Exploring the impact of the Regional Electronic Cargo Tracking System on the key stakeholders in the East Africa Community along the Northern Corridor.

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Abstract

The urge for collaboration, harmonization and enhancement of Trade Facilitation in the East African Community led to the implementation of the Regional Electronic Cargo Tracking System (RECTS) along the Northern Corridor. RECTS is a web-based integrated system at a single platform used to electronically monitor transit cargo under Customs control in real time along the Northern Corridor through Kenya, Uganda, Rwanda to Democratic Republic of Congo and South Sudan. This study explored the impact of RECTS implementation on customs revenue collection and cost of doing business. The study used both secondary and primary data obtained through interviews and questionnaires to elicit responses. Stratified sampling was used to identify participants in the study. The findings of this study showed that Transit Time is reduced by > 50% with electronic monitoring system. This study established that Rapid Response Unit promptly responded to a total of 2,468 of high risk alerts protecting revenue worth USD.37, 271,476 that would be lost in cases of attempted robbery, accidents and diversion. The results indicate that the system is easy to use at 84.8%; is easy to navigate by > 86.9% agreeing that RECT is easy to use. The study concludes that the reduced time lag in the transportation of cargo from the port to their destinations and business premises saves them the costs of handling goods on transit. The study recommends recruitment of more transporters to use RECTS for full benefits..

Keywords: Regional Electronic Cargo System, Northern Corridor, East African Community, Stakeholders

1. Introduction

Customs in Africa are under pressure to play their part in reducing the cost of doing business. Trade transaction costs in much of Africa are currently unacceptably high which increase constraints to the doing of business and eventually have a negative effect on inclusive human development (Asongu & Odhiambo, 2019). The World Bank, through its annual Doing Business publications, has helped to put the spotlight on ways in which Customs is facilitating trade, as well as cases where it is a hindrance (World Bank, 2019). As governments of African countries strive for economic development at different levels, research indicates that customs facilitation reforms have a positive and significant effect on trade and tax revenue (Gnangnon, 2017). Some studies have indicated that embracing technological initiatives in customs procedures and processes is a significant determinant efficiency and economic development in East Africa. (Rael & Maureen, 2015). International organisations like the United Nations Conference on Trade & Development (UNCTAD), the World Bank, World Customs Organization (WCO) and the World Trade Organization (WTO), working together with many African governments have in recent years implemented initiatives that have led to improvement of trade facilitation (Buyonge, 2007).

Customs reform and modernisation initiatives inevitably include elements of trade facilitation. According to World Trade Organization, trade facilitation can be defined as 'the simplification and harmonisation of trade procedures, activities, practices and formalities involved in clearance process for the movement of goods in international trade (WTO, 2015). However, recently, the definition of trade facilitation has been broadened to include the transparency and professionalism of customs authorities, harmonisation of various standards and conformity to international or regional regulations (Grainger, 2007). According to African Development Report (2010), Trade facilitation is a process that includes improvements in simplification of trade procedures and documentation, harmonization of trade practices and rules, improvements in the transparency of information and procedures, recourse to new technologies promoting international trade; and transaction security.

In practical terms from a customs perspective, it is noticeable that most African customs administrations are in the process of reforming and modernising. Trade facilitation is becoming more and more attractive for African leaders due to the need to reduce the costs of doing business and create an environment conducive to enhanced investment for economic growth (Buyonge, 2007). As it is One of objectives to place African countries on a path of sustainable growth and development, and full integration into the global economy is to prioritize building and improving infrastructure, and

accelerating intra-African trade. The EAC Customs Union protocol on regional integration also focuses on harmonizing systems across the region so as to reduce the cost of doing business and create a better investment climate.

The focus on Transit Trade facilitation in EAC trading block is a deliberate move towards simplification of business processes to ease movement of goods in transit or transfer through the partner states. The private sector has a convergence of interests ranging from reducing the existing disconnect in government-to-government, government-to-private sector relations and harmonization of systems across the trading bloc.

Since the inception of Customs Union, there has been efforts amongst EAC partner states to share information and harmonise some procedures so as to facilitate imports and exports clearances. The Revenue Authorities Digital Data Exchange (RADDEx) system was among the first initiatives for sharing export/re-export information bilaterally with other EAC members (Yasui, 2011). Regional Customs Transit Guarantee system are more efficient than a chain of national guarantee systems for transit management (World Bank, 2011), the Authorised Economic Operator compliance programme for mutual recognition of clients, the One Stop Border Post (OSBP) concept implemented amongst the partner states are some of the efforts towards trade facilitation (Moh'd & AL-Shboul, 2016).

In this regard, the regional electronic cargo tracking system has increasingly attracted attention from government and business community in East Africa as a Transit Trade Facilitation tool. Electronic monitoring is an initiative considered to be an effective tool for real time monitoring of the movement of goods from customs station of departure to the destination. The full time watch of the trucks provide transparency through the supply chain and enables business community and government to easily predict business. Truck owners are able to efficiently and in real time monitor their fleet and assessing the behaviour of the truck drivers in respect to time management, route adherence and stop overs. Cargo owners on the other hand are able to monitor their cargo movement, plan order and inventory management.

With the advanced and dynamic growth of technologies, technology adoption models and theories can be used to explain how fast the consumers accept new technologies based on a number of factors such as availability of technology, convenience, consumers' need, security etc. In this study the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, 2003) was adopted and modified to survey stakeholders' 'performance expectancy' and 'effort expectancy' of Regional Electronic Cargo Tracking System (RECTS). Performance Expectancy (PE) was used to measure the benefits and gains expected from RECTS while Effort Expectancy (EE) was used to measure the levels of innovation

in simplification and convenience that RECTS delivers to stakeholders.

Transit trade involves physical movements of goods across borders with suspended customs duties and in most cases without inspection and this paper presents an analysis of the benefits and convenience delivered by the implementation of RECTS towards business efficiency in terms of transit time and revenue performance along the Northern Corridor in partnering countries of Uganda, Kenya, Rwanda, South Sudan and Democratic Republic of Congo (DRC).

2. Problem Statement

Following the ratification of the East African Community Customs Union Treaty as early as 2004, management of transit trade across the five land-locked developing countries of Uganda, Rwanda, Burundi, the DRC and South Sudan remained for a long time, done via a convoy system, characterized by paper based controls, transit log sheets, physical escorts, and transit check points. And yet the Customs Union protocol, requires the partner states to harmonize their border measures to facilitate a smooth flow of goods and products among countries to enhance economic integration between them.

The Commission for Africa in its 2005 Report stated that Customs urgently need reform to address the many internal barriers to trade; such as include excessive bureaucracy, cumbersome customs procedures, and corruption which impede trade facilitation. The roadblocks, checkpoints and lengthy customs procedures makes Africa suffer from the highest average customs delays in the world, 12 days on average. Customs cargo clearance procedures often take a long time and are complex to taxpayers to comprehend and adhere to. Customs delays add to over 10 per cent to the cost of exports. The Doing Business 2019 World Bank reported that the ease of trading across borders between Kenya and Uganda is still characterised with delays taking over 5 days for an export and high costs in transport, border and documentary compliance (World Bank, 2019).

There have been some efforts to implement Transit Trade facilitation in East Africa and some improvements can be attributed to customs reforms such as real-time monitoring of transit cargo using the RECTS. It's propagated by some writers that trade facilitation initiatives come with enhanced controls and minimal interferences related to non-tariff barriers; crucial factors contributing to the economic development (Grainger, 2011). However, no clear imperial research has been conducted to determine the impact of RECTS since its launch in 2017. Therefore, this study will focus on exploring the effect that RECTS as a trade facilitation initiative has had on the stakeholders' businesses efficiency in terms of time, cost savings and revenue performance along the northern corridor.

3. Purpose and Objectives

The Purpose of the study is to explore the impact of the Regional Electronic Cargo Tracking System on the key stakeholders' business efficiency in the East African Community along the Northern Corridor

3.1 Specific objectives;

  i.   To examine the performance expectancy of RECTS to business efficiency
  ii. To assess RECTS user's effort expectancy on business efficiency.

4. Literature review

The impact of implementation of RECTS in East African Community along the Northern Corridor can be explained by various theories and several scholars have attempted to write about some concepts related to trade facilitation. This section highlights some papers related to the study.

4.1 Performance expectancy of Transit management technology on Cost of doing business

Transit Trade business involves transactions and the Transaction Cost Theory assumption that the firm will select the governance form, from the various alternatives amongst the organizational menu, that minimizes transaction and production costs as reported by (Rodrigo, Fernando, & André, 2010) may apply in this study. RECTS being government owned and offered at free cost would be a preferred transaction option for transit monitoring. According the Transaction Costs Theory (TCT), firms must make a comparison between internal and external transaction costs and choose the lowest cost which enables them to increase profits. They can choose to internalize their costs or externalize the costs.

Internalization is best recommended when the cost of doing something in-house is less compared to having it done by external parties like agents. Cargo and truck owners could not develop their own stand –alone systems to monitor their goods and fleet by themselves because of associated costs, they then relied on government procured RECTS to perform this function. The benefits of this system accrue to both government and the private sector. This means for private to take on this system and bear the cost, it will depend on whether the system can reduce the companies' transaction costs to the minimum level to achieve more profits and competitive advantage (Yousuf, 2017).

According to African Development Report (2010) on trade and trade costs in Africa, trade costs are caused by both soft and hard infrastructures along the supply chain. Soft infrastructure includes the border and behind-the-border measures, which RECTS is a trade facilitation tool across

borders. Recent studies have tried to determine how time delays affect international trade. Djankov, Freund and Cong (2006) assert that on average, each additional day that a product is delayed prior to being shipped reduces trade by at least one per cent.

Previous studies have shown that the unprecedented advances in information and communications technology (ICT) have had positive and significant impact on trade, particularly on trade in services. The findings of (Hiranya & Lirong, 2013) indicated that ICT development has significant positive impact on both exports and imports of transportation, travel and other business services.

The RFID technology improves transit management which reduces the inventory costs by up to 70 percent while improving service delivery (Raghu, 2018) . As asserted in a research study about enhancing transit trade facilitation in Jordan, there is no need to escort transit trucks by customs staff; hence, the rate of escort transit trucks is reduced by more than ninety percent, except the bulky and high duty goods. Electronic transit traffic has been increased; the average transit time journey has been reduced by more than seventy percent and has led to decrease in rates of smuggling up to fifty percent (Moh'd & AL-Shboul, 2016).

4.2 Effort expectancy of technologies on efficiency

In a study on emerging issues on the role of Customs in the 21st century in an African perspective, the article identified that ICT and the concept of integrated supply chain management and security in a changing international business environment is another role for Customs (Buyonge, 2007).

Sharing of information between government agencies particularly between Customs departments is vital and effective in transit trade. It enhances the efficiency of Customs transit procedures in regards to monitoring and facilitation. Having adequate and accurate information between Customs and among other partners on transit trade at departure likely remains unchanged throughout the transit by multiple transportation modes, Customs will be able to use it for risk assessment such as type of goods, drivers, mode of transportation, port of origin, port of destination, value of goods, number of illegal violations, etc. and other data reconciliation

4.3 Efficiency in terms of time and revenue performance

Electronic monitoring of cargo give an opportunity for Customs officers to have full view of the cargo in transit and it can be speculated that it's unlikely that such goods can be diverted to the market without payment of taxes. This means RECTS streamlines the handling and movement of cargo in transit. This is emphasised in the study that established that supply chain practices affect company performance (Cook,

Heiser, & Sengupta, 2011). This is supplemented with research that argued that local management control like implementation of RECTS in this case, enhance efficiency in the supply chain (van Veen-Dirks & Verdaasdonk, 2009).

Initiatives like RECTS are geared to improve controls in the supply chain and certainly as reported by (Sezen, 2008) that resource and output performances belong to supply chain design and integration and information sharing are correlated with performance. ICT plays a role in improving the supply chain and research established that inter-organizational ICT has a positive direct relationship with supply chain performance and this relationship is mediated by supply chain integration (Zhang, Van Donk, & van der Vaart, 2016), which RECTS suitable interface between participating revenue authorities.

5. Methodology

The study used an exploratory research design and questionnaires were used to collect primary data from the respondents. The source of secondary data; extracts of revenue performance from and extracts of reports from the RECTS platform. While primary data will be obtained by a survey conducted through questionnaires. The respondents will include the RECTS users are the Customs Officers, Cargo Owners, Clearing Agents and some Transporters in Uganda, Kenya, Rwanda and DRC. Data is extracted from the registered users in the RECTS platform who have experienced usage and involved in the implementation of RECTS along the Northern Corridor as shown in the table below:

Using Krejcie & Morgan, (1970) sampling matrix, a sample of 108 respondents was determined from the population 150 users. Selection of sample elements was done using the random number method where the researcher compiled the list of all elements and assigned numbers equivalent to the appropriate number of subjects and selected randomly to form the desired sample size for the study as shown in Table1.

Table1: Target and Sample population

Category	*Target Population (N)*	*Sample (n)*
RECTS users		
(cargo owners, agents, transporters , Customs Staff)	*150*	*108*

Source: RECTS platform June 2019 (https://rects-ea.org)

Primary data obtained from the questionnaires was analysed at univariate level to obtain the descriptive statistics to explore the underlying efficiency benefits of RECTS to the users and policy makers. While the secondary statistical data analysed using the content analysis approach where the findings were presented following the objectives of the study.

5.1 Data collection instruments

An online self-administered questionnaire designed in terms of Likert five-scale with values; 1-Strongly disagree, 2-Disagree, 3-Not sure, 4-Agree and 5-Strongly agree was distributed via the selected respondents' emails.

5.2 Validity and Reliability

For validity and reliability of the research instrument, the survey questions in the questionnaire were adopted from Unified Theory of Acceptance and Use of Technology (UTAUT) model as applied by (Sarfaraz, 2017) in research on mobile banking. This implies the questions were already standardised and tested for validity and reliability.

6. Findings

Findings from the analysis of primary data collected by questionnaire and secondary data published by RECTS statistical reports is presented and discussed in this chapter.

6.1 Secondary data Descriptive statistics of RECTS performance and effort expectancy

Review of RECTS reports published on the Uganda Electronic Single Window, it was established that RECTS was implemented as a joint initiative between Uganda, Kenya and Rwanda to have e-monitoring of Transits along the Northern Corridor harmonised to enable seamless flow of cargo. RECTS is being implemented by Uganda Revenue Authority, Kenya Revenue Authority and Rwanda Revenue Authority. Secondary data indicated the percentage of electronically monitored transits was at an average of 20% as shown in the Table 2 below:

Table2: Percentage of electronically monitored transits

Year	RECTS statistics 2017-June 2019			
	2017	**2018**	*June 2019*	*Total*
Total Transits	233,922	285,824	*158,075*	677,521
e-monitored	42,845	60,066	*32,135*	135,046
Percentage	*18%*	*21%*	*20.3%*	20%
Total Transit Revenue	2,244,326,888	2,893,145,603	*1,668,047,329*	6,805,519,820
e-monitored Revenue	610,074,700	808,705,566	*294,273,230*	1,713,053,496
Percentage	*27%*	*28%*	*18%*	*25%*

Source: RECTS Report June 2019

In Table 2 above, the RECTS statistics indicate that in the period of 30 months, out of total 677,521 containers worth USD.6.805 Billion in revenue of goods in transit, 135,046 (average of 20%) containers were electronically monitored worth USD.1.71 Billion (25%) protected revenue. This implies that using the electronic seal revenue is assured.

Table3: Reduction of transit time

Transit Time through Northern Corridor	Before 2017	June 2019 under RECTS
Mombasa – Malaba	6 days	3.0 Days
Mombasa – Kampala	14 days	3.0 Days
Mombasa – Elegu	14 days	4.0 Days

Source: RECTS Report June 2019

Reports in Table 3 below indicate that Transit Time reduced by more than 50% with electronic monitoring. For example, Mombasa to Malaba used to take 6 days, now under RECTS tracks take an average of 3days. Mombasa-Kampala (from 14days to 4 days), Mombasa Elegu (from 14 days to 4 days).

It was established that Rapid Response Unit of Uganda Revenue Authority promptly responded to a total of 679 of high risk alerts protecting revenue worth USD. 11,480,550, while in Kenya a total of 1,789 alerts were responded to, protecting USD 25,790,926 that would be lost in cases of attempted robbery, accidents and diversion as shown in the Table 4 below:

Table 4: Effort expectancy and RECTS efficiency in Cargo security/revenue protection.

Incidents Type	URA – RRU (2017-June 2019)		KRA- RRU (2017-June 2019)	
	No.	*BIF saved (USD)*	*No.*	*BIF saved (USD)*
Attempted Robbery	20	394,372	183	3,723,374
Attempted diversion	52	1,840,874	57	647,193
Accident cases	41	749,575	287	3,226,924
Breach of procedure	265	3,704,041	247	3,222,906
Transshipment cases	93	3,073,839	791	10,927,944
Trade Facilitation	208	1,717,849	224	4,042,584

TOTALS	679	USD11,480,550	1,789	USD 25,790,926

Source: RECTS Report June 2019

6.2 Primary data descriptive statistics

A total 108 online questionnaires were issued and feedback was obtained from 99 respondents providing a response rate 91.6%. Most of the respondents were Customs Officers (39%) and Importer/Exporters (34%), while others were clearing agents (19%), Transporters (4%) and others (3%) as shown in the Table 5 below:

Table 5: Categories of respondents.

Category	*Count*	*Percentage*
Customs	39	39%
Importer/Exporter	34	34%
Clearing Agent	19	19%
Transporter	4	4%
Other Specify	3	3%
Grand Total	**99**	**100%**

Source: primary data

6.3 Age, size and experience

Most respondents had operated in all the EAC countries (43%), and 40% in one country while 16% in 2-3 countries, with volumes and period as shown in Table 6 below

Table 6: Age, size and experience

Volumes	*1 - 5 years*	*11 - 15 years*	*16 and above*	*6 - 10 years*	*Total*
1- 100 transits	9	2	1	6	18
1001 - 5000 transits	9	7	5	7	
101 - 1000 transits	11	2	4	11	35
Above 5000 transits	12	8	4		
Grand Total	**41**	**19**	**10**	**23**	**99**

Source: primary data

Table 7: Performance expectancy of RECTS in relation to business efficiency

RECTS performance expectancy	**SA**	**A**	**N**	**D**	**SD**
Using RECTS would improve my performance	42.4%	45.5%	5.1%	2.0%	5.1%
Using RECTS would save my time	41.4%	43.4%	7.1%	2.0%	4.0%
I would use RECTS any place along Northern Corridor	32.3%	48.5%	8.1%	2.0%	6.1%
I would find RECTS useful	47.5%	45.5%	3.0%	1.0%	3.0%
Transit trucks under RECTS take shorter time	41.4%	40.4%	12.1%	1.0%	4.0%
Aggregate average statistic	***41.0%***	***44.6%***	***7.1%***	***1.6%***	***4.4%***

Source: Primary data: [SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree]

For the cargo owners, this reduces the lead time in the supply of buyers' orders and reduces costs such as penalties due to delayed delivery. RECTS also reduces the transport risk exposure that cargo would otherwise be exposed to while in transit if trucks spend long periods on the road. These risks can be accidents, theft of cargo and damage to cargo.

Table 8: RECTS user's effort expectancy on business efficiency

RECTS user's effort expectancy	*SA*	*A*	*N*	*D*	*SD*
Learning to use RECTS is easy for me	37.4%	44.4%	11.1%	3.0%	3.0%
Becoming skilful at using RECTS is easy for me	31.3%	53.5%	11.1%	1.0%	3.0%
Interaction with RECTS is easy for me	26.3%	56.6%	12.1%	4.0%	1.0%
I would find RECTS is easy to use	29.3%	57.6%	9.1%	1.0%	3.0%
Aggregate average statistic	*31.1%*	*53.0%*	*10.9%*	*2.3%*	*2.5%*

Source: Primary data: [SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree]

From Table 8, the users of RECTS reported good experience with the system. They indicate that the system is easy to use about 84.8 percent indicated that it was easy to become skilful in using RECTS system. Usability is a major factor in adopting the use of new technologies. The findings further indicate that majority of users indicate that the system does not require especial skills from what the users already have. This means that familiarization with the system would lead to perfection in using it. The interface also seems easy to navigate by the users as over 86.9 percent indicated that RECT is easy to use.

7. Conclusions

The study concludes that RECTS was an easily adopted technology in performance expectancy and user's effort expectancy on business efficiency. The roll-out of RECTS easily impacted the business community with reduced transit time, improved cargo movement visibility and enhanced cargo security for goods in transit from points of departure to destination, which, also saves on the costs of doing business as well as protection of government revenue for the EAC States along the northern corridor.

The findings have shown that RECTS, is as customs tool presents opportunities for both the users and the policy makers. Both cargo owners, truck owners and customs officials would benefit from the roll-out of this facility to all cargo along the Northern Corridor.

For the truck and cargo owners, the reduced time lag in the transportation of cargo from the port to their destinations and business premises saves them the costs of handling along transit. Drivers are paid depending on how many days they spend on the road. With RECTS, the days have been shortened and drivers cannot have excuses for keeping on the road unnecessarily.

The reduced transport period improves relationship between the cargo owners and the logistics handling companies. Logistic companies are now being viewed as being more timely and efficient in the delivery of their services. These efficiency gains translate into better working relationships between the transporters and the cargo owners

8. Recommendations

The study recommends to government and customs officials to roll out RECTS to all transporters of cargo since it's easily an adoptable technology. This can be achieved through educating the truck and cargo owners of the benefits of this easily adoptable tracking system for real-time monitoring of goods along the northern corridor.

With the findings that RECTS is easily adoptable technology and presents benefits including reduced transit time, cargo security and reduced cost of doing business, there is a need for customs authorities to de-emphasize revenue collection and get to the private sector to appreciate that RECTS and any other cargo tracking system benefits. This will help in changing the perception that RECTS is being imposed on the cargo and truck owners for the benefit of tax collection.

Customs officials need to empower the private sector to adopt the use of tracking systems which can be then integrated into the customs systems for easy management of cargo and revenue collection. Individual companies can invest in the acquisition of these services and have they integrated with Customs systems for easy management and harmonization of interests.

There is a need to retool transporters and drivers to appreciate the benefits of RECTS to them and their employers; the logistics handling companies. Increased efficiency creates opportunities for all the stakeholders in the transport sector; the drivers, cargo owners and truck owners. These benefits strengthen the industry and improve service delivery for all.

Inland transporters can also adopt these tracking systems to facilitate monitoring of fleet and cargo within their country operation. This would help in managing personnel especially the drivers of trucks and the logistics handling personnel.

9. Areas for further research

This study was exploratory in nature, the researchers intended to study who the different stakeholders have responded to RECTS as a new technology in their cargo handling business. Future researchers could explore testing relationships that would between the different aspects of new technology adoption associated with RECTS or other cargo tracking systems. At the moment this area is nascent and still developing, it requires careful study and understanding of the underlying latent variables at play to able to test relationships and associations arising from the variables. Further studies can be undertaken to check the relationships between aspects of new technology adoption associated with RECTS.

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