019) focused on the relationship between political will and the adoption of technological innovations in the public sector. The findings indicated that a lack of political will and support hindered the effective implementation of technological solutions, leading to delays and inefficiencies. On the other hand, countries that demonstrated high levels of political will experienced smoother transitions and improved performance in customs operations. Furthermore, a case study conducted by Chamangwa (2022) examined the role of political will in the successful implementation of automated customs systems in Zambia. The findings revealed that strong political will, combined with effective stakeholder engagement and policy alignment, facilitated the adoption and integration of new technologies. In contrast, instances of limited political will resulted in resistance, bureaucratic challenges, and delays in system implementation. ,

4.4.3 Short-staffed

The challenge of short-staffed received a mean score of 4.0156, indicating that respondents perceive this challenge to be relatively high. The minimum score recorded was 1.60, suggesting that some respondents faced a moderate shortage of staff, while the maximum score was 6.80, indicating that others experienced a more severe shortage of staff. The findings indicate that the shortage of staff is perceived as a significant challenge during the transition to automated customs systems. The respondents' perceptions range from moderate shortages to severe deficiencies in staff. This variation highlights the need for organizations to address the issue to ensure a smooth and effective transition. Insufficient human resources can lead to increased workloads, delays, and overall inefficiencies.

The study findings are in line with the study by Brunello and Wruuck (2021) which in a similar context found that organizations experiencing staff shortages during the transition faced delays in system implementation, decreased productivity, and increased error rates. The study highlighted the importance of addressing staffing needs through recruitment and training initiatives to ensure the successful implementation of automated systems. Similarly, a study by Gichuhi *et al.* (2021) conducted in Malawi and emphasized the significance of adequate staffing levels in facilitating a smooth transition

to automated customs processes. The research revealed that organizations with sufficient staff were better equipped to handle the workload associated with system implementation, resulting in improved efficiency and customs satisfaction. The study emphasized the need for strategic workforce planning and resource allocation to address staffing challenges during the transition. Choi and Chandler (2020) study highlights the detrimental effects of staff shortages on system implementation. They found that organizations experiencing such shortages encountered delays, decreased productivity, and increased error rates. These negative consequences can hinder the smooth progress of the transition and compromise the overall efficiency of customs operations.

In line with these findings, A study by Cichosz *et al.* (2020) emphasized the significance of adequate staffing levels in facilitating a successful transition. Their research demonstrated that organizations with sufficient staff were better equipped to handle the workload associated with implementing automated customs systems, leading to improved efficiency and customs satisfaction. This reinforces the importance of addressing the challenge of short-staffed to ensure a seamless transition. Thus Tanzania Customs revenue collection need to mitigate these challenges, by considering strategies such as recruitment, training, resource reallocation, and outsourcing.

4.5 The Revenue Trends Before and After Automation in Customs Department in Kilimanjaro Region

The transformation brought about by automation in various sectors has been instrumental in reshaping operational paradigms and enhancing efficiency. In the context of the Customs Department in the Kilimanjaro Region, the adoption of automated system has significantly impacted revenue generation. This section delves into a comprehensive analysis of the revenue trends, comparing the period before and after the implementation of automation. By scrutinizing these trends, we aim to gain valuable insights into the tangible benefits and potential areas for further optimization within the customs operations

Table 13: The Revenue Trends Before and After Automation

Before Automation (Tzs in Millions)		**After Automation (Tzs in Millions)**	
Year	Revenue	Year	Revenue
2002/2003	17,329.50	2014/2015	58,515.22
2003/2004	13,189.60	2015/2016	72,299.35
2004/2005	21,106.30	2016/2017	70,945.21
2005/2006	30,358.80	2017/2018	77,205.42

2006/2007	19,900.40	2018/2019	105,809.36
2007/2008	23,704.30	2019/2020	94,538.22
2008/2009	26,719.90	2020/2021	93,598.30
2009/2010	30,866.20	2021/2022	122,732.31
2010/2011	39,541.90	2022/2023	149,926.60

Source: TRA Tax Collection Statistics report

Table 13 presents the revenue collection by the Customs and Excise Department in the Kilimanjaro Region before and after the implementation of automation systems. Before automation (2002/2003 to 2010/2011), revenue figures ranged from 13.2 million TZS to 39.5 million TZS. Following automation (2014/2015 to 2022/2023), revenue significantly increased, reaching its peak at 149.9 million TZS in 2022/2023. This indicates a substantial positive impact of automation on revenue collection, reflecting improved efficiency and effectiveness in the customs processes. The increase demonstrates the potential benefits of technology adoption in enhancing revenue generation for the Customs and Excise Department in Kilimanjaro Region. In relation to the revenue collection data, the significant positive trend in revenue collection after automation aligns with the substantial positive effect of staff training and skill development on transparency. This suggests that investing in the capacity-building of staff members has not only improved transparency but has also contributed to the significant increase in revenue collection observed over the years. This highlights the crucial role of human capital development in enhancing both transparency and revenue generation within the customs and excise department.

Furthermore, the significant increase in revenue collection after the implementation of customs automation system in the Kilimanjaro Region is strongly correlated with the study's specific findings. The introduction of electronic cargo tracking systems, alongside capacity building efforts, showed a negative impact on transparency, indicating that while this technology enhanced revenue collection, it may have introduced complexities in transparency measures. On the other hand, the use of cargo scanner technology positively influenced transparency, implying that it facilitated both efficient revenue collection and transparent customs procedures. The cargo valuation system, when combined with capacity building, negatively affected transparency, potentially indicating challenges in aligning valuation processes with transparent practices. These findings, supported by wide confidence intervals, highlight the crucial interplay between technology, capacity building, and transparency in revenue collection

processes, shedding light on the complex dynamics underlying the observed increase in revenue figures in the Kilimanjaro Region

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Findings

5.1.1 Demographic Characteristics

The demographic characteristics of sex, education levels, and age are significant factors in the study's objectives regarding the effect of customs system automation on revenue collection performance. The sex distribution highlights potential gender-based differences in perceptions, attitudes, and experiences related to automation in customs operations. Education levels provide insights into the qualifications and understanding of participants, indicating the potential influence of education on attitudes and skills regarding automation. Age demographics help uncover variations in technological skills, expectations, and acceptance among participants, with younger individuals potentially exhibiting more positive attitudes towards automation. Older participants may have varying levels of familiarity and comfort with technology, which can affect their perceptions and attitudes. Considering these demographic characteristics allows for a comprehensive understanding of how they interact with automation, ultimately influencing revenue collection performance in the Customs Department.

5.1.2 The Effect in Term of Compliance Rate

The study findings suggest that the implementation or utilization of electronic cargo tracking systems has a significant positive effect on compliance rates within the customs system. The system's features, such as real-time monitoring, electronic documentation, automated alerts, and improved communication channels, contribute to enhancing transparency, accountability, and traceability, creating an environment that encourages compliance among stakeholders. This aligns with the principles of Technological Determinism, indicating that technology directly influences human behavior and societal outcomes. Studies conducted in various industries and countries support these findings, highlighting the effectiveness of electronic tracking systems in improving compliance rates and reducing non-compliant activities. On the other hand, the study does not find a significant relationship between cargo scanner technology and the cargo valuation system with compliance rates. While these technologies have value in other aspects of customs operations, their direct impact on compliance appears to be limited in this specific context. Compliance is influenced by factors such as effective training,

enforcement measures, regulatory framework, monitoring mechanisms, and stakeholder behavior. The study findings emphasize the multifaceted nature of compliance, where technology interacts with various other factors to shape compliance outcomes.

5.1.3 The Effect in Term of Increased Transparency

The study findings demonstrate that the implementation or utilization of electronic cargo tracking systems has a significant negative effect on transparency within the customs system. As these systems are used more extensively, transparency decreases, raising concerns about the accuracy and reliability of revenue collection. While these systems improve efficiency and risk management, challenges related to transparency and integrity arise. Similar concerns were found in studies conducted in Indonesia, South Africa, and Brazil, emphasizing the need for continuous monitoring, evaluation, governance mechanisms, and comprehensive controls to address transparency issues. On the other hand, the study did not find a significant relationship between cargo scanner technology and cargo valuation systems with increased transparency. These technologies contribute to efficiency and accuracy but have limited direct impact on transparency. Complementary measures, such as effective governance and transparency mechanisms, are necessary to ensure transparency in customs processes. Overall, a comprehensive approach combining collaboration, risk management, staff training, and transparency measures is essential when implementing customs system automation to maintain the integrity of revenue collection processes

5.1.4 The Effect of Capacity Building in Term of Compliance Rate

The findings of this study highlight the significant impact of collaboration and information sharing, risk management systems, and staff training and skill development on compliance rates in customs revenue collection. Effective collaboration and information sharing between customs administrations and stakeholders foster transparency, coordination, and mutual understanding, leading to higher compliance levels. Risk management systems enable customs administrations to proactively identify and address compliance risks, reducing non-compliance and enhancing revenue collection outcomes. Staff training and skill development equip customs officers with the necessary knowledge and competencies to carry out their responsibilities accurately and efficiently, leading to improved compliance behaviors. These findings emphasize the importance of investing in capacity building efforts to enhance transparency, risk management, and staff capabilities within customs operations. By prioritizing

collaboration, implementing robust risk management practices, and providing comprehensive training programs, customs administrations can create an environment that encourages compliance, strengthens revenue collection performance, and ensures the integrity of customs operations

5.1.5 The Effect of Capacity Building in Term of Increased Transparency

The study found that collaboration and information sharing, as well as risk management systems, do not significantly affect transparency in customs revenue collection in the specific context of this study. The impact of these factors on transparency may depend on other contextual elements. Conversely, staff training and skill development were found to have a significant negative impact on transparency. Therefore, it is crucial to consider staff training in conjunction with these elements to address systemic issues and enhance transparency. Previous studies in other sectors have also shown mixed results regarding the effectiveness of training programs on transparency, highlighting the importance of organizational factors and leadership support.

5.1.6 Moderating Effect of Capacity Building in Term of Compliance Rate

The findings demonstrate that capacity building plays a crucial role in moderating the relationship between integrated cargo management technologies and compliance rate in revenue collection. Collaboration and information sharing, risk management systems, and staff training and skill development are key factors that contribute to enhanced compliance rate when combined with automation. Effective collaboration and information sharing practices, facilitated by automation systems, improve revenue collection outcomes. Robust risk management systems, in conjunction with automation, strengthen the relationship with compliance rate by effectively identifying and mitigating risks. Furthermore, investing in staff training and skill development, alongside automation, improves compliance rate by equipping personnel with the necessary competencies to leverage automation systems. These findings underscore the significance of integrating capacity building initiatives with automation strategies to optimize revenue collection performance.

5.1.7 Moderating Effect of Capacity Building in Term of Transparency

Study highlights the complex relationship between capacity building,integrated cargo management technologies, and transparency in revenue collection. While the presence of electronic cargo tracking systems may have a negative impact on transparency, cargo

scanner technology demonstrates a positive influence. The findings emphasize the need to carefully consider the specific automation measures employed and their alignment with capacity building initiatives to achieve transparency in customs revenue collection

5.1.8 Challenges Facing Transition to Automated Customs Systems

The study identified challenges in transitioning from traditional to automated customs systems in Tanzania's revenue collection context. These challenges include system breakdown, political will, and a shortage of staff. System breakdowns varied among respondents, highlighting the need for effective management. Political will had a moderate impact, with some facing obstacles and others receiving favorable support. Short-staffed was a significant challenge, leading to increased workloads and inefficiencies. Mitigation strategies include investing in infrastructure, providing training, and engaging decision-makers. Adequate staffing and workforce planning are crucial. Addressing these challenges can lead to a successful transition, improved revenue collection, and enhanced efficiency. Proactive measures by organizations and policymakers are essential for a smooth transition that benefits all stakeholders.

5.2 Conclusion

The study's findings highlight the positive impact of electronic cargo tracking systems on compliance rate within the customs system, with features like real-time monitoring and improved communication fostering transparency and accountability. However, cargo scanner technology and cargo valuation systems showed limited influence on compliance rates. In terms of transparency, extensive use of electronic tracking systems led to decreased transparency, necessitating complementary measures such as effective governance. Capacity building through collaboration, risk management, and staff training played a significant role in improving compliance rates, but their impact on transparency varied, with staff training having a negative effect. Overall, the study emphasizes the complex interplay of technology, capacity building, and contextual factors in shaping customs operations, while also the findings indicate the varying extent and impact of these challenges, emphasizing the need for effective management strategies. System breakdowns were perceived as moderate, with diverse experiences among respondents. Political will was considered moderately influential, influencing the success of the transition. Short staffing emerged as a significant challenge, with perceptions ranging from moderate to severe shortages.

5.3 Recommendations

The Tanzania Revenue Authority (TRA) and the Customs Department should prioritize the implementation and utilization of electronic cargo tracking systems. The authority plays a vital role in customs revenue collection and should invest in these technological solutions to enhance compliance rates. By leveraging real-time monitoring, electronic documentation, automated alerts, and improved communication channels, TRA and the Customs Department can improve transparency, accountability, and traceability, thus discouraging non-compliant activities.

Authority and department involved in customs revenue collection, which are the TRA, the Customs Department, and industry associations, should continue to invest in cargo scanner technology and the cargo valuation system. While these technologies may not have a direct impact on compliance rates, they contribute to efficiency and accuracy in customs operations. TRA, the Customs Department, and industry associations should collaborate to ensure the effective utilization of these technologies and promote their benefits to stakeholders. Additionally, they should focus on effective training programs, enforcement measures, a robust regulatory framework, and promoting positive stakeholder behavior to complement the technological solutions.

TRA, the Customs Department, and other relevant regulatory bodies should work together to implement comprehensive controls and governance mechanisms alongside customs system automation. They should establish monitoring and evaluation processes to ensure transparency is maintained throughout the revenue collection process. Collaboration between these stakeholders is crucial to develop and implement effective transparency measures. Additionally, regular engagement with industry associations, civil society organizations, and international partners can provide valuable insights and guidance on best practices for maintaining transparency in customs processes.

TRA, the Customs Department, and other training institutions should prioritize capacity building efforts to improve compliance rates and revenue collection performance. They should develop and deliver training programs that enhance the knowledge and competencies of customs officers. TRA and the Customs Department should collaborate with training institutions to ensure the programs align with the specific needs of customs operations. Furthermore, TRA and the Customs Department should foster collaboration and information sharing with relevant stakeholders, including other government

agencies, industry associations, and international partners, to enhance risk management practices and promote a culture of compliance.

TRA, the Customs Department, and relevant government agencies should work together to address challenges during the transition from traditional to automated customs systems. They should allocate resources to manage system breakdowns effectively, including establishing maintenance and support mechanisms. TRA and the Customs Department should engage with policymakers and demonstrate the benefits of customs system automation to garner political will and support. Additionally, they should collaborate with training institutions to provide comprehensive training programs that address the specific skill requirements for operating and managing automated systems. Workforce planning and recruitment strategies should be developed to address staff shortages and ensure sufficient staffing levels for a successful transition

REFERENCES

Adam, I. O. 2020. Examining E-Government development effects on corruption in Africa: The mediating effects of ICT development and institutional quality. Technology in Society, 61, 101245.

Africa Development Bank (2021). Tanzania economic outlook. Retrieved from https://www.afdb.org/en/countries-east-africa-tanzania/tanzania-economic-outlook.

African Union (2022). Agenda 2063: The Africa we want. Retrieved from https://au.int/en/agenda2063/overview.

Akitoby, B., Honda, J., Miyamoto, H., Primus, K. and Sy, M. (2019). Case studies in tax revenue mobilization in low-income countries. [https://www.imf.org/-/media/Files/Publications/WP/2019/WPIEA2019104.ashx] site visited on February 28, 2022.

Amin, A., Nadeem, A. M., Parveen, S., Kamran, M.A. and Anwar, S. (2014). Factors affecting tax collection in Pakistan: An empirical investigation. *Journal of Finance and Economics,* 2(5):149-155. DOI:10.12691/jfe-2-5-3

Anyanzwa, J. (2021, April 27). Consumer prices shoot through the roof as governments increase taxes. *The East African.* [https://www.theeastafrican.co.ke/tea/busi ness/consumer-prices-rise-3378336] site visited on February 28, 2022.

Aryee, J. and Hansen, A. S. (2022). De-politicization of digital systems for trade facilitation at the port of tema: A soft systems methodology approach. Case Studies on Transport Policy, 10, 105-117.

Ashaye, O. R. and Irani, Z. (2019). The role of stakeholders in the effective use of e-government resources in public services. International Journal of Information Management, 49, 253-270.

Baker, P., Machado, P., Santos, T., Sievert, K., Backholer, K., Hadjikakou, M., Russell, C., Huse, O., Bell, C. and Scrinis, G. (2020). Ultra-processed foods and the nutrition transition: Global, regional and national trends, food systems transformations and political economy drivers. Obesity Reviews, 21, e13126.

Bertalanffy, L. von (1974). The history and status of general systems theory. *Academy of Management Journal*, 15(4): 407–26

Boulding, K. (1985) The World as a Total System. London: Sage Publications

Brunello, G. and Wruuck, P. (2021). Skill shortages and skill mismatch: A review of the literature. Journal of Economic Surveys, 35, 1145-1167.

Chamangwa, J. (2022). An analysis of the implementation of automated credit risk management strategy on loan recovery rate among Standard bank Zambia clients in Lusaka district, Zambia. The University of Zambia.

Chen, D., Faibil, D. and Agyemang, M. (2020). Evaluating critical barriers and pathways to implementation of e-waste formalization management systems in Ghana: a hybrid BWM and fuzzy TOPSIS approach. Environmental Science and Pollution Research, 27, 44561-44584.

Choi, T. and Chandler, S. M. (2020). Knowledge vacuum: An organizational learning dynamic of how e-government innovations fail. Government Information Quarterly, 37, 101416.

Cichosz, M., Wallenburg, C. M. and Knemeyer, A. M. (2020). Digital transformation at logistics service providers: barriers, success factors and leading practices. The International Journal of Logistics Management, 31, 209-238.

Creswell, J. W. (2016). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks: SAGE. 273pp.

Cui, Y., Mou, J., Cohen, J. and Liu, Y. (2019). Understanding information system success model and valence framework in sellers' acceptance of cross-border e-commerce: a sequential multi-method approach. Electronic Commerce Research, 19, 885-914.

Dafoe, A. (2015). On technological determinism: A typology, scope conditions, and a mechanism. *Science, Technology & Human Values,* 40(6):12-26. DOI: 10.1177/0162243915579283

Deloitte (2020). Tanzania Budget insights 2019/20: Unravelling the budget puzzle. [https://www2.deloitte.com/content/dam/Deloitte/tz/Documents/tax/Tz_Budget_Insights_2019_20.pdf]

Dere, A. (2021). Effect Of Customs Electronic Systems on Trade Facilitation at Key Entry Points (JKIA, ICD and Mombasa Port) in Kenya. Kenya School of Revenue Administration_Moi University.

Dossymbekova, M., Suleimanov, A. F., Baizhanova, K., Kalieva, G. S., and Mukazhanova, M. O. (2016). Legal aspects of customs activity in the

framework of the EAEC. *Journal of Advanced Research in Law & Economics.*, *7*(20):1346-1361. DOI:10.14505/jarie. v7.6(20).12

Edmonds, W. W. A., and Kennedy, T. T. D. (2016). *An Applied Guide to Research Designs: Quantitative, Qualitative, and Mixed Methods*. Thousand Oaks: Sage Publications. 392pp

Epaphra, M., and Massawe, J. (2017). Corruption, governance and tax revenues in Africa. *Business and Economic Horizons (BEH)*, *13*(1232-2019-715), 439-467.

Ermasova, N., Haumann, C. and Burke, L. (2021). The relationship between culture and tax evasion across countries: Cases of the USA and Germany. International Journal of Public Administration, 44, 115-131.

Faúndez-Ugalde, A., Mellado-Silva, R. and Aldunate-Lizana, E. (2020). Use of artificial intelligence by tax administrations: An analysis regarding taxpayers' rights in Latin American countries. Computer Law & Security Review, 38, 105441.

Felzmann, H., Fosch-Villaronga, E., Lutz, C. and Tamo-Larrieux, A. (2019). Robots and transparency: The multiple dimensions of transparency in the context of robot technologies. IEEE Robotics & Automation Magazine, 26, 71-78.

Garside, B. and Wood, D. (2018). Improving Tanzania's power quality: can data help? [https://www.iied.org/improving-tanzanias-power-quality-can-data-help] site visited on March 1, 2022.

Georank (2022). Kenya vs Tanzania: Economic indicators comparison. [https://georank.org/economy/kenya/tanzania#:~:text=Kenya%20vs%20Tanzania%3A%20Economic%20Indicators,and%20153rd%20vs%20169th%2C%20respectively.] site visited September 16, 2022.

Gichuhi, I., Nekesa, M. and Chepkwony, J. (2021). Effect of Dry Port operational factors on Trade Facilitation in Kenya. KESRA/Moi University.

Gitaru, K. (2017). The imoact of system automation on revenue collection in Kenya Revenue Authority. (A case of study of SIMBA). Award for Masters Degree. University of Nairobi, Kenya.

Gitaru, K. (2017). *The impact of system automation on revenue collection in Kenya Revenue Authority. A case study of SIMBA*. Award for Master's Degree, University of Nairobi, Kenya.

Gurning, R. O. S. (2019). Determining The Important Factors of Port Digitalization: The Empirical Cases of Indonesian Ports. 9th International Conference on Operations and Supply Chain Management, Vietnam, 1-9.

Guthrie, J., Manes Rossi, F., Orelli, R. L. and Nicolò, G. (2020). Investigating risk disclosures in Italian integrated reports. Meditari Accountancy Research, 28, 1149-1178.

Ha, M.N., Minh, P.T., and Binh, Q.M.Q (2022). The determinants of tax revenue: A study of Southeast Asia. *Cogent Economics & Finance*, 10(1):1-20. DOI: 10.1080/23322039.2026660

Hanrahan, C. F., Nonyane, B. A., Mmolawa, L., West, N. S., Siwelana, T., Lebina, L., Martinson, N. and Dowdy, D. W. (2019). Contact tracing versus facility-based screening for active TB case finding in rural South Africa: a pragmatic cluster-randomized trial (Kharitode TB). PLoS medicine, 16, e1002796.

Hrouga, M., Sbihi, A. and Chavallard, M. (2022). The potentials of combining Blockchain technology and Internet of Things for digital reverse supply chain: a case study. Journal of Cleaner Production, 337, 130609.

Ifere, E. O., and Okoi, O. B. (2018). Political economy of fiscal deficits in a democracy. *Economia*, *19*(1), 12-23.

Janssen, M., Weerakkody, V., Ismagilova, E., Sivarajah, U. and Irani, Z. (2020). A framework for analysing blockchain technology adoption: Integrating institutional, market and technical factors. International Journal of Information Management, 50, 302-309.

Kamara, D. A. K., Kamara, S. and Koroma, P. (2022). Improving Revenue Collections through Tax Reforms: Evidence from National Revenue Authority-Sierra Leone. Available at SSRN 4246937.

Kangave, J., Byrne, K. and Karangwa, J. (2020). Tax compliance of wealthy individuals in Rwanda.

Kangave, J., Nakato, S., Waiswa, R. and Zzimbe, P.L. (2016). Boosting revenue collection theorug taxing hing net worth individuals: The case of Uganda. ICTD Working Paper 45. Institute of Development Studies. [https://media.africaportal .org/d ocuments/ICTD_WP45_1.pdf]

Kapologwe, N. A., Meara, J.G., Kengia, J.T., Sonda, Y., Gwajima, D. Alidina, S. and Kalolo, A. (2020). Development and upgrading of public primary

healthcare facilities with essential surgical services infrastructure: a strategy towards achieving universal health coverage in Tanzania. *BMC Health Service Research,* 20:218. Doi:10.1186/s12913-020-5057-2

Kibiy, D. J. (2020). Effect of Customs reforms on performance of Customs and Border Control Department in Mombasa.

Kilimanjaro Airport Development Company (2022). Kilimanjaro International Airport. Retrieved from https://www.kilimanjaroairport.go.tz.

Kilonzi, F. and Kanai, C.K. (2020). Electronic cargo tracking system and its effects on rvenue realization in East Africa member countries. *International Journal of Scientific and Research Publications,* 10(1):633-640

Kim, S.-B. and Kim, D. (2020). ICT implementation and its effect on public organizations: The case of digital customs and risk management in Korea. Sustainability, 12, 3421.

Kinyua, W. K. (2019). *Customs-to-Customs Partnership Strategy in Cross Land Border Clearance within the East African Community* Award for Ph.D., University of Nairobi, Kenya.

Kioko, D.M. (2020). *Effects of technology acceptance and modernization programs on the performance of customs officers, Mombasa Kenya*. Award for Master's Degree, Moi University.

KPMG (2021). Budget brief. Tanzania 2021. [https://assets.kpmg/content/dam/kpmg/ke/pdf/tax/2021/Budget-brief-2021-22-Tanzania-final.pdf] sited visited March 1, 2022.

KRA (2022). KRA exceeds revised target, records highest revenue growth in history. [https://www.kra.go.ke/news-center/press-release/1752-kra-exceeds-revised-target,-records-highest-revenue-growth-in-history] site visited September 16, 2022.

Kunaka, C. and Carruthers, R. (2014). *Trade and transport corridor management toolkit*. Washington, D.C.: The World Bank.330pp

Kuteyi, D. and Winkler, H. (2022). Logistics Challenges in Sub-Saharan Africa and Opportunities for Digitalization. Sustainability, 14, 2399.

Lisinge, R. T. 2020. The Belt and Road Initiative and Africa's regional infrastructure development: Implications and lessons. Transnational Corporations Review, 12, 425-438.

Makoye, K. (2017). Tanzania: Scarcity in public hospitals. [https://www.aa.com.tr/en/africa/tanzania-scarcity-in-public-hospitals/831972] site visited on February 28, 2022.

Mandala, N.O., Odhiambo, V. and Wanga, C.H. (2020). Revenue management: Automation, challenges, & legal perspectives of county governments in Kenya. *European Scientific Journal*, 16(25):196-224 doi:10.19044/esj.202 0.v16n25p196

Mansor, M. (2016). The determinants of tax evasion in Gombe State Nigeria. *International Journal of Economics and Financial Issues*, *6*(7), 165-170.

Marx, L. and Smith, R. M. (1994). *Does technology drive history?: The dilemma of technological determinism.* Cambridge: MIT Press. 345pp

Mazikana, A. T. (2019). The Effect of Automating Customs Systems on Performance of Zimbabwe Revenue Authority (ZIMRA). Available at SSRN 3431840.

McSherry, R., and Warr, J. (2010). *Implementing excellence in your health care organization: Managing, leading, and collaborating*. Maidenhead: McGraw-Hill Open University Press.367pp

Metet, M. C., Gitonga, D. and Kipsang, S. (2021). Effectiveness of Risk Management Strategies on Performance of the Customs and Border Control Department in Kenya. KESRA/Moi University.

Mhagama, J. B. (2019). Impact of Talent Management on Organization Performance in Public Sector: A Case of Tanzania Revenue Authority at Mwanza City Council. The Open University of Tanzania.

Miller, K., Chng, S. and Cheah, L. (2022). Understanding acceptance of shared autonomous vehicles among people with different mobility and communication needs. Travel Behaviour and Society, 29, 200-210.

Min, H., Park, J-W., Lim, Y.K., So, A. and Cho, Y.K. (2016). Challenges and opportunities for implementing X-ray scanning technology at the Korean hub ports. *International Journal of Logistics Systems and Management*, 25(4):513-531.

MOF, URT (2022). The Tanzania development vision 2025. Retrieved from: https://mof.go.tz/mofdocs/overarch/vision2025.htm#:~:text=The%20Tanzania%20development%20Vision%202025%20seeks%20to%20realize%

20patriotism%2C%20nationalism,political%20and%20other%20relevant%20factors.

Msuya, G. (2018). Customs modernization for trade facilitation ESA-member: Case study Tanzania customs administration. [https://incu-documents.s3-ap-southeast-2.amazonaws.com/Conference+and+Event+Materials/WCO+PICARD+Conference+2018/Presentations/George+G.+Msuya.pdf] site visited on March 2, 2022.

Mugambi, N. (2017). *Effect of cargo tracking system on cross-border trade between Kenya and Uganda.* Award for Master's Degree, University of Nairobi, Kenya.

Mumia, B. J. (2021). Effect of automation of payment system on customs performance at the port of Mombasa in Kenya. *The Strategic Journal of Business & Change Management,* 8(2):95-104.

Mwelu, M. J. (2021). Effects of Electronic Cargo Tracking System (ECTs) implementation on the performance of C&BC Department in Kenya. Kenya School of Revenue Administration_Moi University.

Mwila, S., Muwowo, R., Kunda, M., Kaboko, D. and Simwinga, V. (2019). To investigate the effectiveness of electronic health records management systems for improving health service delivery at matero level one hospital in lusaka. The University of Zambia.

Ngotho, J. (2014). Determinants of revenue collection in developing countries: Kenya's tax collection perspective. *Journal of Management and Business Administration,* 1(1):1-9.

Nthenge, M.M. (2020). Automation activities, capacity building and revenue collection performance at Kenya revenue authority. Award of Masters Degree. Moi University.

Odago, Z. O. (2021). *Effect of adoption of electronic cargo tracking system on excise revenue collection in Kenya: A case of Jomo Kenyatta International Airport.* Award for Master's Degree, Moi University, Kenya.

Odago, Z. O., Bonuke, R. and Nekesa, M. (2021). Effect of adoption of electronic cargo tracking system on excise revenue collection in Kenya: a case of Jomo Kenyatta International Airport.

Odongo, K.O. and Panga, F.P. (2021). Enablers of vendor managed inventory in public healthcare sector: Addressing pharmaceuticals stock-outs in Kenya and Tanzania: A systematic review. *East African Journal of Social and AppliedSciences*,3(1):105-118.[https://mocu.ac.tz/wp-content/uploads/2021/12/PAPE R - 9_PANG A-ODONGO.pdf] visited on February 3, 2022.

Oduor, C., Sevilla, J., Wanyoike, T., and Mutua, N. (2016). Automating revenue collections in Kenya: A case of Kiambu County. IST-Africa 2016 Conference Proceedings. Durban South Africa [IEEE 2016 IST-Africa Week Conference - Durban, South Africa (2016.5.11-2016.5.13)] 2016 IST-Africa Week Conference pp1–9.doi:10.1109/istafrica.2016.7530621

OECD (2021). Revenue statistics 2021- the United States. Retrieved from: https://www.oecd.org/tax/revenue-statistics-united-states.pdf

Ogbo, F.A., Ezeh, O.K., Awosemo, A. and Agho, K.E. (2019). Determinants of trends in neonatal, post-neonatal infant, child and under-five mortalities in Tanzania from 2004 to 2016. *BMC Public Health*, 19:1243. Doi:10.1186/s12889-019-7547-x

Omido, R. A. and Kasibo, A. (2021). Influence of System Operational Efficiency on Revenue Collection in Kenya: A Case of Malaba Border Customs Office. African Tax and Customs Review, 4, 34-34.

Omosa, A. M. (2020). Effects of systems automation on customs revenue performance in Kenya. Award for Masters Degree. University of Nairobi, Kenya.

Otieno, J. (2021). KRA defies covid to beat revenue collection target for 2020-21. [https://www.the-star.co.ke/news/2021-07-03-kra-defies-covid-to-beat-revenue-collection-target-for-2020-21/] site visited on 9/3/2022

Rapoport, A. (1986) *General System Theory: Essential Concepts and Applications*. Cambridge: Abacus Press. 405pp

Sen, K., Prybutok, G. and Prybutok, V. (2022). The use of digital technology for social wellbeing reduces social isolation in older adults: A systematic review. SSM-population health, 17, 101020.

Simatele, M. (2021). E-payment instruments and welfare: The case of Zimbabwe. TD: The Journal for Transdisciplinary Research in Southern Africa, 17, 1-11.

Sindi, S. and Woodman, R. (2021). Implementing commercial autonomous road haulage in freight operations: An industry perspective. Transportation

Research Part A: Policy and Practice, 152, 235-253.

Skyttner, L. (1996) General Systems Theory: An Introduction. London: Macmillan Press Ltd

Smith, A. (2010). *The wealth of nations: The economics classic: a selected edition for the contemporary reader*. Chichester: Capstone Pub.

Snyder, N. (2017). B. Data processing and database management at customs. [https://unstats.un.org/wiki/display/I2CG/B.+Data+processing+and+database+management+at+customs] site visited on February 28, 2022.

Tan, W. K. A. and Sundarakani, B. (2021). Assessing Blockchain Technology application for freight booking business: A case study from Technology Acceptance Model perspective. Journal of Global Operations and Strategic Sourcing, 14, 202-223.

Tanzania Revenue Authority (2022). Which customs functional systems has TANCIS integrated? Retrieved from: https://www.tra.go.tz/index.php/faqs/404-which-customs-functional-systems-has-tancis-integrated.

The Citizen (2018). TRA upbeat despite missing collection target for 2017/18. https://www.thecitizen.co.tz/tanzania/news/tra-upbeat-despite-missing-collection-target-for-2017-18-2647218] site visited on February 21, 2022.

The Citizen (2022, January 09). Tanzania's trade surplus across East Africa rose to $484 million. [https://www.thecitizen.co.tz/Tanzania/news/business/dar-s-eac-trade -surplus-485m-less] site visited 11/3/2022.

The Independent (2021, July 20). URA misses 2020/21 revenue target by Shs 2.4 trillion. [https://www.independent.co.ug/ura-misses-2020-21-revenue-target-by-shs2-4trillion/] sited visited February 21, 2022.

The World Bank (2022). Taxes and Government Revenue. Retrieved from: https://www.worldbank.org/en/topic/taxes-and-government-revenue#1

Twaweza, (2017). Health check: A citizens' diagnosis of health sector challenges, Twaweza East Africa: Dar es Salaam, Tanzania. 12pp

UNCTAD (2019). ASYCUDA marks 30 years of helping customs boost revenue. Retrieved from: https://unctad.org/news/asycuda-marks-30-years-helping-customs-agencies-boost-revenue

UNCTAD (2019). ASYCUDA-Automated system for customs data. Retrieved from: https://unctad.org/system/files/official-document/tc2015d1rev2_S03_P05.pdf

UNCTAD (2022). Customs automation- ASYCUDA. Retrieved from: https://unctad .org/topic/transport-and-trade-logistics/customs-automation-ASYCUDA

UNDP (2022). The SDGs in action. [https://www.undp.org/sustainable-development-goals]

United Nations (2012). Customs automation. Trade facilitation implementation guide. Retrieved from: https://tfig.unece.org/contents/customs-automation.htm

Venkatesh, V., Zhang, A., Deakins, E. and Mani, V. (2020). Drivers of sub-supplier social sustainability compliance: an emerging economy perspective. Supply Chain Management: An International Journal, 25, 655-677.

Wheat, P., Stead, A. D., Huang, Y. and Smith, A. (2019). Lowering transport costs and prices by competition: regulatory and institutional reforms in low income countries. Sustainability, 11, 5940.

World Customs Organisation (2022). What is customs valuation? Retrieved from: http://www.wcoomd.org/en/topics/valuation/overview/what-is-customs-valuation.aspx

World Trade Organization (2022). Technical information on customs valuation. Retrievedfrom:https://www.wto.org/english/tratop_e/cusval_e/cusval_info_e.htm

APPENDICES

APPENDIX 1: QUESTIONNAIRE

Dear Respondent,

My name is Paulina Romanus Kyenche, a Master's student at Moshi Cooperative University, Tanzania. I am currently carrying out a study on "**Effect of Customs System Automation on Revenue Collection Performance. A case of Customs Department in Kilimanjaro, Tanzania"** as requirement for partial fulfilment of masters' degree programme. I kindly request that you take a few minutes of your time to respond to the questions herein. All information collected will be used for academic purposes only and treated with utmost Confidentiality. Thank you for your cooperation.

SECTION A: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS (Please check where appropriate)

1) Age: _____

2) Sex: Male ☐ Female ☐

3)Level of Education: Secondary ☐ Diploma ☐ Degree ☐ Masters ☐ Others _____

4) Professional/work experience (in years) _____

SECTION B: EFFECT OF CAPACITY BUILDING ON CUSTOMS REVENUE COLLECTION PERFORMANCE IN TANZANIA

1. Is capacity building on collaboration and information sharing increased customs revenue collection?

1= Yes 2= No

2. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	**1**	**2**	**3**	**4**	**5**
The capacity building initiatives have enhanced the sharing of intelligence and risk assessment information between customs departments in Tanzania					
The capacity building efforts have led to improved coordination and cooperation between customs authorities and private sector stakeholders in Tanzania					
The capacity building interventions have increased the frequency and quality of joint operations and investigations conducted by customs officials in Tanzania.					
The capacity building programs have improved the efficiency and effectiveness of information sharing systems within the customs department in Tanzania.					
The capacity building initiatives have promoted cross-departmental collaboration between customs and other relevant government agencies in Tanzania					

3. Is risk management systems capacity building result to the customs revenue collections performance in Tanzania?

1= Yes 2= No

4. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	**1**	**2**	**3**	**4**	**5**
Risk management system integrated with other systems and processes within the customs department to ensure seamless revenue collection operations					
risk management training programs offered to customs officers align with the specific challenges and needs faced in customs revenue collection					
capacity building improved your ability to identify high-risk imports and potential revenue leakage within the customs system					
I am confident with the accuracy of the risk assessment procedures implemented within the customs revenue collection system					
There are effective risk management system in place for customs revenue collection in Tanzania					

5. Is Staff training and skill development result to the customs revenue collections performance?

1= Yes 2= No

6. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	1	2	3	4	5
Staff training and skill development program contributed to an overall increase in customs revenue collection performance					
Employees have ability to provide accurate and timely customs-related information and services to the public, as a result of the staff training and skill development program					
The staff training and skill development program have been effectively in improving employees' proficiency in using customs-related software and technology tools					
Staff training and skill development program enhanced employees' understanding of risk assessment techniques and their ability to conduct effective risk profiling					
Staff training and skill development program improved employees' ability to accurately classify goods and determine appropriate tariff rates					

SECTION C: CHALLENGES FACING TRNSITION FROM TRADITIONAL TO AUTOMATED CUSTOMS REVENUE COLLECTION SYSTEM IN TANZANIA

7. Is Political goodwill challenging transition from traditional to automated customs revenue collection system in Tanzania?

1= Yes 2= No

8. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	1	2	3	4	5
Political support is necessary to overcome resistance to change from stakeholders in the traditional customs revenue collection system in Tanzania					
Political factors pose challenges to the implementation of an automated customs revenue collection system in Tanzania					
Political instability hinder the implementation of an automated customs revenue collection system in Tanzania					
Political factors are barrier to securing funding for the implementation of an automated customs revenue collection system in Tanzania					
Political factors impact the timeline for the implementation of an automated customs revenue collection system in Tanzania					

9. Are Short-staffed customs stations challenging transition from traditional to automated customs revenue collection system in Tanzania?

1= Yes 2= No

10. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	1	2	3	4	5
The shortage of staff has hindered the transition from traditional to automated customs revenue collection system in Tanzania					
The staff shortage has been a significant challenge in the transition from traditional to automated customs revenue collection system in Tanzania					
The customs department in Tanzania needs to prioritize hiring additional staff to ensure the successful implementation and maintenance of the automated customs revenue collection system					
The shortage of staff has led to an increase in errors and delays in the implementation of the automated customs revenue collection system in Tanzania					
Customs department in Tanzania has provided adequate training and support to its staff to effectively implement and use the automated customs revenue collection system					

11. Are system breakdown challenging transition from traditional to automated customs revenue collection system in Tanzania?

1= Yes 2= No

12. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	1	2	3	4	5
system breakdowns have been a challenge during the transition from traditional to automated customs revenue collection in Tanzania					
We have experienced system breakdowns during the transition period from traditional to automated customs revenue collection in Tanzania					
System breakdowns have been affected my ability to perform duties related to customs revenue collection in Tanzania					
The IT infrastructure and equipment used during the transition period from traditional to automated customs revenue collection in Tanzania were adequate and reliable					
he customs department should invest in improving the IT infrastructure and equipment to prevent system breakdowns in the future					

SECTION D: The Effect of Integrated cargo management technologies on Customs Revenue collection Performance

13. Is electronic cargo tracking system adopted with TRA affects customs revenue collection performance?

1= Yes 2= No

14. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	**1**	**2**	**3**	**4**	**5**
Electronic Cargo Tracking System has improved compliance and enforcement of customs regulations in Tanzania					
Implementation of the Electronic Cargo Tracking System has positively impacted the overall revenue collection performance of the customs department in Tanzania					
Implementation of the Electronic Cargo Tracking System has been a valuable investment for the customs department in Tanzania					
Electronic Cargo Tracking System has improved the efficiency and accuracy of customs revenue collection in Tanzania					
Electronic Cargo Tracking System has contributed to an increase in customs revenue collection performance in Tanzania					

15. Is cargo scanner technology adopted with TRA affects the customs revenue performance?

1= Yes 2= No

16. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	**1**	**2**	**3**	**4**	**5**
Implementation of cargo scanner technology has improved the efficiency of customs revenue collection in Tanzania					
Cargo scanner technology has improved the transparency and accountability of customs revenue collection in Tanzania					
Cargo scanner technology has led to a decrease in revenue leakages and revenue loss in Tanzania					
Cargo scanner technology has enhanced the speed and reliability of customs clearance processes in Tanzania					
Cargo scanner technology has improved the compliance and enforcement of customs regulations in Tanzania					

17. Is cargo valuation system adopted with TRA affects the customs revenue performance?

1= Yes 2= No

18. The following table presents statements you are supposed to indicate your level of your or disagreement where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree

Statement	**1**	**2**	**3**	**4**	**5**
Automation of the cargo valuation system has improved the accuracy and consistency of customs revenue collection in Tanzania					
Automation of the cargo valuation system has reduced the incidence of under- or over-valuation of goods in customs declaration in Tanzania					
Automated cargo valuation system has increased compliance and deterrence of fraudulent practices in customs revenue collection in Tanzania					
Cargo valuation system has contributed to the overall revenue collection performance of the customs department in Tanzania					
Implementation of the cargo valuation system has positively impacted the customs revenue collection performance of the Tanzania Revenue Authority (TRA)					

SECTION E: CUSTOMS REVENUE COLLECTION PERFORMANCE

19. How do you rate the customs revenue collections performance in terms of compliance rate?

1= High 2 = Moderate 3= Low

1. Using a five-point rating scale where 1= strongly disagree, 2= disagree, 3=neutral, 4= agree and 5= strongly agree, to what extent do you agree or disagree with following statements on customs revenue collection performance? **Check in the appropriate box.**

Statements	**1**	**2**	**3**	**4**	**5**
Customs department in Tanzania has been successful in reducing the incidence of revenue fraud and corruption					
Customs department in Tanzania has provided clear guidance and instructions on revenue collection procedures to promote compliance among stakeholders					
Customs department in Tanzania has implemented effective measures to improve compliance rate in revenue collection					
Customs department in Tanzania has been successful in achieving a high level of compliance rate in revenue collection					
Customs department in Tanzania has implemented effective measures to address non-compliance and revenue leakages					

20. How do you rate the customs revenue collections performance in term of increased transparency?

1= High 2 = Moderate 3= Low

1. Using a five-point rating scale where 1= strongly disagree, 2= disagree, 3=neutral, 4= agree and 5= strongly agree, to what extent do you agree or disagree with following statements on customs revenue collection performance? **Check in the appropriate box.**

Statements	**1**	**2**	**3**	**4**	**5**
customs department in Tanzania has made efforts to increase transparency in response to public demand and feedback					
customs department in Tanzania is open and honest about their revenue collection activities					
customs department in Tanzania has become more transparent in their revenue collection process					
customs department in Tanzania provides clear and understandable information about its revenue collection process level of compliance rate in revenue collection					
Customs department in Tanzania has implemented effective measures to address non-compliance and revenue leakages					

APPENDIX II: KII Guide

1. How has electronic cargo tracking system helped you as customs department, especially when trying to ensure that goods are not dumped in the country?
2. The main role of customs valuation system is to determine the value of imports for purposes of matching the custom duties. How is the current customs valuation system playing this role? Has this system increased chances of collecting more tax revenue than before?
3. How has cargo scanner technology affected customs operations in your stations? And how is the information generated by the cargo scanner technology shared with other relevant departments?
4. At the moment, what do you think are the main challenges facing transition to the TANCIS? And if you were to address these challenges, what will be your first thing to do?

Appendix III: Research Permit

JAMHURI YA MUUNGANO WA TANZANIA

WIZARA YA ELIMU, SAYANSI NA TEKNOLOJIA

MOSHI CO-OPERATIVE UNIVERSITY (MoCU)
CHUO KIKUU CHA USHIRIKA MOSHI

OFISI YA MAKAMU MKUU WA CHUO

06 Barabara ya Sokoine, 25121 Mfumuni,
S. L. P. 474, Moshi, Tanzania, Simu: +255 272751833,
Barua pepe: vc@mocu.ac.tz, Tovuti: www.mocu.ac.tz

Unapojibu tafadhali taja:
Kumb. Na. /MoCU/MBM/237/20/14 **Tarehe:** 03 Oktoba, 2023

Meneja wa Mkoa,
Mamlaka ya Mapato Tanzania (TRA),
S. L. P. 1582,
KILIMANJARO.

YAH: KIBALI CHA KUFANYA UTAFITI KWA WANAFUNZI WA CHUO KIKUU CHA USHIRIKA MOSHI (MoCU)

Tafadhali husika na kichwa cha habari hapo juu.

Madhumuni ya barua hii ni kumtambulisha kwako **Ndugu Paulina R. Kyenche** mwanafunzi wa Chuo Kikuu cha Ushirika Moshi ambaye kwa sasa anatarajia kufanya utafiti katika eneo lako.

Maombi haya yamezingatia Waraka wa Serikali wenye Kumb. Na. MPEC/R/10/1 wa tarehe 7 Julai, 1980 pamoja na Hati Idhini ya Chuo Kikuu Cha Ushirika Moshi (MoCU). Moja ya majukumu ya Chuo ni kufanya tafiti na kutumia matokeo ya tafiti hizo katika kufundishia. Aidha, wanafunzi hufanya tafiti kama sehemu ya masomo yao wakiwa Chuoni.

Ili kufanikisha utekelezaji wa tafiti hizo, Makamu Mkuu wa Chuo hutoa vibali vya kufanya tafiti nchini kwa wanataaluma na wanafunzi kwa niaba ya Serikali na Tume ya Sayansi na Teknolojia.

Hivyo basi, tunakuomba umpatie mwanafunzi aliyetajwa hapo juu msaada atakaouhitaji ili kufanikisha utafiti wake. Gharama za utafiti atalipia mwenyewe. Msaada anaouhitaji ni kuruhusiwa kuonana na viongozi na wananchi ili aweze kuzungumza nao kuhusiana na utafiti wake. Aidha, endapo kuna maeneo yanayozuiliwa kufanyika kwa shughuli hii, tafadhali mjulishe hivyo.

Mada ya utafiti wa mwanafunzi aliyetajwa hapo juu ni: **"Effect of Customs System Automation on Revenue Collection Performance. A Case of Customs Department in Kilimanjaro Region, Tanzania".**

Maombi haya ni kwa ajili ya utafiti utakaofanyika **Ofisi ya Mkoa TRA - Kilimanjaro** kuanzia tarehe 16 Novemba, 2022 hadi 16 Novemba, 2023.

Wako katika ujenzi wa Taifa,

.....
Prof. Alfred S. Sife
MAKAMU MKUU WA CHUO

Nakala kwa: Paulina R. Kyenche (Mtafiti)

Appendix IV: Research Permit

MAMLAKA YA MAPATO TANZANIA

TRA/KLM/HRO/T. 245 **16 Oktoba, 2023**

Makamu Mkuu wa Chuo
Chuo Kikuu cha Ushirika Moshi (MoCU)
S. L. P 474
Moshi

YAH: **KIBALI CHA KUFANYA UTAFITI KWA MWANAFUNZI NDUGU PAULINA R. KYENCHE**

Tafadhali rejea barua yako ya tarehe 03 Oktoba, 2023 yenye Kumbukumbu Namba MoCU/MBM/237/20/14 inayohusu somo tajwa.

Napenda kukujulisha kuwa ombi lako la mwanafunzi **Ndugu Paulina R. Kyenche** kuja kufanya utafiti katika ofisi yetu limekubaliwa kwa muda ulioomba.

Nakutakia majukumu mema.

"Pamoja Tunajenga Taifa Letu"

Marium Nyalandu
Kny: Meneja wa Mkoa
Kilimanjaro

IMETHIBITISHWA ISO 9001 : 2015
MENEJA WA MKOA
S.L.P. 1582, Kilimanjaro, Tanzania

Appendix V: Plagiarism Report

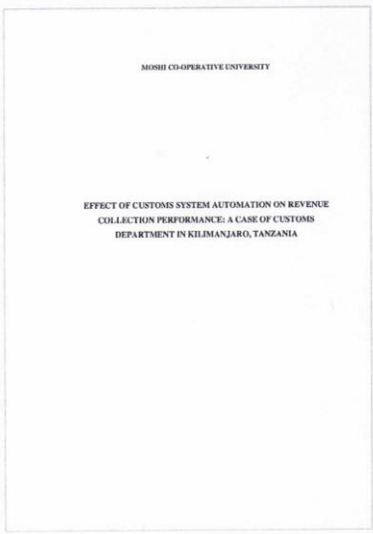
turnitin

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	EXAVERY ANTHONY
Assignment title:	EFFECT OF CUSTOMS SYSTEM AUTOMATION ON REVENUE C...
Submission title:	EFFECT OF CUSTOMS SYSTEM AUTOMATION ON REVENUE C...
File name:	PAULINA_reaearch.docx
File size:	7.26M
Page count:	106
Word count:	27,055
Character count:	168,977
Submission date:	04-Dec-2023 11:11AM (UTC+0300)
Submission ID:	2247251722



MOSHI CO-OPERATIVE UNIVERSITY

EFFECT OF CUSTOMS SYSTEM AUTOMATION ON REVENUE COLLECTION PERFORMANCE: A CASE OF CUSTOMS DEPARTMENT IN KILIMANJARO, TANZANIA

EFFECT OF CUSTOMS SYSTEM AUTOMATION ON REVENUE COLLECTION PERFORMANCE: A CASE OF CUSTOMS DEPARTMENT IN KILIMANJARO, TANZANIA

ORIGINALITY REPORT

17%	16%	4%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	ir.mu.ac.ke:8080 Internet Source	2%
2	scholar.mzumbe.ac.tz Internet Source	1%
3	ikesra.kra.go.ke Internet Source	1%
4	dspace.cbe.ac.tz:8080 Internet Source	1%
5	erepository.uonbi.ac.ke Internet Source	1%
6	Submitted to Wright College Student Paper	1%
7	ir-library.ku.ac.ke Internet Source	1%
8	Submitted to University Der Es Salaam Student Paper	<1%
	sdh.hueuni.edu.vn	

EFFECT OF CUSTOMS SYSTEM AUTOMATION ON REVENUE COLLECTION PERFORMANCE: A CASE OF CUSTOMS DEPARTMENT IN KILIMANJARO , TANZANIA

Paulina Romanus Kyenche[1], Meda T. Mrimi[2] and Mathias Nkuhi[3]*
[1*]Postgraduate student at Moshi Co-operative University, Tanzania
Email: paulinakyenche@gmail.com
[2]Lecturer, Department of Economics and Statistics. Moshi Co-operative University, Tanzania.
[3]Senior Lecturer, Department of Law. Moshi Co-operative University, Tanzania

Abstract

The study assessed the effect of customs system automation on revenue collection performance a case of Customs Department in Kilimanjaro, Tanzania; It examined the impact of electronic cargo tracking system, cargo scanner technology and cargo valuation system on customs revenue collection performance, A cross sectional research design was used to collect data from 141 sampled customs officials and clearing agents who were selected using random sampling and cluster- sampling techniques from customs stations in Kilimanjaro. Self-administered survey questionnaire and interviews were used as methods for data collection. Descriptive statistics, content analysis and Multiple regression model, were used to analyse data. Findings indicated that integrated cargo management technologies, particularly through electronic cargo tracking systems, positively affects compliance rates by improving transparency, accountability, and traceability, while cargo scanner technology and cargo valuation systems have limited influence. Compliance is influenced by various factors, including training, enforcement, regulations, monitoring, and stakeholder behavior. The extensive use of electronic tracking systems may negatively impact transparency, necessitating additional measures such as effective governance, monitoring, and controls. Thus concluded that multifaceted influence of electronic cargo tracking systems on customs compliance. Therefore, the study recommends that the Tanzania Revenue Authority (TRA), the Customs Department, industry associations, and relevant stakeholders prioritize the implementation and utilization of electronic cargo tracking systems,

Key words: Electronic Cargo Tracking System, Cargo Scanner Technology and Cargo Valuation System, Custom Automation, Integrated Cargo management technologies, Revenue Collection Performance

1. Introduction

In the global economy, customs and excise duties have become crucial revenue sources for governments, supporting essential services and economic development. The World Bank urges countries to target at least 15% of their GDP for tax collection, emphasizing its role in meeting citizens' needs and fostering prosperity. Efficient tax collection systems, highlighted by Smith (2010), are essential for a well-functioning infrastructure. Developed nations like Denmark, France, Italy, and Sweden have shifted to automated customs systems, with tax revenue exceeding 40% of their GDP. Sweden's single-window system has notably streamlined customs procedures, significantly improving cargo clearance efficiency and revenue collection (OECD, 2021; Synder, 2017). In the East African region, countries like Kenya and Uganda have avidly embraced automation, implementing systems like ASYCUDA and regional electronic cargo tracking, in line with the East African Community's objective of a unified customs territory. Notably, Uganda experienced a substantial 48% surge in customs revenue in 2015 after automating its customs systems in 2014 (The East African, 2015). Despite considerable investments, Uganda has grappled with persistent challenges in meeting revenue collection targets. Conversely, Kenya displayed resilience in achieving its tax revenue goals in 2020/2021, even amidst economic challenges due to the COVID-19 pandemic (Otieno, 2021).

Tanzania's venture into revenue collection automation commenced in 2005 with the adoption of ASYCUDA, facilitated by the United Nations Conference on Trade and Development (UNCTAD). This shift yielded immediate benefits, drastically reducing goods clearance times and enhancing transparency in customs procedures (UNCTAD, 2022). Subsequent innovations, including the Tanzania-Inter Bank System Scheme (TISS) and the transition to Tanzania's integrated customs system (TANCIS), demonstrate an ongoing dedication to refining and streamlining the customs process (TRA, 2022) Nevertheless, despite these advances, the Tanzania Revenue Authority (TRA) has grappled with persistent challenges in meeting its revenue collection targets, contributing to rising public debt levels (African Development Bank, 2021). In light of this context, this study aims to delve into the effect of customs system automation on customs revenue collection within the Kilimanjaro region of Tanzania. Thus, the study hypothesized that Electronic Cargo Tracking System, Cargo scanner technology and Cargo valuation system have no influence of customs revenue collection.

2. Theoretical Framework

2.1 Technological Determinism Theory

Technological determinism theory is the guiding theory for this study, and it is complemented by systems theory. The later was developed by Thorstein Veblen (1857-1927) who was both an economist and sociologist (Marx and Smith, 1994). The main argument of technological determinism theory is that advancement in technology can be used to solve all societal problems. Marx and Smith (1994) expound on this doctrine by stating that technological determinism theory holds that technological innovations are the primary causes of social progress. In other words, technology determines changes in the society. Taken in the context of this study, development in technology for instance, adoption of cargo scanner technology, electronic cargo tracking system and valuation system should enable the government to meet its tax collection revenue targets. That electronic cargo tracking system should eliminate dumping of goods in the local market. This view is based on the argument that technological inventions such as steam engine had immediate effect on transport system.

While proponents of technological determinism theory have argued that technology alone should be considered as the only driver of societal change, this stance has been widely criticized (Dafoe, 2015). One of the critiques levelled against the theory is that one factor cannot account for entire societal change. According to Dafoe (2015) understanding societal change requires examination of the entire system rather than a single part of the system. This implies that taking a holistic picture of customs systems, examining the systemic failures can help to understand excise revenue collection performance. For instance, even though technological advancement may have introduced electronic processing of customs documents, certain customs officials may still insist using paper documents due to lack of computer knowledge. Similarly, many developing countries are still not able to meet their tax collection targets even after automating their tax administration system. Consequently, system theory, which emphasizes on the whole, will be used in the study to complement technological determinism theory.

2.2 System Theory

The system theory was developed by Ludwig von Bertalanffy (1974), Boulding (1985), Rapoport (1986) and Skyttner (1996). Although the theory was not originally

developed as business theory, its tenets have found major application in organizational management (McSherry and Warr, 2010). The system theory depicts an organisation as an entity made up of various sub-units which are interrelated and combine to make the whole (von Bertalanffy, 1974). Skyttner (1996) explains that system theory main purpose is explaining the whole system and not just part of the organization.

The systems theory underscores that, for organization to achieve its results, every unit has to play its role effectively. As such, it may not be possible to improve revenue collection by just automating customs system. Although the introduction of cargo tracking system, scanner technology and customs valuation system may have reduced clearance time, increased transparency in the system, they are just part of the system and not the whole system. This explains why even after automation; the customs department has not been able to achieve its revenue collection targets. Other factors that might be affecting customs revenue collection need to be examined and identified. In this study, system theory will be used to help understand the effect of whole system; customs automation and other factors on customs department performance.

3. Methodology

The study employed a cross-sectional design for its survey research, allowing for data collection at a single point in time and facilitating the examination of causal-effect relationships between independent and dependent variables. The research was conducted in Tarakea, Holili one stop border post, and Kilimanjaro airport, strategically chosen due to their significance in trade between Kenya and Tanzania. The study targeted customs officials and clearing agents across these three locations, totaling 218 participants. Sample size was determined using Yamane's formula, resulting in a sample of 141 responders. The research utilized both qualitative and quantitative data, with a self-administered survey questionnaire and key informant interviews for data collection. Content validity and reliability tests were performed to ensure data quality. For quantitative analysis, a multiple regression model was used to assess the impact of customs system automation on TRA customs revenue performance, using compliance rate and increased transparency as dependent variables, and electronic cargo tracking system, cargo scanner technology, and cargo valuation system as independent variables

4. Findings and discussion

4.1 The Effect of Integrated cargo management technologies in term of Compliance Rate

Considering integrated cargo management technologies, the multiple regression model on compliance rate that was built and shown in Table 1 below indicates that the electronic cargo tracking system has an impact on compliance rate ($p< 0.05$). Whereas the average compliance rate increases by 0.2 units for every unit increase in the electronic cargo tracking system. While cargo valuation

Table 14 : The Effect of Customs System Automation in term of Compliance Rate

Variable	Coeffient	t	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Electronic Cargo Tracking System	0.2	3.121	**0.002**	0.073	0.327
Cargo scanner technology	-0.124	-0.665	0.507	-0.492	0.244
Cargo valuation system	0.249	1.314	0.191	-0.126	0.624

R Square = 0.660, adjusted R Square = 0.585 Number of observation (N) = 141, **statistically significant at $P < 0.01$,

The findings in Table 1 suggest that the electronic cargo tracking system plays a crucial role in enhancing compliance. It implies that the system provides mechanisms or features that facilitate or incentivize compliance among relevant stakeholders. Furthermore, the findings indicate that the electronic cargo tracking system has various features that might contribute to enhancing compliance, including real-time monitoring, electronic documentation, automated alerts, and improved communication channels. The system improves transparency, accountability, and traceability, making it difficult for non-compliant activities to go unnoticed. The findings reflect the principles of Technological Determinism theory, which posits that technology plays a significant role in shaping and influencing human behavior and societal outcomes. In this case, the electronic cargo tracking system is seen as a technology that has a direct impact on compliance. The features and mechanisms provided by the system, such as real-time monitoring, electronic documentation, and automated alerts, act as drivers for compliance among stakeholders. These technological capabilities enhance transparency, accountability, and traceability, creating an environment that discourages non-compliant activities. The findings suggest that the system itself, through its

technological affordances, influences and shapes the behavior of users and contributes to improving compliance rates .

Also the findings supported with various scholars such as Chen *et al.* (2020) conducted a study in the logistics industry in Ghana and found that companies that implemented electronic tracking systems experienced higher levels of compliance with regulatory requirements. The real-time monitoring and documentation features of the systems were identified as key factors in improving transparency and accountability, leading to increased compliance. Also Sindi and Woodman (2021) conducted a similar study and observed that the implementation of electronic cargo tracking systems resulted in improved compliance rates. The study highlighted the effectiveness of automated alerts and improved communication channels in detecting and preventing non-compliant activities. The researchers concluded that these features played a significant role in enhancing compliance and reducing instances of fraud and smuggling. Odago *et al.* (2021) investigated the impact of electronic cargo tracking systems on compliance. Their findings demonstrated that the implementation of such systems led to increased compliance rates and reduced instances of non-compliance. The electronic documentation and traceability features were identified as crucial in promoting compliance among importers, exporters, and customs authorities also reflected with the study by Hrouga *et al.* (2022) examined the impact of electronic tracking systems on compliance in the logistics industry. The results showed that companies that implemented such systems experienced higher levels of compliance with regulatory requirements compared to those without such systems. The real-time monitoring and documentation features of the electronic tracking systems were found to improve transparency and accountability, leading to increased compliance.

Similarly, a study conducted by Tan and Sundarakani (2021) in the maritime industry found that the implementation of electronic cargo tracking systems led to improved compliance rates. The study highlighted the effectiveness of automated alerts and improved communication channels in detecting and preventing non-compliant activities. The researchers concluded that these features of the electronic tracking systems played a significant role in enhancing compliance and reducing instances of fraud and smuggling. Another relevant study by Mwelu (2021) investigated the impact of electronic cargo tracking systems on compliance in the customs and border control

context. The findings revealed that the implementation of such systems resulted in increased compliance rates and reduced instances of non-compliance. The electronic documentation and traceability features of the systems were identified as key factors in promoting compliance among importers, exporters, and customs authorities. Furthermore, the key informant supported that

> ‘’…….. *the automated alerts provided by the system is the valuable tool in promoting compliance. The system programmed to generate alerts for any suspicious or non-compliant activities, allowing authorities to intervene and investigate potential violations promptly. These alerts serve as deterrents to illicit practices and encourage stakeholders to adhere to the prescribed rules and regulations……..’’* (Holili OSBP: 09 May, 2023*)*

Another added that

> “……. *Our system allows for seamless information sharing between different stakeholders, including customs officials, shipping agents, and transport operators. This enhanced communication enables collaborative efforts in ensuring compliance, as stakeholders can exchange real-time data, coordinate actions, and address any concerns or discrepancies promptly…’’* (Tarakea: 17 May, 2023). Thus it is important of allocating resources towards electronic cargo tracking systems in order to bolster compliance

The cargo scanner technology and cargo valuation system variables do not show a statistically significant eff**e**ct on the compliance rate. The beta coefficient for cargo scanner technology is -0.124, indicating a negative relationship, but the t-value of -0.665 and the high p-value of 0.507 suggest that this relationship is not significant. Similarly, the cargo valuation system has a beta coefficient of 0.249, indicating a positive relationship, but the t-value of 1.314 and p-value of 0.191 indicate that this relationship is also not statistically significant. These findings indicate that, within the context of the study, the implementation or improvement of cargo scanner technology and the cargo valuation system may not be key drivers of compliance within the customs system and these findings contradict the principles of Technological Determinism theory. According to Technological Determinism, technology is believed to have a direct and significant impact on shaping human behavior and societal outcomes.

One key informant stated that

> "……. *while cargo scanner technology is a useful tool for identifying potential risks and contraband, its impact on overall compliance is limited. Compliance is more influenced by factors such as effective training and enforcement measures*……..."(KIA: 29 May,2023)

> Another informant mentioned that "……*the cargo valuation system, although important for ensuring accurate assessment of duties and taxes, does not directly impact compliance. Compliance is driven by other factors such as the regulatory framework, monitoring mechanisms, and the behavior and motivation of stakeholders*……."(Holili OSBP:10 May, 2023)

Also a study conducted by Venkatesh *et al.* (2020) examined the determinants of compliance behavior among importers. The findings revealed that while technology, such as electronic systems and automation, played a role in facilitating compliance, other factors such as the clarity of regulations, effective enforcement, and the attitudes and beliefs of importers were also significant contributors to compliance outcomes. Similarly, a study by Cui *et al.* (2019) explored the factors influencing compliance with customs regulations in the context of cross-border e-commerce.

The researchers found that while technological solutions, such as electronic data interchange and risk management systems, contributed to compliance, other factors such as trust in the regulatory environment, the responsiveness of customs authorities, and the availability of supportive infrastructure were also crucial in determining compliance levels. Furthermore, a study conducted by Ermasova *et al.* (2021) investigated compliance behavior in the context of tax evasion. The findings indicated that technological tools, such as electronic filing and digital audit trails, had a positive impact on compliance, but their effectiveness was contingent upon complementary factors such as fair enforcement, clear communication, and the perceived fairness of the tax system. The study findings underscore the multifaceted nature of compliance within the customs system. It is evident that technology, although influential, is not the sole determinant of compliance. The regulatory environment, training and enforcement

measures, and stakeholder behavior all interact with technology to shape compliance outcomes.

4.2 The Effect in Term of Increased Transparency

The electronic cargo tracking system has an impact on increased transparency, as shown by Table 6 multiple regression model, which was fitted and shows this effect ($p< 0.05$). Increased electronic freight tracking results in a 0.16-unit loss in increased transparency on average for every one-nit increase. Contrary to popular belief, increased transparency is not much impacted by cargo scanner technology or cargo value systems.

Table 15 : The Effect in Term of Increased Transparency

Variable	β	t	Sig.	95.0% Confidence Interval	
				Lower Bound	Upper Bound
Electronic Cargo Tracking System	-0.161	-2.811	0.006	-0.275	-0.048
Cargo scanner technology	0.176	1.056	0.293	-0.154	0.507
Cargo valuation system	-0.253	-1.489	0.139	-0.589	0.083

R Square = 0.827, adjusted R Square = 0.674, Number of observation (N) = 141, **statistically significant at $P < 0.01$,

The findings from Table 2 reveal that the variable "Electronic Cargo Tracking System" has a statistically significant negative effect on increased transparency within the customs system. This means that as the implementation or utilization of electronic cargo tracking systems increases, there is a corresponding decrease in transparency. The negative effect of the "Electronic Cargo Tracking System" variable on increased transparency suggests that as electronic cargo tracking systems are implemented or utilized more extensively, transparency within the customs system decreases. Transparency is crucial for revenue collection performance as it ensures that all transactions, assessments, and payments are conducted openly and in accordance with regulations. It allows for effective monitoring and auditing of revenue-related activities, reducing the potential for fraud, corruption, and revenue leakage.

The decrease in transparency associated with the implementation or utilization of electronic cargo tracking systems raises concerns regarding the accuracy and reliability of revenue collection. Without adequate transparency, there is a higher risk of undervaluation, misclassification, or manipulation of cargo information, which can

lead to revenue losses for the government. Study in Indonesia: A study conducted by Gurning (2019) in Indonesia explored the impact of electronic cargo tracking systems on customs processes and transparency. The findings revealed that the implementation of such systems improved efficiency and reduced administrative delays. However, the study also highlighted challenges related to transparency. It emphasized the need for continuous monitoring and evaluation of the system's transparency aspects to ensure that it aligns with the government's revenue collection objectives.

The study findings supported by Hanrahan *et al.* (2019) examined the implementation of electronic cargo tracking systems in South Africa. The research highlighted that while these systems improved efficiency and risk management, there were concerns about transparency in revenue collection. The study emphasized the importance of establishing strong governance mechanisms and transparency measures to address potential issues arising from the use of technology in customs processes. Also the study by Kuteyi and Winkler (2022) in Brazil explored the impact of electronic cargo tracking systems on customs operations and transparency. The study found that while these systems facilitated automation and reduced processing times, there were challenges related to transparency and integrity in revenue collection. It emphasized the need for comprehensive controls and auditing mechanisms to ensure transparency and prevent revenue leakage. Also the key informant added that

> "……*while electronic cargo tracking systems streamline processes and improve risk management, there is a need for careful attention to transparency. The digitization of customs procedures are accompanied by training programs for our staff to address any potential abuses or manipulation of data….* (Tarakea:19 May, 2023).

Therefore, can be argued that the implementation or utilization of electronic cargo tracking systems holds promise for enhancing transparency and efficiency in revenue collection practices. Thus, the transparency concerns need to be addressed through monitoring, evaluation, governance mechanisms, and comprehensive controls to maintain the accuracy and reliability of revenue collection processes in customs revenue collection.

The study findings indicate that Cargo scanner technology and Cargo valuation system do not have relationship with increased transparency in the customs system. This implies that the implementation or enhancement of these technologies may not be crucial factors driving transparency. It is important to recognize that while these technologies may have value in other aspects of customs operations, their direct impact on transparency may be limited in the specific context of this study. Nonetheless, their contributions to efficiency, risk management, and revenue assessment accuracy should not be overlooked. These findings contradict the principles of Technological Determinism theory, which posits that technology has a direct and significant impact on shaping human behavior and societal outcomes. According to Technological Determinism, the implementation or enhancement of Cargo scanner technology and Cargo valuation system would be expected to have a clear and positive influence on increased transparency in the customs system. While the study findings supported by For instance, a study conducted by Kibiy (2020) in Portugal examined the impact of cargo scanner technology on customs operations and transparency. The findings revealed that while the implementation of cargo scanner technology improved efficiency and risk management, it did not have a significant impact on transparency. The study highlighted the importance of complementary measures, such as effective governance and transparency mechanisms, to ensure transparency in customs processes. Similarly, a study by Dere (2021) in Bangladesh investigated the effect of Cargo valuation system on revenue transparency in customs operations. The results indicated that while the implementation of the Cargo valuation system contributed to accurate assessment of duties and taxes, it did not have a direct influence on overall transparency.

6 Conclusion and recommendations

6.1 Conclusion

The study's findings highlight the positive impact of electronic cargo tracking systems on compliance rate within the customs system, with features like real-time monitoring and improved communication fostering transparency and accountability. However, cargo scanner technology and cargo valuation systems showed limited influence on compliance rates. In terms of transparency, extensive use of electronic tracking systems

led to decreased transparency, necessitating complementary measures such as effective governance.

6.2 Recommendations

The Tanzania Revenue Authority (TRA) and the Customs Department should prioritize the implementation and utilization of electronic cargo tracking systems. The authorities play a vital role in customs revenue collection and should invest in these technological solutions to enhance compliance rates. By leveraging real-time monitoring, electronic documentation, automated alerts, and improved communication channels, TRA and the Customs Department can improve transparency, accountability, and traceability, thus discouraging non-compliant activities.

REREFENCES

Otieno, J. (2021). KRA defies covid to beat revenue collection target for 2020-21. [https://www.the-star.co.ke/news/2021-07-03-kra-defies-covid-to-beat-revenue-collection-target-for-2020-21/] site visited on 9/3/2022

Sindi, S. and Woodman, R. (2021). Implementing commercial autonomous road haulage in freight operations: An industry perspective. Transportation Research Part A: Policy and Practice, 152, 235-253.

Tanzania Revenue Authority (2022). Which customs functional systems has TANCIS integrated? Retrieved from: https://www.tra.go.tz/inde x.php/faqs/404-which-customs-functional-systems-has-tancis-integrated.

Twaweza, (2017). Health check: A citizens' diagnosis of health sector challenges, Twaweza East Africa: Dar es Salaam, Tanzania. 12pp

UNCTAD (2019). ASYCUDA marks 30 years of helping customs boost revenue. Retrieved from: https://unctad.org/news/asycuda-marks-30-years-helping-customs-agencies-boost-revenue

UNCTAD (2019). ASYCUDA-Automated system for customs data. Retrieved from: https://unctad.org/system/files/official-document/tc2015d1rev2_S03 _P05.pdf

UNCTAD (2022). Customs automation- ASYCUDA. Retrieved from: https://unctad.org/topic/transport-and-trade-logistics/customs-automation-ASYCUDA

UNDP (2022). The SDGs in action. [https://www.undp.org/sustainable-developmen t-goals]

United Nations (2012). Customs automation. Trade facilitation implementation guide. Retrieved from: https://tfig.unece.org/contents/customs-automation. htm

Venkatesh, V., Zhang, A., Deakins, E. and Mani, V. (2020). Drivers of sub-supplier social sustainability compliance: an emerging economy perspective. Supply Chain Management: An International Journal, 25, 655-677.

World Customs Organisation (2022). What is customs valuation? Retrieved from: http://www.wcoomd.org/en/topics/valuation/overview/what-is-customs-valuation.aspx

World Trade Organization (2022). Technical information on customs valuation. Retrievedfrom:https://www.wto.org/english/tratop_e/cusval_e/cusval_info_e. htm