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ABSTRACT

System automation is usually applied to improve customs performance. System automation plays a significant role in simplifying and harmonizing border and administrative procedures. It leads to enhanced efficiency and effectiveness in the customs system. This study sought to establish Effect of automation of customs release process on customsperformance at the port of Mombasa in Kenya. This study was founded on the unified theory of rational expectations theory of technology adoption. The study's target population constituted of 1500 Clearing Agents. The sample size of 306 was determined using Yamane formula. Simple random sampling was adopted to select respondents from the population. The main data collection instrument adopted for this study was the questionnaire which was self-administered to the respondents. The study found out that that enhancing automation of customs verification leads to enhancement of customs performance ($\beta_2 = 0.313$; $p < 0.05$). It was also concluded that improving system automation will lead to improved customs performance at the port of Mombasa in Kenya. It was recommended that all systems between the Partner Government Agencies which include the Kenya Revenue Authority should be interconnected to improve Customs performance at the Port of Mombasa.

Key Words: *Automation, Custom Release Process*

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INTRODUCTION

Approaches based on system automation are fundamental in achievement of tax administration efficiency (UNCTAD, 2006). Based on experiences in Ghana, Morocco, Philippines and Uganda, it is evident that computerization of customs procedures, such as Uganda's Automated System for Customs Data (ASYCUDA) in Uganda and Ghana's Trade Net, leads to improvement in revenue collection (Salehi, 2012). Between 1998 and 2002, customs revenue in Morocco increased by about 7.7%. This was attributed to increase in commercial activities and improvement in quality of declarations, increase in productivity of customs and controls that are quality (Salehi, 2012).

The application of an updated version of ASYCUDA in Benin, Botswana, Cameroon, Tanzania and Zambia was aimed at enabling importers to lodge declarations from where they are based in and limiting the piling of documents. It enabled traders to make direct inputs. In EAC, ASYCUDA and RADDEX aimed at reducing cargo clearance times and costs amongst EAC countries through provision of an information bridge that is secure and can be accessed readily by clients who are approved (USAID, 2012). Export and re-export information as well as cleared transit declarations and reconciliation of data from cargo accepted in the country of intended destination are usually conveyed through RADDE (USAID, 2012).

The CBCD discarded the semi-automated system-Boffin and implemented a web- based application-Simba 2005 System (Tradex) (KRA, 2017). The KRA document processing centre (DPC) replaced the traditional long rooms throughout Kenya. The DPC processes and validates documents online. Export or import cargo documentation, customs release and payment processes are now automated (KRA, 2017).

The registered entries are then processed electronically by customs officers, after which a DPC approval is issued. Making payments has also been automated in KRA customs services. Charges at the port of Mombasa are usually paid through deduction of the running accounts of clearing agents. Electronic supporting documents for payments are processed online as the KRA and bank systems are interlinked. Payments made online are secure owing to the use of passwords (Aeromarine CapitalGroup Kenya, 2018).

Performance refers to level of success achieved in an organization (Sulaiman, Yusoff, & Chelliah, 2010). According to Devinney, Yip and Johnson (2010), at least three dimensions can be used to characterize the basic aspects of customs performance. The qualitative approach of measuring performance using a Likert scale is widely used by researchers (Zehira & Yavuz, 2014). Most firms are not willing to provide critical data, such as financial data, hence performance measurement based on subjective approach is usually generally adopted by researchers (Esteve, Peinado, & Peinado, 2008). Four high level outcomes that can be used to measure customs performance are time, cost, simplification and risk Willis, Homel & Anderson, 2010).

The costs of trade and customs document processing, duration taken in approval of documents, staff requirements in processing and handling documentation and customs services, time for clearance of cargo clearance and the amounts of stock carried by enterprises are useful indicators of performance in customs (Matsumoto & Lee, 2007). Transparency as an indicator of customs performance is relevant to both businesses and the government hence it is considered as a high level performance outcome (Holloway, 2010). Customs performance can be measured by reduction of clearance time and costs (Wei, 2013).

Customs performance at the port of Mombasa has not been satisfactory. Various instances of inefficiency have been reported. The cost of business transactions within the port of Mombasa has more than doubled due to imposition of non-tariff barriers and other complex procedures of customs administration (Mghenyi, 2017). KRA

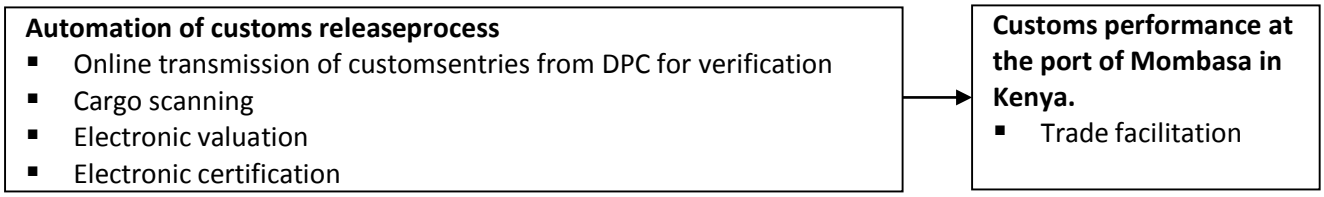
officers no longer facilitate trade. Ineffective KRA officers have led to incurrence of extra storage costs. Importers incur an unprecedented extra Sh10 million each day due to payment for cargo storage charges and extra taxes owing to the imposed non-tariff barriers (Mghenyi, 2017). Delay in container cargo clearance at the port of Mombasa is hindering trade. Clearance period is usually long and containers overstay at the port for more than 10 to 12 days (Milimu, 2015).

LITERATURE REVIEW

Rational Expectations Theory of Technology Adoption

In 1989, Davis developed this theory. According to the rational expectations theory of technology adoption, much of the decisions on adoption of technology depend on the expectations of the firm expectations about its costs and benefits (Gutierrez, 2006; Au, Kauffman & Riggins, 2006). The theory is applied in examining settings of technology adoption where various parties want to align their future value expectations before making technology adoption decisions. The theory accounts for the learning and sharing of information that generally occurs between various parties in the market place and can influence clustered adoption and the overall rate of technology adoption (Au, Kauffman & Riggins, 2006).

In technology adoption issues arise in management of expenditure. The resource allocation and assurance of economic, efficient and effective undertaking of tasks needed to achieve the objectives of technology adoption should be ensured (Hollingum, 2006). The expenditure policy put in place must take into account the costs of transactions, bargaining and decisions related to adoption of technology (Rabin & Mathew, 1998). Applying the theory to the study, it is implied that the expected costs and benefits of using IT in cargo documentation, customs release process and customs payment such as sharing of information electronically influence the use of technology. This theory was the basis of conceptualizing that automation of cargo documentation, automation of customs release and automation of payment system affects customs performance at the port of Mombasa in Kenya.



Independent variable **Dependent variable**

Figure 1: Conceptual Framework

Empirical Review

The studies reviewed were conducted in various countries of the world. Cantens, Raballand and Bilangna (2010) conducted a study on reforming customs through performance measurement in Cameroon. It was noted that there was significant reduction in corruption and clearance times significantly reduced, four months after installation of the Automated System for Customs Data (ASYCUDA). However, this study did not focus on the effect of system automation on customs performance measured by total costs for import- and export-related transactions, simplification of clearance process and identification and interdiction ofcargo of high risk.

James (2010) examined the impact that automation has on KRA customs clearing procedures in Kenya. It was established that the customs department reported improvement in efficiency, effectiveness, staff skills and governance as well as cost reduction

due to the use of the Trade X-Simba system. However, this study did not focus on the effect of system automation on customs performance measured by port clearance time, transparency, simplification of clearance process and identification and interdiction of high-risk cargo. Serete (2015) examined the factors that affect clearance of containerized cargo at KPA. The study found out that there is a strong positive relationship between documentation process and clearance of container cargo at KPA. It was noted that the Single Window system curbs congestion at KPA.However, this study did not focus on the effect of system automation on customs performance measured by total costs for importation and exportation transactions, transparency, simplification of the process of clearing cargo and identification and interdiction of cargo of high risk.

Akbay (2009) studied computerization of foreign trade transaction in Turkey. It was noted that to enhance efficiency, the Turkish Customs Administration (TCA)

initiated their electronic lodgment of cargo documentation program on November 2, 1999. It was established that upon implementation of the program, clearance times reduced significantly. The researcher noted that it was a clear sign that the reform eased the burden on traders between 1996-2000. However, this study did not focus on the effect of automation of cargo documentation on customs performance measured by total costs for import- and export-related transactions, transparency, simplification of clearance process and identification and interdiction of high-risk cargo.

Cheruiyot (2015) studied I-tax system and service delivery by Kenya Revenue Authority in Nairobi stations. It was noted that the perceptions of employees about technology significantly influences delivery of services to customers. It was also determined that the delivery of services to customers is improved significantly when users understand and have knowledge of the system of taxation and internet access. However, this study did not focus on the effect of automation of payment system on customs performance measured by port clearance time, total costs for import- and export-related transactions, transparency, simplification of clearance process and identification and interdiction of high-risk cargo.

Alcedo and Cajala (2015) examined the present computerization program of the bureau of customs (BOC) in Philippines, focusing on import and export transactions. It was noted that there was unanimous agreement among respondents that that the perceived benefits of the BOC computerization program were attained. However, corruption was fairly eliminated. It was noted that respondents unanimously agreed that the computerization of the BOC was effective. The study also found out that import/export documentation was fairly effective. However, this study did not focus on the effect of automation of customs release process on customs performance.

Wondemagegne (2014) examined customs and revenue reforms in Ethiopia in the case of ASYCUDA++. It was noted that the adoption of ASYCUDA by Ethiopia Revenue Collection Authority (ERCA) led to simplification of the functions of the ERCA. However, this study did not focus on the effect of automation of customs release process on customs performance measured by port clearance time, total costs for import- and export-related transactions, transparency and identification and interdiction of high-risk cargo. Zhou and Madhikeni (2013) examined systems, processes and challenges of public revenue collection in Zimbabwe. It was established that electronic revenue systems increases business efficiency hence resulting in improvements in revenue collection. However, this study did not focus on the effect of automation of payment system on customs performance measured by port clearance time, total costs for import- and export-related transactions, transparency, simplification of clearance process and identification and interdiction of high-risk cargo.

METHODOLOGY

Descriptive survey research design was used in the study. Descriptive research enables the determination, description and reporting of the actual state of behaviours, attitudes, values and characteristics among others. Descriptive research can be conducted easily and is simple (Mugenda, 2013). The sample size comprised of 204 respondents selected through simple random sampling. Regression analysis was used to explain the effect of the independent variables on the dependent variable. The regression model adopted was as follows:

$\mathbf{Y} = \beta_0 + \beta_1\mathbf{X_1} + \varepsilon$

Whereby; **Y** represents customs performance at the port of Mombasa in Kenya

β0 represents the y-intercept

β1, β2 and β3 represent coefficients of automation of cargo documentation, automation of customs release process and automation of payment system respectively

X1 represent the independent variables

ε represent error term

FINDINGS

Automation of Customs Release Process

As shown in Table 1, the study examined the opinions of the respondents on automation of customs release process.

Table 1: Descriptive Statistics for Automation of Customs Release Process

	N	Mean	Std. Dev
The transmission of customs entries online from DPC for verification is fast	151	3.69	0.971
The process of scanning cargo is efficient	151	3.84	1.137
Valuation of cargo with the aid of the electronic systems is fast and convenient	151	3.70	1.040
After export confirmation, the electronic issue of certificate of export is fast and convenient	151	3.84	1.016

The findings indicated that there was general agreement that the process of scanning cargo is efficient (mean = 3.84; std dev = 1.137). It was agreed that after export confirmation, the electronic issue of certificate of export is fast and convenient (mean= 3.84; std dev = 1.016). The respondents agreed that valuation of cargo with the aid of the electronic systems is fast and convenient (mean = 3.70; std dev = 1.040). There was agreement among respondents that the transmission of customs entries online from DPC for verification is fast (mean = 3.69; std dev = 0.971).

Customs Performance at the Port of Mombasa in Kenya

As shown in Table 2, the opinions of respondents on customs performance at the port of Mombasa in Kenya were also scrutinized.

Table 2: Descriptive Statistics for Customs Performance

	N	Mean	Std. Dev.
Time taken to clear cargo at the port of Mombasa has significantly reduced	151	3.69	.808
The total costs for import-and export-related transactions have significantly reduced	151	3.73	.883
The transparency in import- and export-related transactions at the port of Mombasa has increased	151	3.80	.910
The port clearance procedures are now simple	151	3.70	.874
The capacity for identification and interdiction of high-risk cargo at the port of Mombasa has improved	151	3.60	.730

The findings indicated that it was agreed that the transparency in import and export- related transactions at the port of Mombasa has increased (mean = 3.80; std dev = 0.910). It was agreed that the total costs for import and export-related transactions have significantly reduced (mean = 3.73; std dev = 0.883). The respondents agreed that the port clearance procedures were now simple (mean = 3.70; std dev = 0.874). It was agreed that the time taken to clear cargo at the port of Mombasa has significantly reduced (mean = 3.69; std dev = 0.808). There was general agreement among the respondents that the capacity for identification and interdiction of high-risk cargo at the port of Mombasa has improved (mean = 3.60; std dev = 0.730).

Relationship between Automation of Customs Release Process and Customs Performance

As shown in Table 3, the researcher analysed the association between automation of customs release process and customs performance at the port of Mombasa in Kenya.

Table 3: Correlation Analysis for Automation of Customs Release Process

		Customs performance
Automation of customs releaseprocess	Pearson Correlation	.423**
	Sig. (2-tailed)	.000

It was determined that there is a positive and significant association between automation of customs release process and customs performance at the port of Mombasa in Kenya (r = 0.423; p < 0.01). It means improved automation of customs release process is associated with improved customs performance and vice-versa

Table 4: Regression Coefficients

Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.005	.381		-.013	.990
	Automation of Cargo Documentation	.313	.055	.447	5.663	.000

a. Dependent Variable: Customs performance

It was determined that automation of customs release significantly predicts customs performance (t = 5.663; p < 0.05). The null statistical hypothesis that automation of customs release has no statistically significant relationship with customs performance at the port of Mombasa in Kenya was rejected. Therefore, a significant relationship exists between automation of customs release and customs performance. These findings agreed with the findings of a study by James (2010) which established that the customs department reported improvement in efficiency, effectiveness, staff skills and governance as well as cost reduction due to the use of the Trade X-Simba system.

The results of the t-test of individual regression coefficients clearly depict that the three independent variables and the constant would be included in the regression equation as they were significant (p < 0.05). The regression function shown in Equation 4.1 was used to explain the results of multiple regression analysis.

$Y = -0.005 + 0.313X1 + \varepsilon$…….Equation 1

It was determined that improving automation of customs release by 1 unit enhances customs performance by 0.313 units.

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CONCLUSIONS AND RECOMMENDATIONS

It was determined that there was general agreement that the process of scanning cargo was efficient. It was agreed that after export confirmation, the electronic issue of certificate of export was fast and convenient. The respondents agreed that valuation of cargo with the aid of the electronic systems was fast and convenient. There was agreement among respondents that the transmission of customs entries online from DPC for verification was fast. The study determined that automation of customs release process positively and significantly affects customs performance at the port Mombasa in Kenya ($r = 0.423$; $p < 0.01$). It was determined that enhancing automation of customs verification leads to enhancement of customs performance ($\beta_2 = 0.313$; $p < 0.05$).

This study concluded that automation of customs release positively and significantly affects customs performance at the port of Mombasa in Kenya.

The researcher made a number of recommendations. Firstly, this study recommended that KRA and other stakeholders at the port of Mombasa in Kenya such as KPA should enhance the automation of cargo documentation in order to improve customs performance. Secondly, this study recommended that the automation of customs release should be improved in order to enhance customs performance. Thirdly, the researcher recommended that automation of payment system should be enhanced in order to improve customs performance.

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