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ENHANCING CUSTOMS OPERATIONS THROUGH INFORMATION AND COMMUNICATION TECHNOLOGY ADOPTION: A CRITICAL ANALYSIS OF E-CUSTOMS INITIATIVES IN NIGERIA

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Abstract: The study evaluates the enhancing customs operations through information and communication technology adoption using a critical analysis of e-customs initiatives in Nigeria. The study raised three objectives which are; assess specific e-customs initiatives adopted by the Nigerian Customs Service; identify the challenges hindering effective utilization of ICT and e-customs initiatives within the Nigeria Customs Service. The study was anchored on two theories which are; Diffusion of Innovation Theory and Institutional Theory. The study adopted survey research design. The population of the study comprises various stakeholders directly involved in customs operations and the implementation of E-Customs initiatives in Nigeria. This includes customs officials from different sectors in Nigeria who according to the Permanent Secretary, Ministry of Finance, have a population of about 19,300 officers and men, 2 government stakeholders from Ministry of Interior, 2 Clearing and Forwarding agents in Apapa, 2 Business people engaged in international trade, and 2 technology experts. Therefore, the total population for this study will be 9,308. From all the clusters mentioned. Taro Yamane sample size determination formula was used to arrive at a sample size of 400. Purposive sampling technique was used to administered the instrument to the respondents. Weighted Mean Score (Four Point Likert Scale) was used to analyses the data. The findings of the study revealed that the integration of ICT into customs operations has been aimed at improving efficiency, transparency, and reducing clearance time for goods, as highlighted in both quantitative and qualitative data. The findings of the study revealed the challenges encompass infrastructural issues, personnel-related constraints, and organizational factors that hinder the full potential of ICT solutions in customs operations. The study concluded that the need to enhance customs operations through ICT adoption is imperative for fostering efficient, transparent, and secure international trade. This study provided a nuanced understanding of the factors influencing the successful integration of e-customs initiatives in customs operations in Nigeria, ultimately offering insights that can inform policy decisions and practical implementations.

Keywords: Enhancing, Customs, Operations, Information And Communication Technology, Adoption, Critical Analysis, E-Customs, Initiatives, Nigeria

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Introduction

Information and Communication Technology (ICT) has become a cornerstone for modernizing customs operations globally, including Nigeria. All over the world, customs operations play a pivotal role in facilitating international trade and ensuring the smooth movement of goods across borders. In Nigeria, the Nigeria Customs Service (NCS) serves as the principal agency responsible for regulating and controlling the flow of goods and commodities across the country's borders (Nigeria Customs Service, 2022). The efficient operation of the NCS is vital for the nation's economic development, given that trade contributes significantly to Nigeria's GDP and is an essential source of government revenue (World Bank, 2022).

Traditionally, customs operations have been characterized by manual processes, paperwork, and bureaucratic challenges, leading to inefficiencies, delays, and increased transaction costs for businesses (Carr, 2018; World Bank, 2020). Traditional customs operations have been plagued by a range of challenges, including cumbersome paper-based procedures, lack of transparency, and susceptibility to corruption (De Wulf & Sokol, 2005; Saggi, 2006). The manual processing of trade-related documents and the reliance on physical inspections contribute to delays, increased costs, and a lack of responsiveness to the dynamic nature of global trade flow.

The adoption of Information and Communication Technology (ICT) in customs operations has emerged as a viable strategy to address these challenges and usher in a new era of efficiency, transparency, and security. ICT solutions encompass a wide array of technologies, including electronic data interchange (EDI), risk management systems, automated clearance systems, and online platforms for document submission and payment (UNCTAD, 2019; WCO, 2021). These technologies promise to streamline processes, reduce paperwork, and enhance the overall effectiveness of customs operations.

For instance, in terms of efficiency; ICT simplifies and automates customs procedures, reducing delays and enhancing trade flow. Automated Systems like the Nigeria Integrated Customs Information System (NICIS) streamline processes, reducing manual interventions and minimizing errors.

Electronic Data Interchange (EDI) allows seamless communication between customs, importers, and exporters, speeding up documentation and approvals. Risk Management Systems improves risk-based inspections by ensuring that high-risk consignments are scrutinized while compliant traders face fewer delays (World Customs Organization, 2022).

In promoting transparency, ICT helps by reducing human intervention and digitizing records, ICT curbs corruption and ensures customs operations are more transparent. For instance, the Single Window Platform simplifies document submission and approval, reducing opportunities for bribery. Real-Time Tracking helps Traders to monitor the progress of their consignments, ensuring transparency in duties and taxes applied.

In fostering accountability, ICT enables traceability in customs processes. For instance, audit trails; provides comprehensive logs of transactions, aiding in audits and investigations. Performance Monitoring; facilitates data-driven performance assessments of customs officers, reducing inefficiencies and misconduct.

Recognizing the need for modernization, governments and customs authorities worldwide are increasingly turning to Information and Communication Technology (ICT) adoption as a transformative solution to enhance customs operations through the introduction of E-customs initiatives.

E-customs initiatives are electronic services that aim to improve customs systems for trade and revenue collection. These initiatives help to create a paperless environment for businesses to interact with the Nigeria

Original Article

Customs Service (NCS) and are geared towards increased revenue generation in the NCS. These initiatives include; logistics monitoring, e-cargo tracking; using systems to track the movement of cargo and mobile enforcement where mobile technology is used to eradicate the evasion of tax and duties.

E-customs initiatives are vital for Nigeria's economic development and global trade integration due to their transformative impact on trade, security, and governance as they boost trade and revenue by facilitating trade. E-customs reduces clearance times, enhancing Nigeria's competitiveness in regional and global markets (UNCTAD, 2020).

Additionally, ICT adoption facilitates greater collaboration between customs authorities and the business community, fostering a more conducive environment for international trade.

Several countries have made significant strides in enhancing customs operations through the widespread adoption of ICT. Singapore's National Single Window (NSW) and Estonia's e-Customs system are notable examples, demonstrating how digitalization can lead to dramatic improvements in trade facilitation and regulatory compliance (UNCTAD, 2020; European Commission, 2021). These global best practices serve as valuable benchmarks for other nations seeking to modernize their customs procedures.

Statement of the Problem

Research indicates that the adoption of ICT in customs operations particularly, E-Customs initiative increases revenue collection as automation minimizes tax evasion and under-declaration of goods. E-customs initiatives also enhances on risk mitigation as advanced analytics identify illicit activities and protect border security and combat smuggling (WTO, 2015; ITC, 2018).

The need to enhance customs operations through ICT adoption is imperative for fostering efficient, transparent, and secure international trade. ICT systems like scanners and surveillance technologies improves monitoring of imports and exports thus, the introduction of electronic clearance systems and online documentation is seen as a promising solution to improve efficiency, transparency, and security within the Nigeria Customs Service (NCS). However, despite the benefits of the e-customs initiatives, various challenges persist in the NCS such as, delays and inefficiencies in customs clearance processes often exacerbated by corruption and lack of transparency, which can undermine the effectiveness of ICT solutions. While existing literature provides insights into the benefits of ICT adoption in customs operations in other countries, there is a gap in understanding the extent of ICT adoption in terms of implementing the e-customs initiatives in the Nigeria Customs Service, It is also not clear the challenges that hinder the effective implementation and utilization of e-customs initiatives and how these factors affect trade facilitation, revenue collection, and how the adoption of ICT in customs operations aligns with international best practices and standards, hence, the motivation for this study.

This work therefore is an evaluation of how Customs operations can be enhanced through Information and Communication Technology Adoption: A Critical Analysis Of E-Customs Initiatives in Nigeria.

Objectives of the Study

This study investigated enhancement of customs operations through the adoption of information and communication technology with focus on e-customs initiatives. The specific objectives however are to:

1. assess specific e-customs initiatives adopted by the Nigerian Customs Service
2. identify the challenges hindering effective utilization of ICT and e-customs initiatives within the Nigeria Customs Service.

Original Article

3. [] investigate strategies put in place by the NCS on enhancing effective adoption of e-customs initiatives and ICT for efficient service delivery.

Conceptual Review

Customs

E-Customs, a short form for electronic customs, refers to the adoption and implementation of information and communication technology (ICT) solutions in the customs and trade regulatory environment. The concept encompasses a range of electronic systems, platforms, and technologies designed to streamline and modernize customs operations, transforming traditional paper-based processes into digital, automated, and interconnected systems.

Key Components of E-Customs E-Customs initiatives typically incorporate several key components, including but not limited to:

EDI facilitates the electronic exchange of customs-related information between trading partners, allowing for seamless and standardized communication. It plays a pivotal role in reducing manual paperwork, improving data accuracy, and expediting customs clearance (United Nations Centre for Trade Facilitation and Electronic Business, 2005).

Automated clearance systems utilize: Automated clearance systems utilize technology to streamline and expedite the processing of customs declarations. These systems often employ risk management algorithms, enabling customs authorities to focus their resources on high-risk shipments while facilitating the swift clearance of low-risk consignments (WTO, 2003).

Online Document Submission: E-Customs initiatives often involve the online submission of documents, such as invoices, bills of lading, and certificates of origin. This digitization of documentation accelerates the customs clearance process and enhances transparency (WTO, 2003).

Electronic payment systems: Electronic payment systems integrated into E-Customs platforms allow for the electronic settlement of customs duties and fees. This reduces the reliance on physical payment instruments, contributing to the efficiency and security of customs transactions (United Nations Centre for Trade Facilitation and Electronic Business, 2005).

Risk Management Tools: E-Customs solutions incorporate risk management tools to assess and identify potentially high-risk shipments. By leveraging data analytics and intelligence, customs authorities can allocate resources effectively, mitigating security threats and facilitating legitimate trade (WTO, 2005).

Benefits of E-Customs

The adoption of E-Customs initiatives is associated with several key benefits. E-Customs streamlines customs processes, reducing clearance times and minimizing delays in the movement of goods. This efficiency contributes to the facilitation of international trade (WTO, 2005). The transparency introduced by E-Customs initiatives enhances accountability in customs operations. Stakeholders have increased visibility into the clearance process, reducing the potential for corruption and fraud (United Nations Centre for Trade Facilitation and Electronic Business, 2005).

The digitization of customs procedures reduces the reliance on physical paperwork and manual processes, leading to cost savings for both customs authorities and traders (WTO, 2003). E-Customs contributes to trade facilitation by simplifying procedures and reducing administrative burdens. This encourages international trade

Original Article

by making it more accessible and efficient for businesses (United Nations Centre for Trade Facilitation and Electronic Business, 2005).

While E-Customs initiatives offer significant advantages, challenges and considerations must be addressed, including issues related to infrastructure, cybersecurity, data privacy, and the capacity building of customs officials (WTO, 2003).

E-Customs represents a transformative approach to customs operations, leveraging technology to enhance efficiency, transparency, and trade facilitation. As nations increasingly embrace digital solutions in the customs domain, E-Customs initiatives play a pivotal role in shaping the future of international trade.

History of the Nigeria Customs Service (NCS)

What is now known as the Nigeria Customs Service (NCS) – a paramilitary organization – can be said to have been established a little over a century ago when the British Colonial administration appointed Mr. T. A. Wall, in 1891, as the Director-General of Customs for the collection of inland revenue in the Niger Coast Protectorate. This was the formalization of the duties that the department had been performing under the Royal Niger Company, under the leadership of previous Chief Executives.

The name "Department of Customs and Excise" emerged in 1922 when the first Comptroller of Customs and Excise for the Federation of Nigeria was appointed. Towards the end of 1945, the Customs and Excise Preventive Service was established under the leadership of Mr. Nicol, a Briton. This service comprised two divisions: Maritime and Preventive. The Maritime Division was responsible for collecting import and excise duties, as well as performing other related functions, while the Preventive Division was charged with enforcement duties, including the prevention of smuggling and the arrest and prosecution of smugglers.

Following the promulgation of the Customs and Excise Management Act (CEMA) No. 55 of 1958, the affairs of the department were placed under the management of a board. The Chairman of the Board of Customs and Excise was made the Chief Executive Officer of the department. Mr. E. P. C. Langdon, a Briton, was appointed the first Chairman and Chief Executive Officer in 1959, and he was succeeded by Mr. S. G. Quinton.

The attainment of independence in 1960 led to the Federal Government's Nigerianization policy, which resulted in the appointment of the first Nigerian Chairman of the Board and Chief Executive Officer, Mr. Ayodele Diyan, in 1964. Following his death in 1968, he was succeeded by Mr. Henny Etim Duke.

Decree No. 7 of 1970 granted additional powers and defined the membership of the board. Representatives from the Federal Ministries of Economic Development and Reconstruction, Trade, and Industries were included to broaden the scope of national interests for better guidance in the board's decisions.

E-Governance and E-Customs Implementation: A Global Perspective

During the last decade a revolution in information and communication technologies has been witnessed. This revolution is not only changing the daily life of people but also changing characteristics of the interaction between the governments and their citizens. These changes, in turn, are rapidly being transformed into new forms of government, namely, e-government (e-gov).

E-gov is defined as the use of technology, particularly the Internet, as a means to deliver services to citizens, businesses, and other entities.¹ Operational benefits from the introduction of Internet-based e-commerce, for government and public sector companies, include the reduction in paperwork, the provision of continuous

Original Article

service availability to customers, a reduction in response time, and a reduction in error rate. All of these factors contribute to the general increase in the efficiency of government business.

E-gov encapsulates a wide variety of meanings⁵ ranging from policies that foster the development of information infrastructures to particular measures for combating the 'digital divide. It also involves a series of measures to improve the operation of the state's administrative functions. E-gov is often now seen as a synonym, or a condition for good governance,⁷ which has been linked to the presence of democratic institutions and participation of its citizens.

E-gov activities can be examined in terms of the interactions between sectors of government, business, and citizens. Though e-gov has clear benefits for businesses and government themselves, citizens actually receive the widest array of benefits from e-gov. For the citizens, e-gov can offer a huge range of information and services including information for research, government forms and services, public policy information, employment and business opportunities, voting information, tax filing, license registration or renewal, payment of fines, and submission of comments to government officials. This means that the key to making e-gov work is not technology but the citizens as there are still many people who do not or cannot access to computers and/or Internet. This is due to the gap between citizens' attributes including gender, education, income, age, households, business, and geographic areas at different socioeconomic levels with regard to both their opportunities to access information and communication technologies (ICTs) and their use of the Internet for a wide variety of activities. Of these attributes, gender and education and their impact on the use of Internet or e-gov have attracted special interest.

The Role of Automation in Trade Facilitation

Trade facilitation was included in the mandate for trade negotiations in the Doha Development Agenda in July 2004. Before this decision, some opponents of the inclusion argued that several countries lacked the necessary capacity to implement new rules on trade facilitation and that the potential costs could go beyond the means of many developing countries. This paper analyses customs automation which is one of the most powerful tools to increase customs efficiency. It focuses in particular on the benefits and implementation costs of automation. Automation is not a requirement under existing WTO disciplines and its role in relation to any future disciplines is still the subject of negotiations in Geneva.

Some countries have argued that most trade facilitation measures could be undertaken without automation while others have argued that measures related to automation would be among the most essential for ensuring a useful outcome of the negotiations. It is thus misleading to assume that all WTO members would be required to implement automation for government border procedures. This document aims to provide background information that may increase the understanding of how automation issues could be dealt with in future WTO disciplines on trade facilitation. Automation is a powerful tool to facilitate trade, but it is not an objective in itself.

Empirical Review

Chiukira (2019) carried out a study entitle: *Impact of E-Customs on Trade Facilitation: A Case Study of Developed and Developing Countries*. The study titled investigated the effects of E-Customs initiatives on trade facilitation, with a comparative analysis between developed and developing nations. The research aimed to provide insights into the broader implications of electronic customs platforms on international trade

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dynamics. The methodology employed in this study was crucial for evaluating the credibility and reliability of the findings. The researchers had used a mixed-methods approach, combining qualitative and quantitative data collection methods. The use of case studies from both developed and developing countries enhances the generalizability of the results.

The study revealed significant findings regarding the impact of E-Customs on trade facilitation. These findings encompass improvements in clearance times, reduction of administrative bottlenecks, and enhanced transparency in customs processes. Additionally, the study highlights challenges faced by developing countries in adopting E-Customs and draw comparisons with the experiences of developed nations. The findings of this study may has significant implications for policymakers, especially those in developing countries such as Nigeria. Policymakers can use the insights to tailor their strategies for E-Customs adoption, taking into account the unique challenges faced by developing economies. The study may offer practical recommendations for improving the efficiency of customs operations and fostering a more conducive environment for international trade.

By including case studies from both developed and developing countries, the study provides a comprehensive view, offering valuable insights for academics, policymakers, and practitioners interested in the intersection of technology and international trade. This research under review closely relates to the current study in the sense that both studies are focused on E-Customs. However, while the study under review focused on impact of E-Customs initiatives on trade facilitation in diverse economic contexts, the current study is focused on Enhancing customs operations through information and communication technology adoption.

Mapfumo and Mutereko (2020) carried out a study entitled: *Stakeholder Engagement in E-Government Initiatives: A Case Study of E-Customs Implementation in West Africa*. The study delved into the dynamics of stakeholder involvement in the context of implementing E-Customs initiatives. The research focused on a specific region, West Africa, and employed a qualitative case study approach to investigate the experiences, challenges, and successes in engaging various stakeholders during the implementation of E-Customs platforms. The study explored the identification and analysis of stakeholders involved in E-Customs implementation. This included customs authorities, government agencies, private sector entities, and international organizations. Understanding the diverse stakeholders is crucial for effective engagement strategies. The literature discussed the strategies employed for fostering collaboration and communication among stakeholders. Effective communication channels, engagement frameworks, and collaborative platforms were explored to ensure a cohesive approach to E-Customs implementation. The study highlighted the challenges faced in stakeholder engagement during E-Customs implementation. Additionally, it identified success factors or best practices that contribute to positive stakeholder involvement. Insights into overcoming challenges provide valuable lessons for similar initiatives. As it relates to the current research, the main gap in the literature is the limited exploration of specific stakeholder engagement dynamics in the Nigerian context. While the West Africa case study provides valuable insights, Nigeria's unique socio-economic and political landscape may introduces distinct challenges and opportunities in engaging stakeholders for E-Customs adoption.

Theoretical Framework

The researcher adopted two theories for this study, they are Diffusion of Innovation Theory and Institutional Theory

Original Article

Diffusion of Innovation Theory

Diffusion of Innovation Theory, proposed by Everett Rogers in 1962, offers a framework for understanding how innovations are adopted and diffused within a social system (Rogers, 1962). This theory posits that the adoption process follows a predictable pattern, with individuals and organizations progressing through stages of awareness, interest, evaluation, trial, and adoption (Rogers, 2003).

Rogers categorizes individuals into five groups based on their readiness to adopt innovations: innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003). This classification is relevant in the context of e-Customs initiatives in Nigeria, as it helps identify segments of customs officials and stakeholders at different stages of adoption.

The theory emphasizes the role of communication channels in the diffusion process. Different channels, such as mass media, interpersonal communication, and social networks, play varying roles in disseminating information and influencing adoption decisions (Rogers, 2003). In the context of the dissertation, understanding the most effective communication channels can inform strategies for promoting awareness and acceptance of e-Customs initiatives.

Rogers identifies five attributes that influence the rate of adoption: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003).

This theory is relevant to this study because, e-Customs initiatives in Nigeria can be analyzed based on these attributes to assess their appeal and suitability within the organizational and cultural context of customs operations.

Applying the Innovation Diffusion Theory allows for the identification of early adopters within the Nigeria customs context. These individuals or units can serve as champions for e-Customs initiatives, facilitating the diffusion process by showcasing successful implementations and influencing their peers (Rogers, 2003).

The theory provides a framework for assessing the overall adoption rates of e-Customs initiatives in Nigeria. By understanding the distribution of adopter categories, policymakers and implementers can tailor strategies to address the specific needs and concerns of each group, thereby enhancing the overall adoption process (Rogers, 2003).

Recognizing the significance of communication channels, the theory suggests tailoring communication strategies to effectively disseminate information about e-Customs initiatives. Whether through formal training programs, peer networks, or targeted media campaigns, understanding the preferred channels of communication can enhance awareness and acceptance (Rogers, 2003).

Innovation Diffusion Theory provides a valuable lens for understanding the dynamics of adopting e-Customs initiatives in Nigeria. By considering the stages of adoption, adopter categories, and attributes of innovations, this theory offers insights that can inform strategies to promote the successful integration of information and communication technologies into customs operations.

Institutional Theory

Institutional Theory, developed in organizational sociology and economics, explores how institutions (rules, norms, and values) shape and influence the behavior and decisions of organizations within a given social context (DiMaggio & Powell, 1983). Applied to the context of e-Customs initiatives in Nigeria, Institutional

Original Article

Theory provides insights into the external pressures and influences that affect the adoption and implementation of information and communication technologies (ICT) in customs operations.

Institutional Theory introduces the concept of isomorphism, which describes the tendency of organizations to conform to the prevailing institutional environment to gain legitimacy and reduce uncertainty (DiMaggio & Powell, 1983). There are three types of isomorphism: coercive, mimetic, and normative.

Coercive isomorphism results from external pressures exerted by formal authorities or regulatory bodies. Organizations, including customs agencies, may adopt e-Customs initiatives to comply with national laws, international standards, or mandates from supranational organizations, such as the World Customs Organization (WCO) (Meyer & Rowan, 1977).

Mimetic isomorphism occurs when organizations imitate the practices of others, especially those perceived as successful or legitimate. Customs agencies in Nigeria may be influenced by the practices of other nations that have successfully implemented e-Customs solutions, leading to a desire for legitimacy and improved efficiency (DiMaggio & Powell, 1983).

Normative isomorphism involves organizations conforming to professional or industry norms. Customs operations globally may be influenced by shared beliefs and values regarding the benefits of adopting e-Customs technologies for trade facilitation, security, and transparency (DiMaggio & Powell, 1983).

Institutional Theory helps in understanding how the legal and regulatory environment in Nigeria influences the adoption of e-Customs initiatives. Customs agencies may be compelled to adopt ICT solutions to align with national laws and international standards, ensuring compliance and avoiding legal sanctions (Meyer & Rowan, 1977).

The theory provides insights into how customs agencies in Nigeria may emulate global best practices in e-Customs implementation. Mimetic isomorphism suggests that customs officials may look to successful cases in other countries as benchmarks for legitimacy and efficiency, fostering a desire to replicate these practices locally (DiMaggio & Powell, 1983).

The influence of professional networks and normative isomorphism is evident in the shared beliefs and values within the global customs community. Customs officials in Nigeria may be motivated to adopt e-Customs initiatives to align with international norms and to be perceived as part of a community dedicated to advancing trade facilitation through technological advancements (DiMaggio & Powell, 1983).

Institutional Theory provides a valuable lens for understanding the external pressures and influences that shape the adoption of e-Customs initiatives in Nigeria. By considering coercive, mimetic, and normative isomorphism, the theory contributes to a comprehensive understanding of how institutional factors impact the decisions and behaviors of customs agencies within the broader social context.

Methodology

The study adopted survey research design. The population of the study comprises various stakeholders directly involved in customs operations and the implementation of E-Customs initiatives in Nigeria. This includes customs officials from different sectors in Nigeria who according to the Permanent Secretary, Ministry of Finance, have a population of about 19,300 officers and men, 2 government stakeholders from Ministry of Interior, 2 Clearing and Forwarding agents in Apapa, 2 Business people engaged in international trade, and 2 technology experts. Therefore, the total population for this study will be 9,308. From all the clusters mentioned.

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Taro Yamane sample size determination formula was used to arrive at a sample size of 400. Purposive sampling technique was used to administered the instrument to the respondents. Weighted Mean Score (Four Point Likert Scale) was used to analyses the data. The score of 2.5 was used as the criterion for discussion. A response which is equal to or more than 2.5 is positive, i..e the respondents agree with the item while any mean response less than 2.5 was negative.

Table 1: E-customs Initiatives Adopted by the Nigeria Customs Service.

Items	SA (4)	A (3)	D (2)	SD (1)	Total	WMS	Decision
Nigeria Integrated Customs Information System (NICIS) has improved customs processes.	154	175	45	10	384	3.23	Agree
Pre-Arrival Assessment Report (PAAR) has streamlined goods assessment.	160	170	40	14	384	3.24	Agree
Automated System for Customs Data (ASYCUDA) improved efficiency.	145	190	30	19	384	3.19	Agree
The e-Customs initiatives have reduced clearance time at ports.	130	200	35	19	384	3.15	Agree

Table 2: Challenges hindering effective utilization of e-customs initiatives in the Nigeria Customs Service?

Items	SA (4)	A (3)	D (2)	SD (1)	Total	WMS	Decision
Lack of reliable infrastructure hinders ICT adoption.	180	150	45	9	384	3.30	Agree
Staff training is inadequate for ICT system use.	160	165	48	11	384	3.23	Agree
Resistance to change among staff slows ICT adoption.	140	175	50	19	384	3.13	Agree
Limited funding affects ICT system implementation.	170	160	40	14	384	3.26	Agree

Table 4.3: Strategies by the NCS to enhance effective adoption of e-customs initiatives for efficient service delivery?

Items	SA (4)	A (3)	D (2)	SD (1)	Total	WMS	Decision
Regular staff training is provided to enhance ICT skills.	170	165	35	14	384	3.26	Agree
Collaborations with private sector for	160	160	50	14	384	3.21	Agree

Original Article

Items	SA (4)	A (3)	D (2)	SD (1)	Total	WMS	Decision
better infrastructure are in place.							
The Customs Service regularly upgrades ICT systems.	165	150	55	14	384	3.21	Agree
Contingency plans are set for manual operations during ICT downtimes.	170	165	35	14	384	3.26	Agree

Research Question 1: What specific e-customs initiatives are adopted by the Nigerian Customs Service?

The findings of the study revealed that the integration of ICT into customs operations has been aimed at improving efficiency, transparency, and reducing clearance time for goods, as highlighted in both quantitative and qualitative data. The study is in agreement with the principles of Diffusion of Innovation theory which states that the adoption process follows a predictable pattern, with individuals and organizations progressing through stages of awareness, interest, evaluation, trial, and adoption. The study corroborate with the earlier studies in carried out by Chiukira (2019) whose study revealed that encompass improvements in clearance times, reduction of administrative bottlenecks, and enhanced transparency in customs processes.

Research Question 2: Research Question 2: What are the challenges hindering effective utilization of e-customs initiatives in the Nigerian Customs Service?

The findings of the study revealed the challenges encompass infrastructural issues, personnel-related constraints, and organizational factors that hinder the full potential of ICT solutions in customs operations. One of the most prominent challenges identified through both the Likert scale data and interviews is the inadequacy of infrastructure. The finding of this study is agreement with the principles Institutional Theory which states that the influence of professional networks and normative isomorphism is evident in the shared beliefs and values within the global customs community. Customs officials in Nigeria may be motivated to adopt e-Customs initiatives to align with international norms and to be perceived as part of a community dedicated to advancing trade facilitation through technological advancements. The findings of the study corroborate with the earlier studies in carried out by Mapfumo & Mutereko (2020) whose study revealed that stakeholders involved in E-Customs implementation. This included customs authorities, government agencies, private sector entities, and international organizations.

Research Question 3: What strategies are put in place by the NCS to enhance effective adoption of e-customs initiatives for efficient service delivery?

Findings of the study revealed that the efforts range from staff training programs to collaborations with technology partners, demonstrating a commitment to leveraging technology for efficient customs operations. The finding of this study is agreement with the principles Institutional Theory which states that the concept of isomorphism, which describes the tendency of organizations to conform to the prevailing institutional environment to gain legitimacy and reduce uncertainty. The findings of the study corroborate with the earlier studies in carried out by Mapfumo & Mutereko (2020) whose study revealed that the strategies employed for fostering collaboration and communication among stakeholders. Effective communication channels, engagement frameworks, and collaborative platforms were explored to ensure a cohesive approach to E-Customs implementation.

Original Article

Conclusion

The need to enhance customs operations through ICT adoption is imperative for fostering efficient, transparent, and secure international trade. This study provided a nuanced understanding of the factors influencing the successful integration of e-customs initiatives in customs operations in Nigeria, ultimately offering insights that can inform policy decisions and practical implementations.

The study has provided an in-depth exploration of the role of ICT especially e-Customs initiatives in enhancing customs operations within the Nigeria Customs Service (NCS) and their impact on service delivery and trade facilitation. The findings demonstrate that the implementation of ICT systems such as NICIS, ASYCUDA, and e-payment platforms have improved operational efficiency, reduced paperwork, and streamlined customs processes. However, the adoption and utilization of these technologies are still hindered by several challenges, including infrastructural limitations, resistance to change, and insufficient staff training.

Recommendations

Based on the findings, the study recommends that: To further leverage on e-customs initiatives and ICT, the NCS should ensure continuous system updates and regular maintenance to prevent technical glitches and optimize system performance. Additionally, integrating these systems with other governmental and international trade platforms can enhance interoperability and streamline customs operations.

1. The NCS should prioritize investment in staff training and foster a culture that embraces change through awareness and incentive programmes
2. To build on the existing strategies, NCS should continue to expand partnerships with cutting edge technology providers, ensuring they have access to the latest advancement in ICT

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Original Article

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