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**THE EFFECT OF ELECTRONIC CUSTOMS MANAGEMENT
SYSTEM ON SERVICE DELIVERY BY MYANMAR CUSTOMS**

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**THE EFFECT OF ELECTRONIC CUSTOMS MANAGEMENT
SYSTEM ON SERVICE DELIVERY BY MYANMAR CUSTOMS**

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requirements for the degree of Master of Marketing Management
(MMM)

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ABSTRACT

This study examined the effect of electronic customs management systems on service delivery at the Yangon International Port. It specifically assessed the roles of the electronic customs clearance system, electronic customs revenue system, and electronic customs risk analysis system. The sample size was determined using Cochran's formula, and 360 importers and exporters were selected through simple random sampling. A quantitative research method was employed, using descriptive statistics, correlation, and regression analysis to evaluate data collected from respondents through structured questionnaires. The findings revealed that overall perceptions of the customs systems were high, with the risk analysis and clearance systems having the most significant positive influence on service delivery. In contrast, the revenue system did not show a statistically significant effect. Further analysis confirmed that the risk analysis system was the strongest predictor of effective service delivery. Based on these results, the study recommends that customs authorities prioritize investments in automation, risk profiling, and clearance efficiency to improve performance. Continued system upgrades, user support, and adoption of advanced technologies will be essential to enhancing trade facilitation and operational effectiveness at the port.

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF FIGURES	vi
CHAPTER I INTRODUCTION	1
1.1 Rationale of the Study	3
1.2 Objectives of the Study	6
1.3 Scope and Method of the Study	6
1.4 Organization of the Study	7
CHAPTER II THEORETICAL BACKGROUND	8
2.1 Electronic Customs Management System	8
2.2 Service Delivery and Customer Satisfaction	10
2.3 Related Theories	11
2.4 Previous Studies	14
2.5 Conceptual Framework of the study	18
CHAPTER III PROFILE AND SERVICE OF ELECTRONIC CUSTOMS MANAGEMENT SYSTEM AND SERVICE DELIVER BY MYANMAR CUSTOMS AT MYANMAR INTERNATIONAL PORT	22
3.1 Profile of Myanmar Customs	22
3.2 Electronic Customs Management System	23
3.3 Service Delivery at Yangon International Port	25
CHAPTER IV ANALYSIS OF ELECTRONIC CUSTOMS MANAGEMENT SYSTEM AND DELIVERY	27
4.1 Research Design	27
4.2 Profile of the Respondents	28
4.3 Reliability Analysis of the Electronic Customs Management Systems on Service Delivery	29
4.4 Analysis of Customers Perception on the Electronic Customs Management Systems	30

4.5	Correlation Analysis of Electronic Customs Management Systems on Service Delivery	36
4.6	Analysis on the Effect of Electronic Customs Management Systems on Service Delivery	38
CHAPTER V	CONCLUSION	40
5.1	Findings and Discussions	40
5.2	Suggestions and Recommendations	42
5.3	Needs for Further Study	44
REFERENCES		
APPENDICES		

LIST OF TABLES

Table No.	Particular	Page
4.1	Demographic Factors of the Respondents	28
4.2	Result of Cronbach's Alpha Value	30
4.3	Mean Values of Electronic Customs Clearance System	31
4.4	Mean Values of Electronic Customs Revenue System	32
4.5	Customer Perception on Electronic Customs Risk Analysis System	33
4.6	The Electronic Customs Management Systems	34
4.7	Mean Value of Service Delivery	35
4.8	Relationship among Electronic Customs Management Systems and Service Delivery	37
4.9	The Effect of Electronic Customs Management Systems and Service Delivery	38

LIST OF FIGURES

Figure No.	Particular	Page
2.1	Influence of Electronic Customs Management Systems on Service Delivery	15
2.2	Influence of Electronic Customs Management Systems on Service Delivery	17
2.3	Conceptual Framework	19

CHAPTER I

INTRODUCTION

From its establishment, the Myanmar Customs Department has played a pivotal role in promoting international trade and safeguarding the nation's fiscal interests. In its earliest years, the Department's mandate centered on verifying the legitimacy of goods entering and leaving the country, collecting duties and taxes, and enforcing trade regulations. Importers, exporters, freight forwarders, and customs brokers converged upon the Customs House—first in Yangon, then progressively at Thilawa, Mawlamyine, Sittwe and other international ports—to submit physical documents, obtain seals and stamps, and await manual inspections of cargo. This paper-based, counter-to-counter approach required traders to navigate a labyrinth of forms—commercial invoices, bills of lading, certificates of origin, inspection reports and numerous supplementary permits—each bearing the handwritten annotations of customs officials.

Although the human element allowed for discretionary judgment and relationship-building between officers and stakeholders, it also introduced variability in processing times. Peak periods often saw long queues of container-laden trucks stretching beyond port gates; administrative bottlenecks were common when staffing levels fell short of seasonal surges or new regulatory measures. Documented service standards—such as clearance within 72 hours for standard consignments—proved aspirational rather than attainable. Parallel challenges emerged on the revenue side: discrepancies between manual duty calculations and post-audit findings, occasional lapses in reconciled accounts, and the difficulty of tracking payments across multiple banks and cash counters.

In response to these operational constraints, the Government of Myanmar, in collaboration with the Japan International Cooperation Agency (JICA), initiated a comprehensive modernization of customs procedures. After extensive stakeholder consultations, system design workshops and pilot testing, the Myanmar Automated Cargo Clearance System (MACCS) was officially rolled out in November 2016. MACCS represents the Department's first fully integrated Electronic Customs Management System (ECMS), uniting four core modules—clearance, revenue, risk

analysis and management reporting—within a web-based platform accessible to both customs officers and licensed traders.

Under the traditional regime, declarations were processed sequentially: lodged at one window, examined at another, assessed by a third division, and finally released once all dues were paid. By contrast, MACCS automates this entire cycle. Traders lodge declarations online and upload supporting documents; the system instantly verifies data against tariff schedules and prior records; risk profiles are generated by rule-based engines; duties are calculated in real time; and payments can be settled via electronic banking gateways. Officers monitor each transaction through a centralized dashboard, intervening only when exceptions arise. As a result, low-risk consignments can clear customs within hours rather than days, while high-risk shipments receive prioritized physical inspections.

Beyond speed, MACCS enhances transparency and accountability. All user actions are logged, creating immutable audit trails that facilitate post-clearance reviews. Automated validation checks flag discrepancies—such as mismatches between declared and actual commodity codes—before goods depart the terminal. Performance metrics, once manually compiled, are now available in real-time reports: system uptime, average transaction times, inspection throughput and revenue reconciliation figures. These analytics empower senior management to make data-driven decisions on resource allocation, training needs and process refinements.

Importantly, the transition to an ECMS has reshaped stakeholder relationships. Licensed traders—ranging from multinational importers of machinery to small-scale exporters of agricultural produce—access a single portal for multiple declarations across different ports. Customs brokers, once bound by office hours, can submit and amend entries at any time, reducing the need for overtime staffing. The Department’s helpdesk, integrated into MACCS, provides instant messaging support and knowledge-base articles, further reducing reliance on face-to-face consultations.

Despite these advances, challenges remain. Connectivity issues in remote border posts can disrupt system access, compelling officers to revert to manual procedures temporarily. Some traders, accustomed to informal channels, initially resisted the perceived rigidity of rule-based risk assessments. The Department

responded by rolling out targeted training programs and establishing mobile support units to visit border offices, ensuring uniform uptake of MACCS functionalities.

This study examines how the introduction of MACCS has transformed service delivery within the Myanmar Customs Department's international ports. Drawing on both quantitative performance data and qualitative feedback from officers and traders, it assesses the system's impact along three key dimensions: timeliness, accuracy and stakeholder satisfaction. We further explore how technological factors (system quality, perceived usefulness) and human factors (staff competency) interact to shape operational efficiency, which in turn mediates overall service delivery outcomes.

By situating MACCS within the broader trajectory of customs modernization, this research not only evaluates its current performance but also identifies lessons for future enhancements—such as expanding connectivity to inland posts, integrating blockchain for enhanced document security, and leveraging machine learning to refine risk-scoring algorithms. Ultimately, the findings aim to inform both policy-makers and practitioners on best practices for implementing ECMS in developing country contexts, and to contribute to the evolving literature on e-government transformation in revenue authorities.

1.1 Rationale of the Study

Effective customs administration lies at the heart of any nation's capacity to facilitate legitimate trade, secure revenue, and protect against illicit activity. In Myanmar, the Customs Department has historically shouldered these responsibilities through paper-based processes that, while familiar, have proven increasingly untenable in the face of rising trade volumes and complexity. Manual lodgments, multi-counter verifications and ad hoc risk assessments introduced delays, inconsistencies and opportunities for error—all of which undermined the twin goals of expeditious clearance and accurate revenue collection. Moreover, stakeholders—from multinational importers to local freight forwarders—faced unpredictable processing times and limited visibility into the status of their consignments.

Against this backdrop, the Department's collaboration with the Japan International Cooperation Agency (JICA) to develop and deploy the Myanmar Automated Cargo Clearance System (MACCS) in November 2016 marked a decisive shift toward digital transformation. MACCS unifies three core functions—customs

clearance, revenue management and risk analysis—within a single, web-based platform. Each function contributes distinct but interrelated value: the clearance module accelerates document acceptance and cargo release; the revenue module automates duty calculation and payment reconciliation; and the risk analysis module applies rule-based profiling to prioritize high-risk shipments for inspection. By embedding these functions in real time, MACCS promises not only to streamline operations but also to generate comprehensive audit trails and data analytics for continuous performance monitoring.

Despite the system's technical sophistication, its real-world effects on service delivery and trade facilitation remain under-examined in the Myanmar context. International studies of electronic customs management systems (ECMS) document improvements in transaction speed, cost reduction and revenue assurance (e.g., Almutairi & Song, 2019; Wang et al., 2021), yet the specific mechanisms through which clearance, revenue and risk modules interact to shape user satisfaction and operational efficiency have varied across jurisdictions. In some developing countries, for instance, network connectivity constraints and limited staff training have attenuated potential gains (Khan et al., 2020). In others, enhancements in risk management have paradoxically slowed low-risk flows by imposing rigid targeting rules (Silva & Lee, 2018). These mixed findings underscore the need for a context-sensitive evaluation that encompasses both technological and human dimensions.

First, system quality—the degree to which an ECMS is reliable, responsive and user-friendly—directly influences the speed and accuracy of customs transactions. High system uptime, intuitive interfaces and rapid response times reduce processing bottlenecks and minimize manual interventions. Conversely, downtimes or confusing workflows can force officers back to paper, negating intended efficiencies. Second, perceived usefulness, or the extent to which officers and traders believe the system adds tangible value, affects adoption rates and the thoroughness with which users engage with available features. When stakeholders recognize benefits—such as faster cargo release or clear audit logs—they are more likely to shift longstanding manual habits to the electronic platform. Third, staff competency shapes how effectively the platform's capabilities are realized. Even the most advanced ECMS will underperform if users lack adequate training or the confidence to troubleshoot basic issues.

These three antecedent variables—system quality, perceived usefulness and staff competency—converge to influence operational efficiency, defined here as the internal reduction of manual steps, paper transactions and exception handling. Operational efficiency serves as a mediating construct that translates technological and human inputs into observable improvements in two key outcomes: service delivery and trade facilitation.

- Service Delivery: This encompasses timeliness (the proportion of declarations processed within published service standards), accuracy (concordance between system-calculated duties or risk classifications and subsequent audits) and stakeholder satisfaction (users’ perceptions of transparency, ease of use and responsiveness). Improvements in any dimension can bolster confidence in the customs regime, reduce demurrage costs for importers and optimize resource allocation for the Department.
- Trade Facilitation: Beyond core service metrics, trade facilitation captures the broader economic impact of faster, predictable customs processes on supply chain actors. It includes reductions in clearance lead times, increased cargo throughput at ports, and enhanced competitiveness of Myanmar’s export products in international markets.

By examining how MACCS’s clearance, revenue and risk modules jointly contribute to operational efficiency, and subsequently to service delivery and trade facilitation, this study addresses several critical gaps. Firstly, it provides empirical evidence on the interplay between technological performance and human factors in a developing-country ECMS rollout. Secondly, it disaggregates the effects of each module—recognizing that improvements in revenue accuracy may not always correlate with faster clearance times, and that risk-based inspections, while essential for enforcement, may inadvertently slow legitimate trade if not finely calibrated. Thirdly, it bridges a methodological divide by combining quantitative system log data (e.g., transaction timestamps, error rates) with qualitative stakeholder feedback, thereby capturing both measured performance and lived user experiences.

The significance of this inquiry extends to policymakers and practitioners beyond Myanmar. Many emerging economies are embarking on similar customs modernization initiatives under regional trade agreements or donor-funded programs.

Insights into the facilitators and barriers of MACCS adoption—particularly the relative weight of system design versus user training, or the trade-offs inherent in risk management rules—can inform future deployments and upgrades. Moreover, by articulating a comprehensive conceptual framework that links antecedent variables through operational efficiency to downstream outcomes, this research contributes to the academic discourse on e-government performance, public sector innovation and supply chain digitalization.

In sum, the rationale for this study rests on the imperative to evaluate Myanmar’s pioneering ECMS within its unique institutional and infrastructural context, to disentangle the distinct roles of clearance, revenue and risk modules, and to assess their combined impact on the twin goals of efficient service delivery and robust trade facilitation. Such an evaluation not only illuminates MACCS’s transformative potential but also yields actionable recommendations for enhancing customs performance in Myanmar and comparable environments.

1.2 Objectives of the Study

The main objective of this study is to evaluate the impact of the Myanmar Automated Cargo Clearance System (MACCS) on service delivery within the Myanmar Customs Department, with particular attention to how its core functions contribute to operational performance. The study is guided by the following specific objectives:

1. To identify and document the key practices, processes, and operational mechanisms involved in the implementation of the Electronic Customs Management System (ECMS) within the Myanmar Customs Department.
2. To analyze the extent to which the ECMS has influenced service delivery—particularly in terms of efficiency, transparency, and user satisfaction—at Myanmar’s international ports..

1.3 Scope and Method of the Study

In this study, the primary focus was on determining how the implementation of computerized customs management systems impacts the provision of services at the Myanmar Port. For the purpose of this study, a quantitative research approach was utilized. Primary and secondary sources of information were utilized. A sample size of 360, which represents thirty percent of the total number of importers and exporters

operating at the Myanmar Port during the period of March to April 2025, was chosen through the use of a straightforward random sampling technique.

In order to collect data through the use of Google Forms, structured questionnaires with a Likert scale of five points were utilized. Official records from the Myanmar Port, relevant textbooks, past research papers, and web sources were consulted in order to collect secondary data. The techniques of descriptive statistics, reliability testing, correlation analysis, and regression analysis were utilized in order to conduct the analysis of the data.

1.4 Organization of the Study

This study investigation is comprised of five separate chapters that are independently written. The justification for the study, the objectives of the inquiry, the scope and technique of the study, as well as the layout of the paper, are all included at the beginning of the first chapter, which serves as an introduction to the study. The second chapter of the paper contains the conceptual framework of the investigation, as well as the past research, the associated theories for electronic customs administration systems, and the theoretical underpinning of the study. The purpose of this chapter is to offer an overview of Myanmar Port, including its profile and electronic information services. In the fourth chapter, an analysis of the factors that have an impact on the delivery of services at Myanmar Port is offered. These factors include electronic customs management systems. In conclusion, the findings and comments, as well as thoughts, recommendations, and the crucial need for more study, are offered in the fifth chapter of the report.

CHAPTER II

THEORETICAL BACKGROUND

This chapter provides the theoretical foundation for the study of Electronic Customs Management Systems (ECMS), particularly the Myanmar Automated Cargo Clearance System (MACCS), and their role in enhancing service delivery. It explains the concepts and functions of ECMS, structured around its three key modules: customs clearance, revenue collection, and risk analysis. The chapter also draws upon established theories of service delivery and customer satisfaction to connect technological implementation with measurable improvements in public service performance and trade facilitation.

2.1 Electronic Customs Management Systems

Electronic Customs Management Systems (ECMS) are digital platforms developed to streamline the core functions of customs operations, including document processing, payment of duties, cargo control, and risk profiling. These systems replace traditional, paper-based procedures with real-time electronic interactions among customs authorities, traders, brokers, and other stakeholders (Widdowson et al., 2008; Grainger, 2014).

Modern ECMS aim to improve operational efficiency, transparency, and compliance in customs processes. According to World Customs Organization (2018), such systems support border agencies by integrating automation into clearance procedures and providing decision-support tools to manage risk and ensure revenue collection. In the case of Myanmar, MACCS was introduced in 2016 to align with international best practices in digital trade facilitation. It automates customs declarations, duty assessments, payment processing, and cargo release, while promoting transparency and reducing human contact in clearance procedures.

Through the MACCS platform, Myanmar Customs Department can offer real-time monitoring, automated alerts, digital audit trails, and direct links with financial institutions and licensing authorities. These features reflect the broader goals of ECMS in reducing delays, enhancing service reliability, and fostering stakeholder confidence (UNCTAD, 2019; OECD, 2021).

2.1.1 Electronic Customs Clearance System

The electronic customs clearance system is a core component of ECMS, designed to handle export and import declarations, verify documentation, calculate duties, and authorize cargo release. It replaces face-to-face lodgment and manual verification with digital submission and automatic processing. According to Widdowson et al. (2008), electronic clearance systems are critical for accelerating border procedures and ensuring uniform application of regulations.

In Myanmar, the MACCS clearance module enables traders to submit declarations through an online portal and upload necessary documents in digital form. The system validates information such as Harmonized System (HS) codes, assesses duties automatically, and determines inspection channels based on risk profiles. These automation features significantly reduce clearance times, improve document accuracy, and limit opportunities for informal payments (Grainger, 2014; World Bank, 2020).

Research by Tijan et al. (2019) also confirms that electronic customs clearance systems enhance service delivery by improving transaction speed, reducing paperwork, and enabling 24/7 access. In MACCS's case, declarations are processed more efficiently, and green-channel consignments can be cleared within hours, thereby supporting predictable logistics planning and trade competitiveness.

2.1.2 Electronic Customs Revenue System

The electronic customs revenue system refers to the use of information technology in automating the assessment, collection, and reconciliation of customs duties and taxes. This module is embedded in ECMS platforms to ensure accuracy, eliminate manual cash handling, and reduce the risk of fraud (OECD, 2021).

In Myanmar, MACCS includes an electronic payment gateway that connects with designated banks and allows importers to pay duties via deposit accounts or online payment channels. Duty calculations are based on system-generated tariff schedules, and payments are verified instantly upon confirmation. This has streamlined the revenue collection process and improved transparency in public financial management.

Although the revenue system plays a supportive role in the customs process, its contribution to service delivery is often indirect. It enhances user convenience and accountability but may have limited visibility from the trader's perspective compared

to clearance and risk systems (World Bank, 2020). Nonetheless, the ability to settle payments remotely and trace all transactions electronically strengthens trust in the customs process and reduces administrative burden for both officers and users.

2.1.3 Electronic Customs Risk Analysis System

The risk analysis system is a decision-support component of ECMS that applies intelligence and data analytics to identify potentially high-risk shipments and allocate them to appropriate inspection channels. The system replaces subjective decision-making with standardized, rules-based profiling to promote fairness, efficiency, and compliance (WCO, 2018).

MACCS applies this approach through its selectivity module, which automatically assigns green, yellow, or red channels to each declaration based on criteria such as trader history, commodity type, and risk score. High-risk shipments are subject to document checks or physical inspection, while low-risk goods are cleared without delay. This not only increases enforcement precision but also minimizes disruption to legitimate trade (Tijan et al., 2019).

By enabling focused inspections and reducing the volume of physical checks, the risk module supports faster throughput and better allocation of customs resources. As noted by UNCTAD (2019), automated risk analysis plays a pivotal role in modernizing border procedures and enhancing service quality.

2.2 Service Delivery and Customer Satisfaction

When evaluating the performance of an ECMS, it is necessary to take into account the impact that it has on service delivery, which may be described as the quality, dependability, and responsiveness of the services that are delivered to end users. According to the definition provided by Parasuraman et al. (1988), service quality is defined as the evaluation that a customer makes on the quality of service performance. This evaluation is influenced by factors such as responsiveness, assurance, and empathy. In public services such as customs, where punctuality, openness, and professionalism all play a role in determining the level of pleasure experienced by customers, these concepts are particularly pertinent.

Research conducted by Parasuraman et al. (2013) indicates that customer satisfaction occurs when the perceived performance of a service either meets or

surpasses the expectations of the user. This is in line with the disconfirmation hypothesis, which proposes that pleasure is the result of a disparity between the outcomes of the service that was expected and those that were actually provided (Oliver, 1997). The speed and accuracy with which declarations are processed, the clarity of communication, and the dependability of the system as a whole are all factors that can have an impact on a customer's level of satisfaction in the context of customs.

The implementation of MACCS in Myanmar is intended to bring about improvements in all three of these aspects. As an illustration, decreased clearance times are indicative of responsiveness; the automatic duty calculation system guarantees dependability; and online status tracking enhances communication and transparency. Not only do these characteristics improve consumer happiness, but they also contribute to larger trade facilitation aims. They do this by enhancing predictability, reducing transaction costs, and providing assistance for compliance.

Electronic Customs Management Systems, such as MACCS, are implemented with the intention of revolutionizing the way in which customs operations provide services. The three primary components—the clearing, income, and risk modules—each perform distinct but interconnected duties that, when combined, contribute to an increase in user satisfaction, efficiency, and transparency. This research is based on models of public service delivery and technological adoption, which are backed by empirical findings from research conducted on a global and regional scale. The theoretical underpinning for this study is built in theories. Understanding the role that information and communication management systems (ECMS) play in molding the perceptions of stakeholders and the results of operations is vital for the efficacy of policy and the improvement of institutions as Myanmar continues its pursuit of trade facilitation and digital transformation.

2.3 Related Theories

This section provides an overview of the fundamental ideas that serve as the theoretical basis for comprehending the manner in which users adapt and react to the deployment of the Electronic Customs Management System in Myanmar. The Technology Acceptance Model, the Theory of Reasoned Action, and the Diffusion of Innovation Theory are some examples of these types of theories. These models, when taken as a whole, provide an explanation for the behavioral, cognitive, and social

elements that impact the adoption and continued use of digital technologies in public service contexts, such as MACCS.

2.3.1 Technology Acceptance Model (TAM)

A theory that is considered to be a basic theory in the field of information systems is the Technology Acceptance Model, which was established by Davis (1989). This article provides an explanation of how people learn to embrace and utilize new technologies, with a particular focus on two crucial factors: perceived utility and perceived ease of use. The term "perceived usefulness" relates to the extent to which a person feels that utilizing a certain system would improve their performance on the job, whereas "perceived ease of use" refers to the degree to which the system is regarded to be easy to use (Davis, 1989; Venkatesh & Davis, 2000).

In the context of customs clearance, TAM has been utilized extensively for the purpose of assessing the implementation of e-government and digital platforms. In the case of customs officers, for instance, research has demonstrated that they are more inclined to interact with MACCS if they perceive that it helps cut clearing times, enhance paperwork accuracy, and lessen manual chores (Al-Gahtani, 2016; Alshibly, 2014). In addition, according to Venkatesh and Bala (2008), a system that is user-friendly and simple to run has a greater chance of gaining acceptability across users who have diverse degrees of digital literacy.

TAM is particularly pertinent to this study because it offers a systematic method for evaluating the ways in which system quality and user experience impact the acceptability of MACCS and, ultimately, the success of MACCS in enhancing service delivery in Myanmar's customs operations.

2.3.2 Theory of Reasoned Action (TRA)

Fishbein and Ajzen (1975) developed the Theory of Reasoned Action, which states that a person's behavioral intention is formed by two primary elements: their attitude toward the conduct, and their subjective standards. Both of these components are referred to as the motivational factors. To put it another way, an individual will participate in a behavior if they had a favorable experience with it and if they perceive that others, such as their coworkers or bosses, anticipate them to engage in that conduct.

This theory is applicable to the processes of customs modernization, in which the decision to employ systems such as MACCS may not be based purely on technological characteristics but may also be influenced by the norms and expectations of the workplace. For instance, if customs officers believe that the implementation of MACCS is in accordance with professional norms and the objectives of the institution, then they are more likely to make frequent use of it (Ajzen, 1991; Pavlou & Fygenson, 2006). Similarly, if traders see that their colleagues or competitors are already utilizing the strategy successfully, they may be more likely to adopt it themselves.

According to Cheng, Lam, and Yeung (2006), TRA has been utilized in a number of research on the subject of evaluating behavior in e-government services. These studies have brought to light the importance that institutional culture and social impact play in either supporting or impeding adoption. Because of this, it lends credence to the current study's emphasis on the ways in which organizational and peer dynamics influence MACCS adoption and performance among students.

2.3.3 Diffusion of Innovation Theory (DOI)

Rogers (2003) put up the Diffusion of Innovation Theory, which investigates the process by which inventions spread within a social system over the course of time. Relative advantage, compatibility, complexity, trialability, and observability are the five characteristics that are said to have an impact on adoption, according to the current thinking. A new system's adoption rate and its level of widespread adoption are both determined by these features.

In the context of MACCS, the relative benefit may be observed in the faster clearance times and improved transparency as compared to manual methods. When we talk about compatibility, we are referring to how well MACCS matches with the workflows and user habits that are already in place in customs. Whether or not the system is seen as being user-friendly or challenging is a factor that is considered complex. Observability implies that users are able to clearly see the advantages of adoption, such as real-time tracking and fewer in-office visits (Rogers, 2003; Al-Jabri & Sohail, 2012). Trialability enables users to test the system in phases, while observability means that users can clearly see the benefits of adoption.

In research concerning customs reform and e-government systems, DOI theory has been utilized to describe how innovations succeed or fail based on user perception

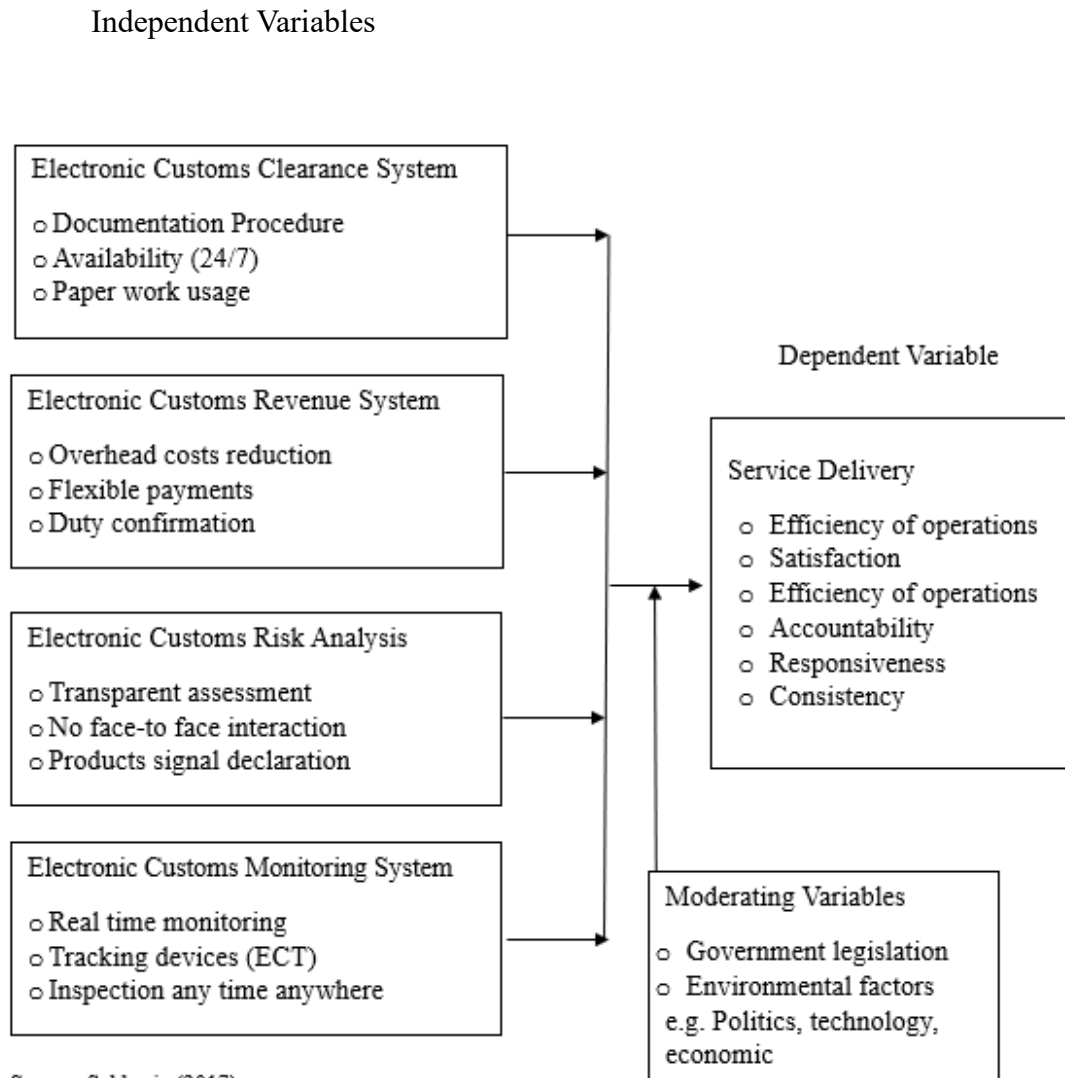
and institutional preparedness (Hussein et al., 2011). This theory was used to explain how innovations are successful or unsuccessful. Putting this paradigm into practice helps identify obstacles that stand in the way of complete implementation of MACCS, particularly in decentralized or high-volume customs stations.

2.4 Previous Studies

Previous Study (1)

Sakhasia (2017) carried out an investigation with the purpose of determining the influence that electronic customs administration systems have on the manner in which services are provided at the Eldoret Kenya Revenue Authority Station. This study's major objective is to explore the influence that electronic customs clearing systems, electronic customs revenue systems, electronic customs risk analysis, and electronic customs monitoring systems have on the delivery of services at the Eldoret Kenya Revenue Authority Station. Specifically, the research will focus on finding out how these systems affect the delivery of services. In order to choose 196 individuals to take part in this research, the sample determination formula that Yamane (1967) devised was applied. The method of data collection consists of conducting interviews with individuals and obtaining testimonials from those persons. The basic conceptual framework that was employed when conducting this research is depicted in the figure that can be seen below.

Figure (2.1) Influence of Electronic Customs Management Systems on Service Delivery



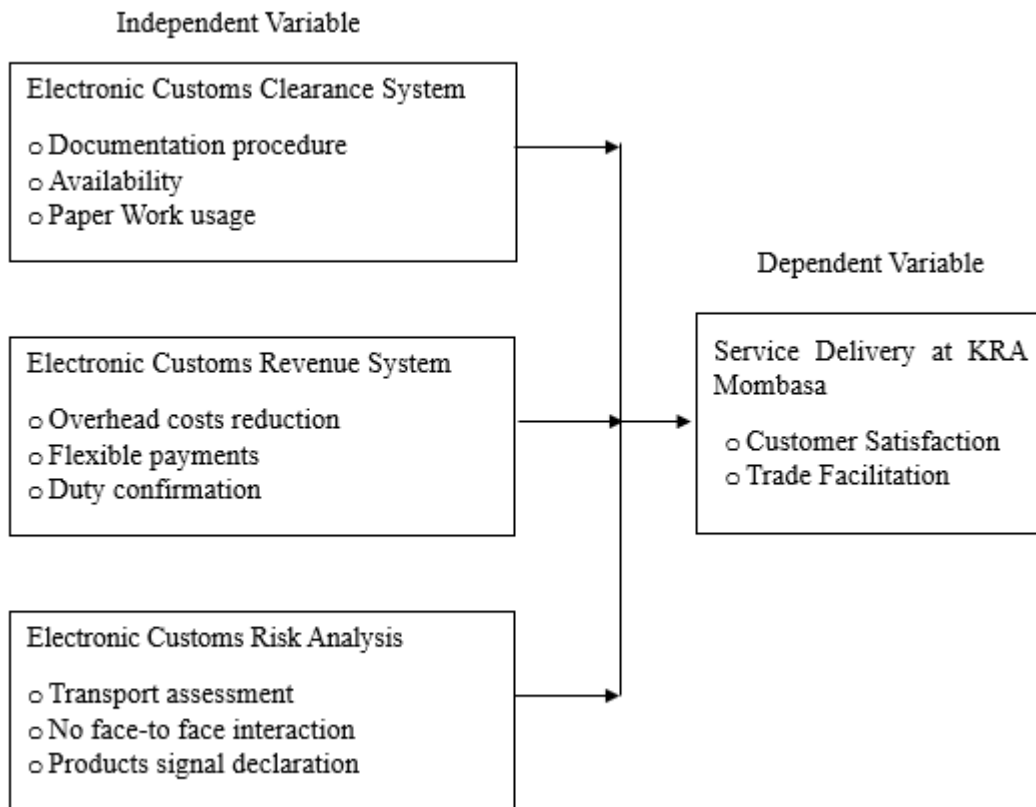
The research conducted by Sakhasia (2017) looked at the impact that computerized customs management systems have on the quality of service that is provided at the Eldoret Kenya Revenue Authority Station. In particular, the purpose of the research was to investigate the impact that the electronic customs clearing system, the electronic customs revenue system, the electronic customs risk analysis system, and the electronic customs monitoring system have on the delivery of services at the Eldoret Kenya Revenue Authority Station. The methodology utilized in the study was a descriptive research approach. With a sample size of 196 respondents, the target

audience comprised of customs officers and allied staff at Eldoret station. The sample size was established by utilizing Yamane's (1967) methodology. Interviews and structured questionnaires were used to acquire the primary data for this study. In order to provide a concise summary of the data, descriptive statistics were utilized. These statistics included percentages, frequencies, means, and standard deviations. In addition, inferential statistics, such as correlation and regression analyses, were carried out in order to investigate the connections that exist between the independent variables and the provision of services. Based on the findings, it was determined that every component of the electronic customs management system had a substantial impact on the delivery of services by enhancing the efficiency, accuracy, and transparency of the process. According to the findings of the study, continual system updates and capacity building for staff are required in order to further improve service delivery.

Previous Study (2)

Lusweti, C. M. (2020) conducted research to determine the effect that computerized customs administration systems had on the delivery of services at the Kenya Revenue Authority in Mombasa. The objectives were to study the impact of three systems on service delivery at the Kenya Revenue Authority in Mombasa: electronic customs clearance, electronic customs revenue, and electronic customs risk analysis. In this study, an explanatory research technique was applied, and the research was directed by three different theories: the capacity approach, the diffusion of innovation theory, and the technological adoption model. There are two of these hypotheses that are considered to be theories. For the purpose of this study, the primary data was collected through the utilization of structured questionnaires, and the target populations consisted of 108 employees from the departments of clearing, revenue collection, and risk. Through the utilization of Yamen's equations, an estimation of the sample size of 85 workers from the KRA was carried out. Examples of descriptive statistics that were produced include percentages, frequencies, means, and standard deviations. These statistics were constructed with the intention of capturing the features of the variables that were being investigated. To further study the nature of the link that exists between the independent factors and the dependent variables, inferential statistics such as Pearson correlation and regression were established. These statistics were produced in order to investigate the nature of the relationship.

Figure (2.2) Influence of Electronic Customs Management Systems on Service Delivery



Source: Lusweti, C. M. (2020)

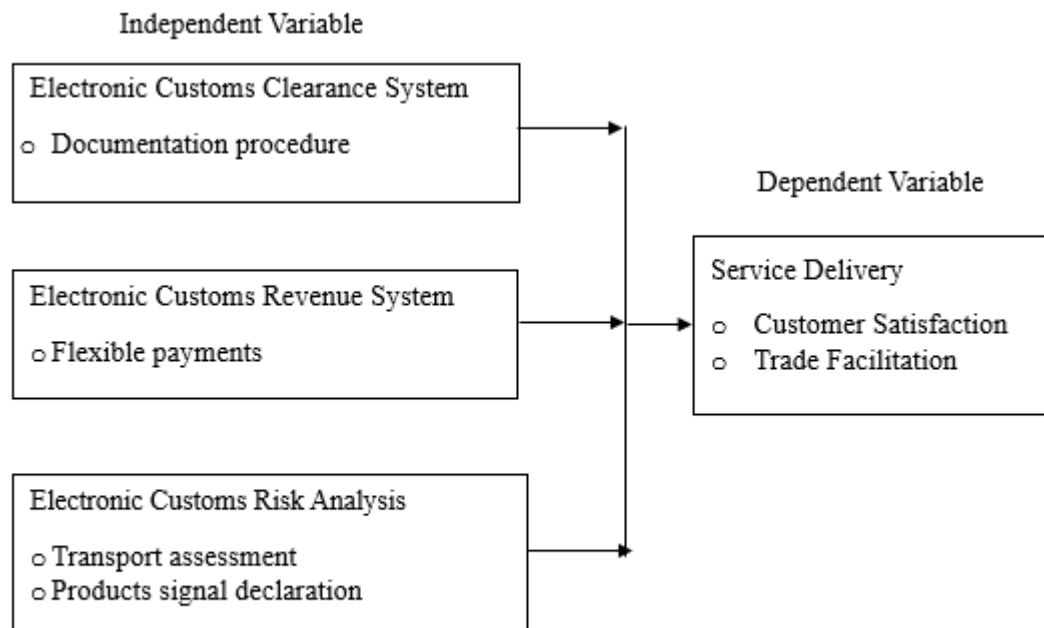
According to the findings of the study, the clearing of customs has a discernible impact on the supply of services. Additionally, it was established that the clearing of customs is a substantial contributor to the supply of services. In addition, the investigation revealed that there was a link between the electronic customs revenue system and service delivery that was above moderate and considerable. Additional findings from the study revealed that the computerized customs revenue system makes a substantial contribution to the delivery of services. According to the findings of the study, electronic customs administration systems, electronic customs clearing systems, electronic customs revenue systems, and electronic customs risk analysis systems all have a major impact on service delivery. Furthermore, these technologies also contribute to the enhancement of service delivery at the Kenya Revenue Authority Headquarters in Mombasa. ,, It was recommended in the study that in order to address monitoring issues, the KRA should make sure that they work together with trucking companies to adopt the most recent tracking devices that are difficult to manipulate.

Additionally, in order to reduce the risks associated with customs services, the KRA should make sure that they upgrade their software on a regular basis in order to reduce the number of instances in which networks are jammed.

2.5 Conceptual Framework of the Study

The operational realities of Myanmar Customs and the agency's efforts to improve service delivery through digital transformation served as the basis for the development of the conceptual framework that will be used in this study. For the purpose of streamlining basic customs services, such as clearance processes, revenue collection, and risk management, the Myanmar Automated Cargo Clearance System (MACCS) was implemented. The MACCS, which is a consolidated computerized platform, plays an important part in supporting efficient cargo processing, lowering the amount of paperwork involved in customs processes, and promoting transparency amongst the parties involved. The system provides importers and exporters with increased predictability, decreased clearing times, and access to information in real time. These are all characteristics that are vital to the development of trust and the enhancement of customer satisfaction. In this study, the results of service delivery are conceptualized in connection to three interconnected components of the MACCS. These components are the revenue system, the risk analysis system, and the electronic customs clearing system. At the Yangon International Port, each of these components makes a distinct contribution to the efficiency, dependability, and responsiveness of the customs services that are provided.

Figure (2.3) Conceptual Framework



Source: Own Compilation, 2025

By analyzing the specific effects of an Electronic Customs Management System (ECMS) on service delivery at Myanmar's international ports, the aforementioned study builds upon previous research that investigates how information systems influence organizational outcomes (for example, Nguyen & Simkin, 2017; Ritala et al., 2019). This research explores how information systems influence organizational outcomes. Earlier studies have focused primarily on adoption drivers (Alanzi et al., 2018) or user satisfaction metrics (Chen & Huang, 2020). However, this investigation takes into account both technological and human factors, specifically system quality, perceived usefulness, and staff competency, in order to evaluate the combined impact of these factors on delivery timeliness, accuracy, and stakeholder satisfaction. By embedding these constructs inside a single conceptual framework, we are able to evaluate not only the direct linkages, but also the mediating impact of operational efficiency. This allows us to extend the performance models that are currently used by the government to the customs setting in Myanmar.

Working Definition

Electronic Customs Clearance System – MACCS Clearance Module

The Electronic Customs Clearance System refers to the module within the Myanmar Automated Cargo Clearance System that automates export–import declarations, document acceptance, and cargo release. Operated by the Myanmar Customs Department since November 2016, it replaces manual lodgment with real-time electronic workflows to ensure consistency with national guidelines on movement of goods and people.

Electronic Customs Revenue System – MACCS Revenue Module

This term designates the component of MACCS responsible for calculating, collecting, and remitting customs duties and other charges. Through integrated tariff schedules and payment gateways, the module streamlines revenue collection, enabling the Department to track receipts electronically and reconcile transactions against official accounts.

Electronic Customs Risk Analysis System – MACCS Risk Module

The Risk Analysis System describes the MACCS function that applies rule-based engines and data-mining algorithms to screen declarations for potential non-compliance or high-risk profiles. Managed centrally by the Customs Department, it prioritizes cargo for physical inspection or further scrutiny, reducing manual profiling and enhancing enforcement consistency.

Electronic Customs Management System – ECMS (MACCS)

ECMS denotes the comprehensive MACCS platform developed in cooperation with JICA that integrates the clearance, revenue, and risk modules into a unified customs management environment. MACCS supports all stages of the clearance cycle and provides dashboards for monitoring performance, exceptions, and audit trails.

Service Delivery via MACCS

Service delivery refers to the Myanmar Customs Department’s provision of clearance, revenue collection, and risk-management services through MACCS. It comprises:

- Timeliness: Proportion of low-risk declarations released within the Department's published standard.
- Accuracy: Alignment between MACCS assessments and subsequent post-audit findings, targeting a minimal error rate.
- Stakeholder Satisfaction: Feedback from licensed traders, freight forwarders, and customs officers on the transparency, ease of use, and responsiveness of the MACCS portal.

CHAPTER III

PROFILE AND SERVICE OF ELECTRONIC CUSTOMS MANAGEMENT SYSTEM AND SERVICE DELIVER BY MYANMAR CUSTOMS AT MYANMAR INTERNATIONAL PORT

The operational profile, key components of the electronic customs management system and factors influencing customs service delivery through MACCS at Yangon International Port are presented in this chapter.

3.1 Profile of Myanmar Customs

The Myanmar Customs Department, operating under the Ministry of Planning and Finance, holds a central role in managing and regulating the flow of goods across the country's borders. Its responsibilities go beyond the collection of duties and taxes; customs officers are also tasked with ensuring compliance with trade policies, facilitating legitimate commerce, and safeguarding the nation's economic interests. With growing trade volumes and increasing integration into global and regional markets—particularly within the ASEAN Economic Community—Myanmar Customs has faced rising expectations to deliver faster, more reliable, and transparent services.

In response to these demands, Myanmar Customs introduced the Myanmar Automated Cargo Clearance System (MACCS), marking a major step toward digitalizing customs operations. First rolled out in 2016 with support from the Japan International Cooperation Agency (JICA), MACCS is an integrated electronic platform designed to modernize key customs functions such as cargo clearance, revenue collection, and risk management. The system allows traders to submit declarations electronically, track processing status, and make payments online, all within a secure and centralized environment.

More than just a technical upgrade, MACCS represents a shift in how customs interacts with its stakeholders—particularly importers, exporters, and logistics service providers. By automating previously manual procedures, the system helps reduce paperwork, minimize delays, and improve predictability in clearance operations. These improvements have a direct impact on service delivery, not only in terms of speed and efficiency but also in building trust and reducing opportunities for errors or miscommunication.

At a broader level, the adoption of MACCS has brought Myanmar’s customs practices more closely in line with international standards, including the Revised Kyoto Convention and the WTO Trade Facilitation Agreement. For businesses operating through the Yangon International Port—the country’s largest and busiest port—MACCS has become an essential tool in navigating an increasingly time-sensitive and compliance-driven trade environment.

This study focuses on how MACCS, through its core components—electronic customs clearance, revenue, and risk analysis systems—contributes to service delivery performance. Understanding how these systems operate in practice provides valuable insights into the strengths and challenges of digital customs reform in Myanmar’s trade landscape.

3.2 Electronic Customs Management System

To modernize its operations and meet the growing demands of international trade, Myanmar Customs has adopted an electronic customs management system through the implementation of the Myanmar Automated Cargo Clearance System (MACCS). This system replaces manual, paper-based procedures with an integrated digital platform designed to improve service efficiency, reduce delays, and ensure greater transparency. MACCS supports three key areas of customs operations: the **electronic customs clearance system**, which streamlines the submission and processing of import and export declarations; the **electronic customs revenue system**, which facilitates accurate assessment and online payment of duties and taxes; and the **electronic risk management system**, which enhances the ability to identify and manage high-risk shipments through automated profiling and targeted inspections. Together, these components form the backbone of Myanmar’s efforts to deliver faster, more reliable, and user-friendly customs services at major entry points such as the Yangon International Port.

3.2.1 Electronic Customs Clearance System

The core function of MACCS is its electronic clearance capability, which allows traders to submit declarations and accompanying documents digitally. Once lodged, the system automatically checks classification codes, calculates duties and taxes, and forwards the declaration to the appropriate customs station for review.

This module enables integration with various government agencies responsible for issuing import licenses and special permits. Users can upload scanned copies of commercial invoices, packing lists, certificates of origin, and licenses in PDF format, replacing the traditional requirement for physical submission.

When the system verifies completeness and compliance, the clearance process continues with minimal human intervention. The assigned clearance channel—green, yellow, or red—is determined by the embedded selectivity module. Green-channel shipments are cleared automatically once duties are paid; yellow-channel cases require document examination; and red-channel cases proceed to physical inspection.

The shift from manual to electronic clearance has brought significant operational improvements, including shorter processing times, fewer clerical errors, and more predictable cargo flows. Customs officers can now focus on exception handling and enforcement, while compliant traders benefit from expedited clearance procedures.

3.2.2 Electronic Customs Revenue System

The revenue module within MACCS has been a major advancement in customs financial operations. It offers multiple options for duty and tax payment: traders may use deposit accounts managed by Customs, or make direct payments through authorized banks.

Deposit account holders can top up their accounts via bank transfer. When a declaration is cleared, MACCS automatically deducts the correct duty amount and records the transaction in the system. This real-time balance adjustment eliminates manual cash-handling and improves transparency in duty settlement.

In 2023, MACCS introduced the Online Payment System (OPS), allowing importers to pay duties through mobile banking or internet banking applications of selected partner banks. When a payment instruction is generated, it can be settled electronically using the customs declaration number and port code. This functionality, initially launched in Yangon, has expanded to other ports and land borders by 2025.

These electronic payment options streamline the revenue collection process and reduce administrative delays. Traders can complete payments without visiting customs offices, and customs officers can verify payment status instantly. The integration with

Myanmar's digital banking infrastructure enhances accountability and simplifies the overall user experience.

3.2.3 Electronic Customs Risk Analysis System

MACCS incorporates an automated risk analysis module to support targeted enforcement. Upon declaration submission, the system evaluates multiple data points such as trader history, shipment type, past infractions, and intelligence alerts. This assessment results in the automatic allocation of the shipment into one of three risk channels: green, yellow, or red.

Green-channel shipments are released immediately upon payment confirmation. Yellow-channel shipments are subject to document verification, and red-channel shipments undergo physical examination by inspection officers. The allocation is based entirely on risk profiles, removing discretionary judgments and ensuring a uniform standard for all users.

This system enables Customs to focus inspection resources on potentially non-compliant or suspicious consignments while allowing compliant shipments to move more quickly. As a result, MACCS has increased both enforcement precision and operational efficiency.

Customs inspectors are able to spend more time on high-risk cases, enhancing border control outcomes. Simultaneously, the majority of traders, whose shipments qualify as low-risk, benefit from reduced clearance times and lower compliance costs.

3.3 Service Delivery at Yangon International Port

The implementation of MACCS has significantly transformed the service delivery model of the Myanmar Customs Department at Yangon International Port. This section highlights the key areas of impact.

3.3.1 Clearance Time and Operational Efficiency

The average time required for customs clearance has been substantially reduced since the deployment of MACCS. Historical data indicate that average clearance times for green-channel shipments have dropped from over 60 hours in the pre-MACCS era to less than 14 hours on average, with some shipments clearing in minutes under optimal conditions.

Yellow-channel declarations now require fewer working hours for review, while red-channel inspections have become more targeted and evidence-based. Although physical inspections still take considerable time, their frequency has decreased due to better risk identification.

MACCS has minimized the need for manual document handling, reducing queues at customs counters and improving processing speed. These enhancements support the Department's objective of facilitating trade while maintaining regulatory oversight.

3.3.2 Transparency, Consistency, and User Confidence

MACCS promotes transparency in customs operations by providing digital traceability at every step. All transactions are time-stamped and stored in the central database, and inspection decisions are recorded and visible to authorized stakeholders. This clarity discourages informal practices and strengthens the rule-based processing environment.

Users benefit from consistent procedures and access to real-time status updates through the system. Errors in duty assessment have been reduced due to automated validation, and misclassification or undervaluation cases are more easily identified and addressed.

Additionally, MACCS allows stakeholders to prepare in advance by knowing which documents are required and what steps must be completed. This clarity has increased trust in customs procedures and improved the Department's public image.

CHAPTER IV

ANALYSIS OF ELECTRONIC CUSTOMS MANAGEMENT SYSTEM AND DELIVERY

This chapter presents the research design, demographic profiles of the respondents, and their perceptions regarding the Electronic Customs Management Systems implemented at the Yangon International Port, along with their corresponding assessments of service delivery effectiveness. In addition, the chapter includes the results of reliability testing conducted on the observed variables to ensure internal consistency. Furthermore, a regression analysis is performed to examine the impact of key factors such as system efficiency, information accuracy, user accessibility, and operational transparency on service delivery. This analysis provides insights into the strength and significance of these relationships within the context of port management and customs operations.

4.1 Research Design

The main goals of this study are to identify electronic customs management systems and examine their impact on Yangon International Port service delivery. Service delivery efficacy is affected by electronic customs management systems like clearance, revenue, and risk analysis. The study uses quantitative methods. The study goals are met via primary and secondary data. The research examines port customers' and customs officers' views on the computerized system's quality and efficiency. Use Cochran's (1963) sampling formula to calculate sample size. Participant selection was simple random sampling. This strategy selected 360 respondents from an estimated 1200 relevant importers and exporters participating in port customs processes.

$$n = \frac{N}{1 + Ne^2}$$
$$n = \frac{8000}{1 + 8000 * 0.05^2}$$
$$\approx 96$$

Where n = sample size

N = population size

e = error (0.05) reliability level 95% or;

e = level of precision always set the value of 0.05

This study uses simple random sampling to acquire primary data from 360 Yangon International Port customs workers. Data is collected using a three-section questionnaire. The first part includes respondent demographics. The second portion examines respondents' views on the electronic customs clearing, revenue, and risk analysis systems. The final segment evaluates port service quality and effectiveness. Participants respond on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Secondary data comes from textbooks, theses, scholarly publications, and trustworthy web pieces. Multiple regression analysis is the main statistical method for analyzing how recognized electronic systems affect service delivery.

4.2 Profile of the Respondents

This section presents the profile of respondents that relates to respondent demographic factors such as gender, age (years), marital status income level, Program, monthly income (Kyats) and occupation and E-learning Usage and behavioral characteristics. Table (4.1) illustrates the demographic factors of respondents.

Table (4.1) Demographic Factors of the Respondents

Sr. No.	Characteristic	Classification	No. of Respondents	Percentage (%)
1	Gender	Male	229	63.6
		Female	131	36.4
2	Age (Years)	Under 25	35	9.7
		Between 26 - 33	217	60.3
		Between 34- 41	78	21.7
		41 and above	30	8.3
3	Experience	less than 5 years	14	3.9
		5-10 years	270	75.0

		above 10 years	76	21.1
4	Education	Master	14	3.9
		Under Graduate	270	75.0
		Graduate	76	21.1

Source: Survey Data, (2025)

This study surveyed 360 Yangon International Port customs workers. The sample was 63.6 percent male and 36.4 percent female. The majority of responders (60.3%) were 26–33 years old. This was followed by 21.7% aged 34–41. 9.7 percent under 25 and 8.3 percent over 41. Many respondents (75.0%) have 5 to 10 years of job experience. Only 3.9 percent of the sample had fewer than 5 years of experience, while 21.1 percent had more than 10 years. Most responders (75.0%) have undergraduate degrees. This was followed by 21.1 percent graduates and 3.9 percent Master's degree holders. These demographic insights are necessary to comprehend the participant profile and their views on the Yangon International Port's Electronic Customs Management Systems.

4.3 Reliability Analysis of the Electronic Customs Management Systems on Service Delivery

Cronbach's Alpha was used for reliability study to assess measurement item internal consistency. Assessing scale and instrument dependability in social science research often uses this method. Before performing correlation and regression analysis, the observed variables' reliability was evaluated to ensure measuring instrument consistency. According to accepted norms, Cronbach's Alpha values near 1.0 indicate great scale dependability and internal consistency.

Table (4.2) Result of Cronbach's Alpha Value

Sr. No.	Variables	No. of items	Cronbach's Alpha
1	Electronic Customs Clearance System	5	0.689
2	Electronic Customs Revenue System	5	0.714
3	Electronic Customs Risk Analysis System	5	0.861
4	Service Delivery	5	0.928

Source: Survey Data, 2025

The variables in this study had Cronbach's Alpha scores from 0.689 to 0.928, indicating different internal consistency across assessment items (Table 4.2). These results show that majority of the study's scales are trustworthy, above 0.70. The variable service delivery has the highest dependability and internal consistency, with a Cronbach's Alpha of 0.928. The computerized customs risk analysis system follows with 0.861, indicating good dependability. Cronbach's Alpha is 0.714 for the computerized customs revenue system, indicating dependability. The electronic customs clearance system has the lowest dependability score of 0.689, yet exploratory research is still possible. The findings support the dependability of this study's research instrument since the measurement items consistently represent their constructs.

4.4 Analysis of Customers Perception on the Electronic Customs Management Systems

Structured surveys collected primary data on customer impressions of Electronic Customs Management Systems' impact on service delivery. Subsections 4.4.1–4.4.4 describe perceptions across variables. This study interprets mean scores using a five-point Likert scale. Mean scores of 1.00 to 1.80 are extremely low, 1.81 to 2.60 low, 2.61 to 3.40 moderate, 3.41 to 4.20 high, and 4.21 to 5.00 very high. This categorization uses Pimentel (2010) standards to standardize descriptive statistics interpretation. This technique promotes clarity and consistency in evaluating stakeholders' assessments of the electronic systems' success in improving Yangon International Port service delivery.

4.4.1 Customers Perception on Electronic Customs Clearance System

The electronic customs clearance, revenue, and risk analysis systems are included in this research.

Customs clearing systems are computerized systems that enforce export and import rules, collect customs charges, and efficiently transport commodities, cargo, and people across borders. Table 4.3 shows item mean and standard deviation values and product component mean values.

Table (4.3) Mean Values of Electronic Customs Clearance System

Sr. No.	Electronic Customs Clearance System	Mean	Std. Deviation
1	The e-clearance systems have shortened long procedures needed for paper documentation	4.75	.434
2	The use of automation has reduced paper work	4.72	.450
3	E-customs service is available 24/7	4.61	.554
4	There is seamless flow of data between MACCS and exporter through use of e-customs	4.09	.786
5	There is prompt feedback when using E-customs at 24/7	4.13	.699
	Overall mean	4.46	

Source: Survey Data, (2025)

Table (4.3) shows Electronic Customs Clearance System perception mean scores and standard deviations. Respondents were largely satisfied with the Electronic Customs Clearance System, scoring 4.46 on average. The highest mean score of 4.75 indicates that respondents strongly agree that the e-clearance system has greatly reduced paper documentation requirements. Automation for paper reduction has a high mean rating of 4.72, showing general acceptance. With a mean of 4.61, e-customs services are also seen as accessible 24/7. However, flawless data transfer between MACCS and exporters 4.09 and timely feedback during 24/7 e-customs use have significantly lower mean scores. 4.13 indicating improvement opportunities.

4.4.1 Customers Perception on Electronic Customs Revenue System

Customs revenue system refers to the comprehensive methods through which a government collects customs revenue by utilizing Information and Communication Technology applications. The five statements are asked to respondents to evaluate their perception on Customs revenue system. The mean and standard deviation values of each item as well as overall mean value of price component are shown in Table (4.4).

Table (4.4) Mean Values of Electronic Customs Revenue System

Sr. No.	Electronic Customs Revenue System	Mean	Std. Deviation
1	Electronic Customs revenue systems have been able to cut cost as a result of using e-customs revenue systems	4.22	.587
2	Making more clearances on products due to use of e-customs resulting to more taxes to the MACCS	4.24	.638
3	The use of the e-customs revenue system ensures instant verification of customs duties paid	4.20	.579
4	The owners of the goods can pay their duties at the comfort of their homes/ offices electronically	4.20	.542
5	Electronic payments augment electronic filling	4.02	.822
	Overall mean	4.18	

Source: Survey Data, 2025

Table 4.4 shows that perceptions of the Electronic Customs Revenue System average 4.18, which is high. This suggests that respondents think the method improves port revenue procedures. The highest-rated item, with a mean score of 4.24, is product clearances owing to e-customs resulting in greater MACCS taxes. The method appears to improve customs revenue operations' efficiency and output. The e-customs revenue system allows quick verification of customs taxes paid, and goods owners may pay their duties online from home or work, both scoring 4.20. The system is convenient

and reliable, according to these results. Electronic customs revenue systems have reduced expenses obtained a somewhat higher mean score of 4.22, indicating their role. Electronic payments supplement electronic filing scored 4.02, not much below the high range, reflecting good attitudes. These items have standard deviations of 0.542 to 0.822, indicating some consensus among responders. These data imply that the Electronic Customs Revenue System streamlines payment procedures, increases transparency, and improves customs operations.

4.4.2 Customers Perception on Electronic Customs Risk Analysis System

To investigate the perception of customers on electronic customs risk analysis system, five statements are asked to the respondents. The mean, standard deviation values for each statement and overall mean value of place component are shown in Table (4.5).

Table (4.5) Customer Perception on Electronic Customs Risk Analysis System

Sr. No.	Electronic Customs Risk Analysis System	Mean	Std. Deviation
1	The use of e-customs has reduced risks associated with clearance of products	4.42	.597
2	Pre-arrival processing and post-clearance audit reduces fraud and improves revenue	4.15	.740
3	Elimination of the need for face-to-face interaction between customs officials and traders reduce corruption incident	4.30	.674
4	MACCS staff regularly use risks management systems	4.38	.741
5	The IT system assigns goods to the green, red, yellow, or blue channel during clearance to ensure appropriate customs processing based on risk assessment	4.15	.783
	Overall mean	4.28	

Source: Survey Data, 2025

Table 4.5 shows that respondents' perceptions of the Electronic Customs Risk Analysis System average 4.28, which is high. This suggests that users think the technology improves customs risk management. E-customs reduces product clearance risks, the highest-rated item with a mean score of 4.42. This implies consensus that the mechanism is essential to reducing clearance risks. The assertion that MACCS officials routinely employ risk management systems obtained a high mean score of 4.38, suggesting customs personnel's trust in its constant use. Preventing customs personnel from meeting traders face-to-face to curb corruption was similarly highly rated, with a mean score of 4.30. This suggests the method improves integrity and transparency.

Risk management features include pre-arrival processing and post-clearance audit to decrease fraud and enhance revenue and automated risk-based assignment of products to clearance channels achieved identical mean ratings of 4.15, indicating strong acceptance. The items' standard deviations were 0.597 to 0.783, indicating consistency. These findings show that the Electronic Customs Risk Analysis System reduces fraud, improves transparency, and boosts customs efficiency.

The summary of overall mean values for each the electronic customs management systems are illustrated in Table (4.6).

Table (4.6) Overall Mean of the Electronic Customs Management Systems

Sr. No.	Particular	Mean
1	Electronic Customs Clearance System	4.46
2	Electronic Customs Revenue System	4.18
3	Electronic Customs Risk Analysis System	4.28

Source: Survey Data, 2025

Table 4.6 shows the mean scores and standard deviations for the three primary electronic customs administration system components. The computerized customs clearance system obtained the highest mean score of 4.46, suggesting that respondents believe it improves customs operations the greatest. This high score indicates significant agreement on its role in simplifying operations, minimizing paperwork, and enhancing port efficiency. With a mean score of 4.28, the computerized customs risk analysis system is thought to reduce fraud, improve transparency, and facilitate risk-

based customs processing. This shows that respondents appreciate the system's role in secure and quick clearance.

The computerized customs revenue system scored 4.18, little lower but still high. This shows that users perceive it as a successful tool for streamlining payment procedures and enhancing revenue collection, albeit it may have more potential for development than the other two systems. Users rate the electronic customs management systems highly for enhancing Yangon International Port service delivery. All three components had mean ratings in the high range. Respondents' consistent perceptions are shown by the low standard deviations.

The Yangon International Port's computerized customs management systems are rated on five items in this research. Table (4.7) showed customer satisfaction mean and standard deviation.

Table (4.7) Mean Value of Service Delivery

Sr. No.	Service Delivery	Mean	Std. Deviation
1	Reducing risks associated with the clearance of goods, the implementation of the e-customs system contributes to faster processing and greater reliability for traders	4.35	.764
2	Preventing fraud and enhancing revenue collection, pre-arrival processing and post-clearance audits support a more efficient and secure trading environment	4.31	.800
3	Minimizing opportunities for corruption, the removal of face-to-face interaction between customs officials and traders improves trust and satisfaction among importers and exporters	4.33	.615
4	Ensuring compliance and streamlining the clearance process, MACCS staff regularly utilize risk management systems	4.29	.562

5	Facilitating smooth and targeted inspections, the IT system automatically assigns goods to the green, red, yellow, or blue clearance channels based on risk analysis, thereby promoting legitimate trade	4.22	.739
	Overall mean	4.30	

Source: Survey Data, 2025

Table 4.7 shows that respondents were very satisfied with customs operations' efficiency and effectiveness after using Electronic Customs Management Systems. The highest mean score is 4.35 for e-customs system decreases goods clearing risks. This suggests responders understand the system's role in speedier processing and trader dependability. The item that stresses limiting corruption by removing face-to-face interaction between customs officers and traders scored 4.33. This suggests customs processes are more trustworthy and transparent. The assertion that pre-arrival processing and post-clearance audits minimize fraud and improve revenue collection scored 4.31, supporting the idea that they make trade safer and more efficient.

The statement that MACCS staff use risk management systems to assure compliance and speed clearance procedures has a mean score of 4.29. The lowest, but still favorable, rating was 4.22 for risk-based automated assignment of products to clearing channels, suggesting support for focused inspections that encourage lawful commerce. The standard deviation numbers, 0.562 to 0.800, indicate a consistent impression across respondents. These results strongly support the Electronic Customs Management Systems' service delivery improvements, notably in dependability, transparency, compliance, and efficiency in customs operations.

4.5 Correlation Analysis of Electronic Customs Management Systems on Service Delivery

Before conducting the multiple regression analysis, this study employs Pearson correlation analysis to examine the relationships between the independent variables—namely the electronic customs clearance system, electronic customs revenue system, and electronic customs risk analysis system and the dependent variable, service delivery. The results of the correlation analysis for the variables in this study are presented in Table 4.8.

Table (4.8) Relationship among Electronic Customs Management Systems and Service Delivery

Sr. No.	Description	Pearson Correlation Coefficient	Sig. (2-tailed)
1	Electronic Customs Clearance System	.512***	.000
2	Electronic Customs Revenue System	.109**	.038
3	Electronic Customs Risk Analysis System	.801***	.000

Source: Survey Data, 2025

** And ***Correction is significant at the 0.05 and 0.01 levels (2-tailed) Dependent variable: Customer Satisfaction

Table (4.8) presents the Pearson correlation coefficients indicating the relationships between the components of the electronic customs management systems and service delivery. The analysis reveals that the electronic customs risk analysis system has the strongest positive correlation with service delivery, with a Pearson correlation coefficient of 0.801 at a significance level of .000. This indicates a very strong and statistically significant relationship, suggesting that improvements in the risk analysis system are closely associated with enhanced service delivery. The electronic customs clearance system also shows a moderate and statistically significant positive correlation with service delivery, with a coefficient of 0.512 and a p-value of .000. This suggests that greater efficiency in customs clearance processes is moderately associated with better service outcomes. In contrast, the electronic customs revenue system demonstrates a weak but statistically significant positive correlation, with a coefficient of 0.109 and a significance level of .038. Although the relationship is relatively low in strength, it still indicates a meaningful connection between revenue system performance and service delivery. These results suggest that all three systems contribute to improved service delivery, with the electronic customs risk analysis system showing the most substantial influence among the independent variables.

4.6 Analysis on the Effect of Electronic Customs Management Systems and Service Delivery

After conducting the Pearson correlation analysis, Multiple Linear regression analysis is done to find the effect of electronic customs management systems on service delivery at the Yangon International Port. The three components: electronic customs clearance system, electronic customs revenue system and electronic customs risk analysis system are considered as independent variables while service delivery is considered as dependent variable. The result of regression analysis is described in Table (4.9).

Table (4.9) The Effect of Electronic Customs Management Systems on Service Delivery

Variables	Unstandardized Coefficients		Standardized Coefficients Beta (β)	t	Sig.	VIF
	B	Customer Error				
(Constant)	-.290	.256		-.136	.257	
Electronic Customs Clearance System	.195***	.058	.127	3.356	.001	1.488
Electronic Customs Revenue System	.071	.046	.050	1.535	.126	1.111
Electronic Customs Risk Analysis System	.800***	.039	.736	.347	.000	1.367
R	.812					
R Square	.660					
Adjusted R Square	.657					

Source: Survey Data, 2025

*** Significant at 1% level, ** Significant at 5% level Dependent Variable: Customers Satisfaction

Multiple regression analysis shows how Electronic Customs Management System components affect Yangon International Port service delivery in Table 4.11. The three independent variables—electronic customs clearance system, revenue system, and risk analysis system—explain 65.7% of service delivery variation, according to the model's R Square value of 0.660 and Adjusted R Square value of 0.657. This shows the model's explanatory strength. The regression model is statistically significant at the 1% level ($p < 0.01$), as indicated by the F-value of 229.922. The Electronic Customs Risk Analysis System is the most influential predictor, with an unstandardized coefficient (B) of 0.800, a standardized beta coefficient (β) of 0.736, and a statistically significant p-value of 0.000. Risk analysis improves customs efficiency, security, and compliance, as shown by its substantial and considerable beneficial influence on service delivery.

$B = 0.195$, $t = 3.356$, and $p = 0.001$ suggest that the Electronic Customs Clearance System improves service delivery. Automating clearance procedures and streamlining documentation may improve service outcomes. A p-value of 0.126, which above the 0.05 criterion, shows that the computerized customs revenue system does not affect service delivery. This model suggests a positive coefficient ($B = 0.071$), although the impact is faint and unsupported. The Electronic Customs Clearance System and Electronic Customs Risk Analysis System considerably improve port service delivery, whereas the Electronic Customs Revenue System does not. These findings demonstrate the need of clearance efficiency and risk management to improve customs service performance.

CHAPTER 5

CONCLUSION

This chapter is structured into three primary sections. The first section presents the key findings and discussion based on the analyses conducted in Chapter Four. The second section offers practical recommendations and suggestions that emerge from the study's findings. The final section outlines the requirements and proposed directions for future research, aiming to extend and deepen the understanding of the subject matter.

5.1 Findings and Discussions

An investigation into the impact that Electronic Customs Management Systems have had on the provision of services at the Yangon International Port is the focus of this study. Through the use of a structured questionnaire, data were gathered from a significant number of potential responders. In this examination, the attention was placed on three essential elements of the customs system: the Electronic Customs Clearance System, the Electronic Customs Revenue System, and the Electronic Customs Risk examination System. In this study, the outcome variable that was evaluated was service delivery.

A closer look at the demographic profile indicated that the bulk of the people who participated in the survey were male and within the age range of younger adults. The majority of them had completed their undergraduate degree and had a number of years of professional experience. Based on these features, it can be deduced that the participants possessed a practical understanding of port operations and were able to successfully evaluate the customs systems.

The descriptive data revealed that the electronic customs clearing system was given the highest overall rating. This indicates that users really valued the role that it played in decreasing the amount of paperwork, shortening the procedures, and giving continuous access. Following closely after was the Electronic Customs Risk Analysis System, which reflected good evaluations of its efficacy in dealing with hazards, fostering openness, and providing assistance for targeted inspections. Additionally, the Electronic Customs Revenue System was given a positive grade, but one that was somewhat lower than the other two components. This indicates that its impact on service delivery is recognized, but it is regarded as being less substantial than the previous two components.

Following the correlation study, it was shown that there are positive and statistically significant links between all three systems and the delivery of services. Following the clearing system as the one with the strongest link was the risk analysis system, which was shown to have the strongest relationship with service delivery. A substantial relationship was also demonstrated by the revenue system, despite the fact that its strength was relatively weak in contrast.

Analysis of regression verified the existence of these patterns. It was proved that the overall model had a good capacity to describe the variation in service delivery, and the statistical test showed that the model was significant. It was determined that the risk analysis system was the most influential factor, demonstrating a significant and favorable contribution to the procedure of service delivery. A large beneficial effect was also brought about by the clearing system, highlighting the significance of this system in terms of enhancing operational performance. On the other hand, the revenue system did not have an influence that was statistically significant, which indicates that it may now play a less important function or that it requires more refinement in order to contribute effectively.

When it comes to molding the attitudes of stakeholders, these findings highlight the significance of risk management and clearance efficiency among other factors. A major improvement in customs operations is demonstrated by the findings, which indicate that technology that is meant to automate risk profiling, eliminate direct human contact, and assure efficient inspections is of great benefit. A further demonstration of the significance of accessibility, speed, and reduced procedures is provided by the robust support for the clearing system. On the other hand, the limited influence of the revenue system may be a reflection of a lack of visibility, a worse performance, or a lesser relevance in the day-to-day experiences of users. When it comes to evaluating the overall quality of the service, it also suggests that customers place a higher priority on operational efficiency and security than they do on money processing.

According to the findings of the study, the electronic customs risk analysis system and the electronic customs clearing system are the primary factors that contribute to the significant enhancement of service delivery at the Yangon International Port. The customs authorities and policymakers that are looking to modernize port operations through digital transformation will find these findings to be extremely relevant information.

5.2 Suggestions and Recommendations

This section presents a number of suggestions with the objective of boosting the delivery of services at the Yangon International Port by means of the enhanced deployment of Electronic Customs Management Systems. Because the electronic customs risk analysis system has such a significant impact on the delivery of services, it is strongly suggested that the authorities in charge of customs continue to invest in the development and optimization of this system through continued investment. A strong emphasis should be made on the maintenance of risk profile tools that are accurate and intelligent, the facilitation of real-time analysis, and the strengthening of automated channeling in order to guarantee that the procedures of cargo clearance are seamless, secure, and efficient. Through the implementation of regular system audits, upgrades, and user training sessions, it will be possible to enhance operational correctness and preserve the confidence of stakeholders.

An further important factor that contributes to the improvement of service delivery is the Electronic Customs Clearance System. As a result, it is recommended to further streamline clearing operations by reducing the number of manual stages, improving connection between customs platforms and trader systems, and making certain that the system is available at all times of the day and night. The reduction of delays and the enhancement of the efficiency of cargo processing at the port may be significantly improved by the implementation of automated document submission, quicker data sharing, and strong technical support. Despite the fact that the Electronic Customs Revenue System shown a comparatively smaller and statistically negligible effect, it continues to make a contribution to the overall efficiency of port operations. The authorities may take into consideration extending functions that provide transparency in duty calculations, simplify electronic payment processes, and encourage instant verification of payments in order to boost the effectiveness of the system. In addition, there should be efforts made to increase knowledge of the benefits of the system and to give clear instructions for users, particularly for importers and exporters who are new to the industry or operate on a small scale. It is recommended that future efforts concentrate on improving the functionality and integration of the revenue system in order to guarantee that all components contribute completely to an environment that is both efficient and dependable in the customs sector.

Support for users and contact with them is another essential aspect that has to be improved. It is suggested that the Myanmar Automated Cargo Clearance System

(MACCS) improve its approach to customer service by providing assistance in a timely manner, manuals that are easy to understand, and support in several languages. Building a specialized helpdesk, providing online chat services, or instituting a ticket-based inquiry system might significantly enhance the overall experience and level of satisfaction of users.

In addition, the findings emphasize the significance of accessibility and usability of the system respectively. The systems should have user interfaces that are easy to understand, layout designs that are consistent, and navigation structures that are straightforward in order to guarantee ease of use. Identifying areas of confusion or inefficiency and guiding modifications that are user-centered may be accomplished through the periodic testing of user experiences and the collecting of feedback of users.

Additionally, in order to acquaint users with the full capabilities of the customs systems, the authorities in charge of customs should establish training programs and awareness campaigns. These activities may include online walkthroughs, workshops, digital tutorials, and seminars that emphasize essential features, updates, and best practices. Moreover, these initiatives may also contain digital tutorials. Enhancing involvement and use of the systems may be accomplished by disseminating information about these enhancements through official websites, emails, and forums accessible to stakeholders.

In order to facilitate ongoing enhancement, it is recommended that performance assessments be carried out on a regular basis through the utilization of structured surveys, key performance indicators (KPIs), and meetings with stakeholders. The information that is gathered through these processes will be used to guide modifications to policies, updates to technology, and strategic objectives. As a final recommendation, it is suggested that the Yangon International Port evaluate its electronic customs systems in comparison to the best practices that are considered to be regional and worldwide. For the purpose of modernizing operations and increasing competitiveness, the adoption of sophisticated technologies such as blockchain for the safe transmission of data, artificial intelligence for the intelligent analysis of risk, and mobile customs solutions can be beneficial. By bringing its digital customs management in line with international standards, the port will be able to guarantee that its service delivery will be effective, transparent, and prepared for the future.

5.3 Needs for Further Study

The implications of computerized customs management technologies on the delivery of services at the Yangon International Port are the sole subject of investigation in this study. Therefore, it is of the utmost importance to carry out more study that investigates the long-term effects of these systems on the efficiency of operations, the convenience of trade, and the satisfaction of stakeholders. Future research should also investigate the behavioral responses, experiences, and views of a wider variety of users, such as customs brokers, freight forwarders, and shipping agents, in order to get a more thorough understanding of the usefulness of the system. In addition, researchers may explore the impact that demographic factors, such as years of experience, employment type, and organizational function, have in modulating the link between the components of the customs system and the outcomes of service delivery. A comparison of the performance of electronic customs systems at various ports or customs checkpoints inside Myanmar or in neighboring countries might potentially be the subject of more research. In conclusion, it is necessary to investigate the incorporation of cutting-edge technologies like artificial intelligence, blockchain, and predictive analytics in order to evaluate the possible impact that these technologies might have on enhancing transparency, risk management, and overall service delivery in digital customs operations.

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APPENDIX-1
QUESTIONNAIRE

Dear Respondents,

Dear Respondents, I am a Master of Marketing Management Customer at Yangon University of Economics. For the completion of master program, I am researching “The effect of electric customs management system on service delivery by Myanmar Customs at Myanmar International Port”. This survey is part of my Master’s thesis. Therefore, I would like to request to complete your responses in this survey. This questionnaire will take your time about five minutes to ten minutes. This research is basically for academic purposes only. Thank you very much for giving your precious time.

Mg Arkar Myat Moe

Section A : Demographic Profiles of Respondent

Instruction: For the following items, please select the option that the best describe you.

1. What is your Gender?
 - a) Male
 - b) Female

2. Define your age
 - a) Under 30 years
 - b) 30 – 50 years
 - c) Above 50 years

3. Indicate years worked in the organization

a) Less than 5 years []

b) 5 – 10 years []

c) Above 10 years []

4. Indicate your highest level of Education

a) Under graduate []

b) Graduated []

c) Master []

Section B: Electronic Customs Clearance System

This section seeks answers to questions relating to electronic customs clearance system and service delivery at Myanmar international port. Please mark (x) in the box which best describes your agreement or disagreement on each of the following statement. Use the following scale 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree

No.	Electronic Customs Clearance System	1	2	3	4	5
1	The e-clearance systems have shortened long procedures needed for paper documentation					
2	The use of automation has reduced paper work					
3	E-customs service is available 24/7					
4	There is seamless flow of data between MACCS and exporter through use of e-customs					
5	There is prompt feedback when using E-customs at 24/7					

Section C: Electronic Customs Revenue System

This section seeks answers to questions relating to electronic customs revenue system and service delivery at Myanmar International Port. Please mark (x) in the box which best describe your agreement or disagreement on each of the following statements. Use the following scale 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree

No.	Electronic Customs Revenue System	1	2	3	4	5
1	Electronic Customs revenue systems have been able to cut cost as a result of using e-customs revenue systems.					
2	Making more clearances on products due to use of e-customs resulting to more taxes to the MACCS.					
3	The use of the e-customs revenue system ensures instant verification of customs duties paid					
4	The owners of the goods can pay their duties at the comfort of their homes/ offices electronically					
5	Electronic payments augment electronic filling					

Section D: Electronic Customs Risk Analysis System

This section seeks answers to questions relating to electronic customs risk analysis system and service delivery at Myanmar international port. Please mark (x) in the box which best describes your agreement or disagreement on each of the following statement. Use the following scale 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5= Strongly Agree

No.	Electronic Customs Risk Analysis System	1	2	3	4	5
1	The use of e-customs has reduced risks associated with clearance of products.					
2	Pre-arrival processing and post-clearance audit reduces fraud and improves revenue					
3	Elimination of the need for face-to-face interaction between customs officials and traders reduce corruption incident					
4	MACCS staff regularly use risks management systems					
5	The IT system assigns goods to the green, red, yellow, or blue channel during clearance to ensure appropriate customs processing based on risk assessment					

SECTION E: Service Delivery MACCS at Myanmar International Port

This section seeks answers to questions relating to service delivery at Myanmar international port as a result of adoption of electronic customs management systems. Please mark (x) in the box which best describes your agreement or disagreement on each of the following statement. Use the following scale 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5= Strongly Agree

No.	Service Delivery of MACCS at Myanmar International Port	1	2	3	4	5
1	The implementation of the e-customs system has reduced risks associated with the clearance of goods, contributing to faster processing and greater reliability for traders					
2	Pre-arrival processing and post-clearance audits help prevent fraud and enhance revenue collection, supporting a more efficient and secure trading environment					
3	Removing the need for face-to-face interaction between customs officials and traders minimizes opportunities for corruption and improves trust and satisfaction among importers and exporters					
4	MACCS staff regularly utilize risk management systems to ensure compliance and streamline the clearance process					
5	The IT system automatically assigns goods to the green, red, yellow, or blue clearance channels based on risk analysis, facilitating smooth and targeted inspections that promote legitimate trade					

APPENDIX II
SPSS OUTPUT DATA

(a) Frequency Table

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	229	63.6	63.6	63.6
	female	131	36.4	36.4	100.0
Total		360	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 25 years	35	9.7	9.7	9.7
	Between 26 - 33 yrs	217	60.3	60.3	70.0
	Between 34- 41 yrs	78	21.7	21.7	91.7
	41 yrs old and above	30	8.3	8.3	100.0
Total		360	100.0	100.0	

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 5 years	14	3.9	3.9	3.9
	5-10 years	270	75.0	75.0	78.9
	above 10 years	76	21.1	21.1	100.0
Total		360	100.0	100.0	

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Master	14	3.9	3.9	3.9
	Under Graduate	270	75.0	75.0	78.9
	Graduate	76	21.1	21.1	100.0
	Total	360	100.0	100.0	

(b) Reliability Test

Reliability Statistics

Cronbach's Alpha	N of Items
.689	5

Reliability Statistics

Cronbach's Alpha	N of Items
.714	5

Reliability Statistics

Cronbach's Alpha	N of Items
.861	5

Reliability Statistics

Cronbach's Alpha	N of Items
.928	5

(c) Descriptive Analysis

1

	N	Minimum	Maximum	Mean	Std. Deviation
C1	360	4	5	4.75	.434
C2	360	4	5	4.72	.450
C3	360	3	5	4.61	.554
C4	360	2	5	4.09	.786
C5	360	2	5	4.13	.699
Valid N (listwise)	360				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Rev1	360	3	5	4.22	.587
Rev2	360	3	5	4.24	.638
Rev3	360	3	5	4.20	.579
Rev4	360	3	5	4.20	.542
Rev5	360	2	5	4.02	.822
Valid N (listwise)	360				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
R1	360	2	5	4.42	.597
R2	360	1	5	4.15	.740
R3	360	2	5	4.30	.674
R4	360	1	5	4.38	.741
R5	360	2	5	4.15	.783
Valid N (listwise)	360				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
D1	360	1	5	4.35	.764
D2	360	1	5	4.31	.800
D3	360	2	5	4.33	.615
D4	360	3	5	4.29	.562
D5	360	1	5	4.22	.739
Valid N (listwise)	360				

(d) Correlation Analysis

Correlations

		C	Rev	R	D
C	Pearson Correlation	1	.287**	.504**	.512**
	Sig. (2-tailed)		.000	.000	.000
	N	360	360	360	360
Rev	Pearson Correlation	.287**	1	.031	.109*
	Sig. (2-tailed)	.000		.554	.038
	N	360	360	360	360
R	Pearson Correlation	.504**	.031	1	.801**
	Sig. (2-tailed)	.000	.554		.000
	N	360	360	360	360
D	Pearson Correlation	.512**	.109*	.801**	1
	Sig. (2-tailed)	.000	.038	.000	
	N	360	360	360	360

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

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

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.812 ^a	.660	.657	.36242	2.456

a. Predictors: (Constant), R, Rev, C

b. Dependent Variable: D

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	90.600	3	30.200	229.922	.000 ^b
	Residual	46.760	356	.131		
	Total	137.360	359			

a. Dependent Variable: D

b. Predictors: (Constant), R, Rev, C

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.290	.256		-1.136	.257	
	C	.195	.058	.127	3.356	.001	.672
	Rev	.071	.046	.050	1.535	.126	.900
	R	.800	.039	.736	20.347	.000	.732

a. Dependent Variable: D

Overall Summary Table

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
C	360	3.40	5.00	4.4583	.40089
Rev	360	3.00	5.00	4.1767	.43791
R	360	2.00	5.00	4.2811	.56891
D	360	1.80	5.00	4.3000	.61856
Valid N (listwise)	360				