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The Strategic JOURNAL of Business & Change MANAGEMENT
ISSN: 2312-9492 www.strategicjournals.com

Vol. 8, Iss. 2, pp 95 – 104. April 23, 2021. www.strategicjournals.com, ©Strategic Journals

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Accepted: April 20, 2021

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 payment system on customs performanceat the Port of Mombasa in Kenya. This study was founded on the unified theory of Technological Determinism (TD). 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 improving automation of payment system leads to improved Customs performance ($\beta_3 = 0.382$; $p < 0.05$) 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, Payment Systems*

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

INTRODUCTION

Applying ICT can lead to reduced waiting times at the borders and the ports, secure and appropriate fees and customs duties processing, simplification of formalities and provision of information to transport operators in time. ICT also results in reduced costs of transactions, enhanced capacities of supply and increased access to global markets (UNCTAD, 2006). ICT improves performance in revenue administration through: Provision of historical information that is readily available; reduction of expenses as well as processing errors and duration; enhancement of services to customers and voluntary compliance and consequently leading to growth revenue collected by government (Edwards-Dowe, 2008; Chatama, 2013). ICT application also diminishes the level of contact between taxpayers and staff involved in administration of revenue hence limiting any circumstances of rent seeking. Moreover, ICT is significant in facilitation of decision making (Edwards-Dowe, 2008; Chatama, 2013).

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

Technological Determinism Theory

The technological determinism (TD) theory argues that technology drives change. TD alters the cultures, structures, reporting lines, norms and modes of operations of organizations, among other aspects (Adler, 2006). For example, the innovation of thepersonal computer has resulted in immediacy and interactive multitasking (Wood, 2004). The TD theory is founded on two main assumptions. Firstly, it is believed thatthe society's technical base is the important condition affecting all social existence patterns. Secondly, it is believed that change in technology is the most fundamental source of societal change (Adler, 2006).

Various social science researchers, especially organizational, have critiques the TD theory (Gitaru, 2017). The critics of TD theory contend

The Strategic Journal of Business & Change Management. **ISSN** 2312-9492 (Online) 2414-8970 (Print). www.strategicjournals.com

that a given technology's impacts primarily depend on the manner of its implementation, which is socially determined. The ever increasing use of new technologies leads to continual renewal of TD theory (Gitaru, 2017). Moreover, issues of politics, interests of various classes,pressures in the economy, academic backgrounds and user attitudes are also leading to changes in technology (Chandler, 2000). According to Misa (2009), TD has for a long time merited reflection and critique by philosophers.

Despite criticism and support by few serious thinkers, assumptions of TD still persist (Best, 2009; Hofmann, 2006; Yang, 2009). TD is a philosophical perspective whichis based on the assumption that inevitable societal changes are triggered by technology hence controlling human society. Technology considered an autonomous force which operates outside the control of society (Hofmann, 2006; Leonardi, 2008; Leonardi, 2009). It is now easy to perform various transactions owing to innovations in technology (Whitey, 2000). Applying the theory to the study, it is implied that using IT in cargo documentation, customs release process and customs payment has been necessitated by the need to see changes in the way customs operations are carried out; and ultimately improve customs performance. The TD 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.

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 the years 1996 and 2000. However, this study did not focuson 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 toexplain 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 Payment System

The views of respondents on automation of payment system were also examined as depicted in Table 1.

Table 1: Descriptive Statistics for Automation of Payment System

	N	Mean	Std. Dev.
The electronic deduction of port charges is convenient	151	3.81	1.094

The online processing of supporting documents after payment is fast and efficient system to facilitate payment	151	3.83	1.076
The KRA online system is effectively linked with bank	151	3.96	.939
The online system of making payments at the port of Mombasa is secure and reliable	151	4.07	.953

There was agreement among respondents agreed that the online system of making payments at the port of Mombasa is secure and reliable (mean = 4.07; std dev = 0.953). The respondents agreed that the KRA online system was effectively linked with bank system to facilitate payment (mean = 3.96; std dev = 0.939). It was agreed that the online processing of supporting documents after payment was fast and efficient (mean = 3.83; std dev = 1.076). The study determined that that the respondents agreed that the electronic deduction of port charges is convenient (mean = 3.81; std dev = 1.094).

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.
The 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 are 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 Payment System and Customs Performance

As depicted in Table 3, the researcher analysed the relationship between automation of payment system and customs performance at the port of Mombasa in Kenya.

Table 3: Correlation Analysis for Automation of Payment System

Customs performance		
Automation of payment system	Pearson Correlation	.510**
	Sig. (2-tailed)	.000

The Strategic Journal of Business & Change Management. **ISSN** 2312-9492 (Online) 2414-8970 (Print). www.strategicjournals.com

It was noted that a positive and statistically significant association exists between automation of payment system and customs performance at the port of Mombasa in Kenya ($r = 0.510$; $p < 0.01$). It means improved automation of payment system is associated with improved customs performance and vice-versa.

Regression Coefficients

Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.005	.381		-.013	.990
	Automation of Cargo Documentation	.382	.056	.536	6.801	.000

a. Dependent Variable: Customs performance

It was established that automation of payment system significantly predicts customs performance ($t = 6.801$; $p < 0.05$). The null statistical hypothesis that automation of payment system 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 payment system and customs performance at the port of Mombasa in Kenya. These findings agree with study findings of Wondemagegne (2014) in Ethiopia which noted that the adoption of ASYCUDA by Ethiopia Revenue Collection Authority (ERCA) led to simplification of the functions of the ERCA. The findings also agree with study findings by Zhou and Madhikeni (2013) which noted that electronic revenue systems increases business efficiency hence resulting in improvements in revenue collection in Zimbabwe.

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 inEquation 1 was used to explain the results of multiple regression analysis.

$Y = -0.005 + 0.382X_1 + \varepsilon$ .....Equation 1

The study determined that improving automation of payment system by 1 unit enhances customs performance by 0.276 units.

CONCLUSIONS AND RECOMMENDATIONS

The study found out that the respondents agreed that the online system of making payments at the port of Mombasa is secure and reliable. The respondents agreed that the KRA online system is effectively linked with bank system to facilitate payment.It was agreed that the online processing of supporting documents after payment isfast and efficient. The study determined that that the respondents agreed that the electronic deduction of port charges is convenient. It was noted that automation of payment system positively and significantly affects customs performance at the port of Mombasa in Kenya ($r = 0.510$; $p < 0.01$). The study also determined that improving automation of payment system leads to improved customs performance ($\beta_3 = 0.382$; $p < 0.05$). The researcher also concluded that automation of payment system positively and significantly affects customs performance at the port of Mombasa in Kenya. It was also concluded that improving system automation will lead to improved customs performance at the port of Mombasa in Kenya.

The researcher made a number of recommendations. Firstly, this study recommends 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 recommends that the automation of customs release should be improved in order to enhance customs performance. Thirdly, the researcher recommends that automation of payment system should be enhanced in order to improve customs performance.

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