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Effect of Staff Digital Literacy on Customs Goods Clearance at Jomo Kenyatta International Airport, Kenya

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Abstract

Purpose: The clearance of imported goods at airports used the risk-based management customs systems of clearance to enhance faster clearance of goods from air cargo complexes, the use of Electronic Data Interchange (EDI), there was quick cargo clearance of perishable cargo, and uniform and simple procedure of cargo handling. There were e-payment systems that enhanced faster clearances with an overall aim of minimizing dwell time of cargo to be handled at the airport's storage complexes. The purpose of the study was to determine the effect of staff digital literacy on customs goods clearance at Jomo Kenyatta International Airport, Kenya.

Methodology: This study employed an explanatory research design. The target population of the study was 245 KRA employees. Data was collected using questionnaires. The data were coded and entered into the Statistical Package for Social Sciences (SPSS). Collected data was analyzed using descriptive and inferential statistics.

Results: The findings showed that staff digital literacy had a positive and significant effect on customs goods clearance (β=0.485, p=0.000).

Conclusion: KRA needs to engage its staff in digital literacy training. Furthermore, gaining digital literacy skills helps staff to make use of all that technology has to offer in terms of learning, creativity, and teamwork, which enhances their custom goods clearances even more.

Keywords: *Staff digital literacy, customs goods clearance, Jomo Kenyatta International Airport*

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1.0 Introduction

The clearance of imported goods at airports used the risk-based management customs systems of clearance to enhance faster clearance of goods from air cargo complexes, the use of Electronic Data Interchange (EDI), there was quick cargo clearance of perishable cargo, and uniform and simple procedure of cargo handling. There were e-payment systems that enhanced faster clearances with an overall aim of minimizing dwell time of cargo to be handled at the airport's storage complexes. There is examination of imported goods using non-intrusive inspection that is the use of scanners and the use of conveyor belts in cargo offloading which aid faster cargo handling hence, facilitate faster cargo clearance. Clearance of imported goods at airports is one of the major tasks performed by different stakeholders to make it a success.

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The delays at border crossings and ports caused by lengthy, complex procedures and excessive paperwork have created a negative impact on trade and increased cost of doing business in the country. The Customs and Border Control Department ensures that imports, exports, and declarations of transit are processed. It is also in charge of assessing the origin and value of goods as well as the classes into which goods are categorized. The customs and Border Services department also ensures that duties and fees are collected and processed and that cargo is physically inspected.

The Department is quite significant and has implications for trade facilitation, operational efficiency, and economic growth in Kenya. This research study aims to investigate how information technology integration has transformed customs operations at the airport and identify the key challenges and opportunities associated with its implementation. It is quite important to note that information technology integration has fundamentally transformed customs operations at airports worldwide, making them more efficient, secure, and transparent. These advancements not only benefit customs authorities but also contribute to the seamless movement of goods and people across borders, promoting global trade and economic development. The significance of IT integration in customs operations includes increased efficiency, enhanced security, improved risk management, streamlined processes, and better data analysis. Various airports around the world have adopted information technology in their customs operations. For instance, the Singapore Changi Airport has implemented the Trade Net system, an integrated IT platform that allows for seamless electronic submission and processing of trade declarations, enabling efficient and rapid customs clearance (Intal Jr et al., 2021).

Customs controls for generation of revenue, interests of domestic economies, and for purposes of national security have been put in place by countries across the world; Kenya included. Countries have some specific local requirements within their localities but similarities such as the universal need for documentation for shipment purposes, which include commercial invoices and bills of lading, still exist (McLinden, 2015). For efficient operations and clearance of goods at JKA that is smooth and reliable, Kenya Ports Authority (KPA) works hand in with the Kenya Revenue Authority (KRA). Customs clearance refers to the duties that a national customs authority, such as KRA undertakes.

It is quite important to note that effective digital literacy by staff plays a crucial role in leveraging technology to enhance operational efficiency, accuracy, and overall performance within the department. Various studies have shown that competent digital systems management ensures that the customs departments have a robust and optimized IT infrastructure in place (Nderitu, 2020). In some countries, customs administrations have implemented ICT for several years but did so in a perfunctory manner that did not derive much real benefit. There is a need for mitigation measures to identify the cost incurred by continuing the obsolete business process, conduct business process reengineering, and ensure effective change management among customs managers and staff. These mitigation measures may add more time and delay in ICT implementation but are worth to reduce conflict costs and maximize benefits of ICT use in the future (Tadatsugu Matsudaira & Jonathan Koh, 2022).

1.1 Problem Statement

Air cargo clearance ports in Africa often face inefficiency in customs operations which also has a negative impact on Africa's global trade performance. The bottlenecks result in delays, long transit times, congestion and illicit trade. Despite efforts to improve Africa's trade competitiveness and the continent's participation in the global trade system, the continent is

still a peripheral player owing to these and other challenges. Central to resolving the continent's trade challenges is the need to improve customs performance, which is a key factor in determining trade efficiency (Lowitt, 2017).

However, in Kenya, cargo clearance procedures are one of the major bottlenecks in product supply chains (Chinedum, 2018). The delays at border crossings and ports caused by lengthy, complex procedures and excessive paperwork have created a negative impact on trade and increased cost of doing business in the country.

These challenges have led to in-efficient processes which have caused delays in cargo clearance thus affecting port operations and overall cost of doing business in the country (Stephen, 2022). The challenges experienced have also affected trade across borders in Kenya with key stakeholders raising concerns due to frequent disruption of their business, as a result of delays in cargo clearance at various ports (Kabui, 2018). The delays have increased the cost of clearing cargo and at the long increased the prices of imported goods into the country.

A study by Odago (2021) on the impact of adoption of an Electronic Cargo Tracking System. (ECTS) on excise revenue collection at Jomo Kenyatta International Airport found that the adoption of information technology with regard to Electronic Cargo Tracking System (ECTS) has had a positive impact on customs performance in Kenya as it has increased excise revenue from Sh. 80 billion in 2010 to Sh. 165 billion in 2018. Omosa (2021) focused on effect of systems automation on customs revenue performance in Kenya. The study's dependent variable is customs revenue performance thus showing a conceptual gap. Nganda (2021) focused on effect of system automation on customs performance at the Port of Mombasa in Kenya. The study was done in Port of Mombasa thus showing a contextual gap. The study therefore sought to assess the effect of staff digital literacy on customs goods clearance at Jomo Kenyatta International Airport, Kenya.

1.2 Research Hypothesis

H_0: There is no significant effect of staff digital literacy on customs goods clearance at Jomo Kenyatta International Airport, Kenya

2.0 Literature Review

2.1 The Concept of Staff Digital Literacy

It is quite important to note that effective digital literacy by staff plays a crucial role in leveraging technology to enhance operational efficiency, accuracy, and overall performance within the department. Various studies have shown that competent digital systems management ensures that the customs departments have a robust and optimized IT infrastructure in place (Nderitu, 2020). In some countries, customs administrations have implemented ICT for several years but did so in a perfunctory manner that did not derive much real benefit. There is a need for mitigation measures to identify the cost incurred by continuing the obsolete business process, conduct business process reengineering, and ensure effective change management among customs managers and staff. These mitigation measures may add more time and delay in ICT implementation but are worth to reduce conflict costs and maximize benefits of ICT use in the future (Tadatsugu Matsudaira & Jonathan Koh, 2022).

IT capabilities at the JKIA`s cargo services department have greatly enabled real-time tracking and monitoring of cargo shipments (Odago, 2021). This has also enhanced visibility into the movement of goods, ensuring timely interventions and reducing the risk of cargo delays or losses. This visibility is essential for efficient planning, resource allocation, and timely

decision-making. Similarly, with real-time tracking, it becomes easier to monitor cargo throughout its entire journey.

This reduces the risk of theft, pilferage, or unauthorized access to the cargo during transit, thus enhancing overall security (Odago, 2021). This implies that if any issues or delays occur during transit, real-time tracking enables prompt identification of the problem. The KRA customs officials then take immediate action to resolve the issue, avoiding further delays or potential compliance problems.

2.2 The Concept of Customs Goods Clearance

The import and export trade is fundamental in facilitation of Kenya's global integration. However, inefficiencies in clearance procedures at JKIA border and high costs for transport on sea are great obstacles to efficient international trade. In Kenya, the collection of duties and taxes at the JKIA Entry t is a very essential contributor to the state revenues (KPA, 2015). To enhance revenue collection, it is fundamental to monitor the efficiency of customs administration at the JKIA. It is now increasingly known that the time efficiency in customs clearance is essential in facilitating trade globally.

Theoretically, the time for performance of formalities of import clearance begins long before cargo arrival. It is not strictly related to dwell time for cargo (KPA, 2015). At JKIA, like in many countries that are developing, a lot of formalities are still performed after the arrival of despite initiatives for facilitation of trade being put in place (UNCTAD, 2013). There is a close relationship between customs clearance and cargo dwell time for cargo. Delays largely, but not solely, occur during customs clearance. Customs clearance is usually managed efficiently by shippers as well as clearing and forwarding agents during some other operations, hence transactional dwell time for transactions does not significantly contribute to overall dwell time (UNCTAD, 2013).

It has been noted by other parties that missing documentation, declaration errors, or just lack of anticipation leads to loss of time during clearance at JKIA. Moreover, apart from administration of customs, there are several other players managing formalities at JKIA. However, for dwell time, processes involved in customs clearance mark the start and the end of majority of procedures (UNCTAD, 2013). Regulations regarding security and customs can lead to great delays in terminal operations. Therefore, it is important there is negotiation with the responsible agencies and that management of the terminal incorporates security practices, especially for logistics related to containers (Acciaro & Serra, 2013). However, major issues still abound regarding the impact of procedures for scanning and custom clearance as well as the ISPS code (Bakshi, Flynn & Gans, 2011).

2.3 Staff Digital Literacy and Customs Goods Clearance

A study by Odago (2021) on the impact of adoption of an Electronic Cargo Tracking System. (ECTS) on excise revenue collection at Jomo Kenyatta International Airport found that the adoption of information technology with regard to Electronic Cargo Tracking System (ECTS) has had a positive impact on customs performance in Kenya as it has increased excise revenue from Sh. 80 billion in 2010 to Sh. 165 billion in 2018. The study was significant since its findings influenced excise revenue collection.

Data analytics is an important aspect within the KRA Customs at the JKIA`s cargo services department (Odago, 2021). Statistics have shown that the IT management at the KRA Customs within the JKIA`s cargo clearance department has been able to leverage data analytics tools to extract valuable insights from the vast amount of data generated by cargo operations. These

insights have been crucial in informing decision-making, helping identify bottlenecks, and enabling proactive measures to improve performance. This study therefore sought to determine the effect of staff digital literacy on customs goods clearance at JKIA.

Falloon (2020) focused on digital literacy to digital competence: the teacher digital competency (TDC) framework. This article presents a conceptual framework introducing an expanded view of teacher digital competence (TDC). It moves beyond prevailing technical and literary conceptualizations, arguing for more holistic and broader-based understandings that recognise the increasingly complex knowledge and skills young people need to function ethically, safely, and productively in diverse, digitally-mediated environments.

Rakib, Azis, Najib and Isma (2024) focused on impact of digital literacy, business innovation, and competitive advantage on the existence of SMEs: A quantitative study in Makassar City, Indonesia. This study used a quantitative approach. The results show that digital literacy and innovation have a significant effect on competitive advantage and business existence as well as digital literacy and business innovation significant effect on the existence of SMEs through competitive advantage.

Marsh (2021) focused on understanding the effect of digital literacy on employees' digital workplace continuance intentions and individual performance. Linear regression was used to analyse the conceptual model using survey data from 142 employees of a major UK charitable organisation. Results partially supported the model, demonstrating that employees' digital skills affect continuance intentions and individual performance via their perceptions of ease of use.

3.0 Methodology

The study adopted an explanatory research design. The design was applied in the study as it is not restricted to fact-findings only but used in formulation of important principles of knowledge and solutions to significant problems (Daniel, 1996). The target population of the study was 245 comprised of 51 Customs officers, 24 Customs supervisors, 19 Customs managers, 48 IT support staff, 46 customs clearance Agent, and 57 Customs Data analytics. The study adopted a stratified sampling technique. The population was divided into different strata. The respondents were chosen randomly within different strata to give all subsets of the frame an equal probability. Data collection instrument for the study was questionnaires. Data was analyzed using descriptive and inferential statistics. Inferential statistics are used apart from descriptive statistics and thematic analysis. This included correlation analysis and regression analysis. The study used regression model analysis to determine the relationship between independent and dependent variables.

4.0 Results and Discussion

4.1 Descriptive Analysis for Staff Digital Literacy

Descriptive analysis results for staff digital literacy are presented in Table 1.

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Table 1: Descriptive Analysis of Staff Digital Literacy

Statement	Strongly Disagree	Disagree	undecided	Agree	Strongly Agree	Mean	Std. dev
The staff numbers are enough to handle goods clearance at the border	10.10%	11.80%	16.80%	38.70%	22.70%	3.52	1.25
The staff understand the general use of computers and electronic systems to perform their work	5.00%	7.60%	3.40%	37.00%	47.10%	4.13	1.12
There is staff rotation at the border hence improving the skills	8.40%	10.90%	5.00%	32.80%	42.90%	3.91	1.3
The staff are experienced in the work	5.00%	5.90%	5.90%	41.20%	42.00%	4.09	1.08
There is job training for staff	1.70%	4.20%	2.50%	49.60%	42.00%	4.26	0.84

The study showed that majority of the respondents who were 61.40% agreed with the statement that the staff numbers are enough to handle goods clearance at the border (mean=3.52, std.dev=1.22). This denotes that KRA has enough staff to handle the clearance of goods. Further results showed that majority of the respondents who were 84.1% agreed with the statement that the staff understand the general use of computers and electronic systems to perform their work (mean=4.13, std.dev=1.12). This denotes that KRA staff are well trained on use of computers.

The results also showed that majority of the respondents who were 75.7% agreed with the statement that there is staff rotation at the boarder hence improving the skills (mean=3.91, std.dev=1.30). This denotes that KRA does staff rotation which helps in improving the staff skills. Further results showed that majority of the respondents who were 83.2% agreed with the statement that the staff are experienced in the work (mean=4.09, std.dev=1.08). This denotes that KRA staffs are well experienced. The results also showed that majority of the respondents who were 91.6% agreed with the statement that there is on job training for staff (mean=4.26, std.dev=0.84). This denotes that KRA conducts training for their workers.

4.2 Descriptive Analysis for Customs Goods Clearance

Descriptive analysis results for customs goods clearance are presented in Table 2.

Table 2: Descriptive Analysis for Customs Goods Clearance

Statement	Strongly Disagree	Disagree	undecided	Agree	Strongly Agree	Mean	Std. dev
Clearance time has been reduced hence facilitating trade	8.40%	8.40%	13.40%	26.10%	43.70%	3.88	1.29
Online declaration has enhanced easy declaration of large volumes of cargo	9.20%	10.10%	16.00%	23.50%	41.20%	3.77	1.33
The number of goods cleared per day has increased	6.70%	6.70%	18.50%	23.50%	44.50%	3.92	1.23
The cost of clearing goods had reduced	15.10%	15.10%	24.40%	17.60%	27.70%	3.28	1.41

The results showed that majority of the respondents who were 69.8% agreed with the statement that clearance time has been reduced hence facilitating trade (mean=3.88, std.dev=1.29). This

infers that KRA customs department at JKIA has been able to minimize clearance time which has made trading effective.

The results showed that majority of the respondents who were 64.7% agreed with the statement that online declaration has enhanced easy declaration of large volumes of cargo (mean=3.88, std.dev=1.29). This infers that KRA customs department at JKIA has embraced online declaration.

Further results showed that majority of the respondents who were 68.0% agreed with the statement that the number of goods cleared per day has increased (mean=3.92, std.dev=1.23). This infers that KRA customs department at JKIA have managed to increase the number of goods cleared per day. The results showed that majority of the respondents who were 43.5% agreed with the statement that cost of clearing goods had reduced (mean=3.28, std.dev=1.41). This denotes that KRA customs department at JKIA have managed to minimize the cost of clearing goods.

4.3 Correlation Analysis

Correlation analysis was conducted to determine the association between staff digital literacy and customs goods clearance. This is presented in Table 3.

Table 3: Correlation Analysis

		Custom Goods Clearance	Staff Digital Literacy
Custom Goods Clearance	Pearson Correlation	1	
Staff Digital Literacy	Pearson Correlation	.785**	1

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

The findings indicate that staff digital literacy had a positive and significant relationship with custom goods clearance (r=0.785, p=0.000). This infers that staff digital literacy has a strong positive and significant association with custom goods clearance.

4.4 Regression Analysis

Regression analysis was conducted to determine the effect of staff digital literacy on customs goods clearance at Jomo Kenyatta International Airport, Kenya.

Table 4: Regression of Coefficient

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.129	0.236		-0.547	0.585
Staff Digital Literacy	0.520	0.073	0.485	7.078	0.000

The results revealed that staff digital literacy had a positive and significant effect on customs goods clearance (β=0.485, p=0.000). The null hypothesis (H_0) was that staff digital literacy has no effect on customs goods clearance at Jomo Kenyatta International Airport, Kenya. Results showed that the t calculated of staff digital literacy was 7.078 which was greater than t critical (1.96). Therefore, null hypothesis was rejected and the study concluded that there was a

statistically significant relationship between staff digital literacy and customs goods clearance at Jomo Kenyatta International Airport, Kenya.

4.5 Discussion

Correlation results showed that staff digital literacy has a moderately strong positive and significant association with custom goods clearance. In addition, regression results showed that staff digital literacy had a positive and significant effect on customs goods clearance (β=0.485, p=0.000). This infers that an improvement in staff digital literacy by one unit would improve efficiency of goods clearance at one post by 0.485 units. The study findings agreed with Odago (2021) who found that the adoption of information technology with regard to Electronic Cargo Tracking System (ECTS) has had a positive impact on customs performance in Kenya. The study findings also agreed with Rakib, Azis, Najib and Isma (2024) who found that digital literacy and innovation have a significant effect on competitive advantage and business existence as well as digital literacy and business innovation significant effect on the existence of SMEs through competitive advantage.

5.0 Conclusion

The study concluded that staff digital literacy had a positive and significant effect on customs goods clearance at Jomo Kenyatta International Airport, Kenya. In KRA, personnel with low digital literacy skills should be identified and in-service training should be provided. This will enhance customs goods clearance at JKIA.

6.0 Recommendations

KRA needs to engage its staff in digital literacy training. Furthermore, gaining digital literacy skills helps staff to make use of all that technology has to offer in terms of learning, creativity, and teamwork, which enhances their custom goods clearances even more.

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