

IMPACT OF TECHNOLOGY ON REVENUE GENERATION IN THE PUBLIC SECTOR ORGANIZATIONS: A STUDY OF THE NIGERIA CUSTOMS SERVICE, SOKOTO/ZAMFARA AREA COMMAND

Umar Saudatu Tukur (Mrs) and Ahmad Abdulrahman Babangida

Department of Political Science, Usmanu Danfodiyo University, Sokoto

Corresponding Author's email: saudatukur.st@gmail.com



Abstract

Societal problems and creation of public value is seen as a necessity that governments should provide. This have made public sector organizations to embrace innovation such as the adoption of technology in order to achieve desired outcome. Thus, this study examined technology and its impacts on revenue generation with focus on NCS using Sokoto/Zamfara Area Command as unit of analysis. Previous studies have conducted researches on reforms in Nigerian Customs Service (NCS) with scant attention on technology and its impact on revenue generation particularly in the area commands. The study adopted mixed method and used both primary and secondary sources of data collection. The primary data were sourced from exploratory research using questionnaires in which 132 questionnaires were distributed and 100 questionnaires were retrieved with no invalid questionnaire. The secondary data were sourced from relevant existing literatures on the topic under study such as textbooks, customs journals, and seminars papers that were consulted. Data analysis was subjected to multiple regression through SPSS version 25. The findings showed that technology positively impacts revenue generation in NCS with p-value of .000. The study recommends NCS to acquire adequate manpower and more advanced technological facilities like drones, and other ICT related technology that will promote anti-smuggling activities thereby increasing revenue generation.

Keywords: Technology, Revenue Generation and Public Sector

Introduction

The need to promote public sector performance among countries in the global environment has become very high basically because most governments are under intense pressure to improve and sustain their economies. (Fagbezmi, Uadiale and Noah 2010). The adoption of Technology to organize, integrate, coordinate and manage various activities is believed to have become the catalyst for organizational change in the firms and public sphere. The impact of these changes in the public sector have been to change the type of work being performed, demand new levels of productivity and efficiency from those performing the work, and call for a fundamental restructuring of the public sector to reflect the value systems of an information age. Based on this general belief, the public sector organizations have over the years become important consumers of technology, primarily because many public functions such as revenue management, crime-fighting, health and education are essentially information processing tasks (CEF,2007).

In the last twenty years, countries of Sub-Saharan Africa, Latin America and the Caribbean, in line with the OECD and many middle-income countries around the world, have sought to adopt modern techniques of public management that can deliver better, more relevant, and simply more public services despite tight fiscal constraints (World Bank, 2018). Nigeria as a country has also sought to correct challenges of non-performance and inefficiency in the public sector by using several strategies that have been adopted by policy makers through various technological and administrative reforms in order to promote efficient and effective service delivery. As one of the public sector agencies around the world, the international customs community looks to the applied use technology as a catalyst for improving organizational and operational efficiency and effectiveness. As a result, many modernization programs in the customs sector over the last decade have incorporated significant computerization components. Many customs administrations today use varying degrees of automation for example ASYCUDA, NICIS I and NICIS II to effectively support core customs functions such as goods declaration processing, revenue assessment, revenue collection, risk management, and management reporting (WCO, 2018). It is on the basis of this background that this study investigated the impact of technological innovation on revenue generation of the NCS with focus on Sokoto/Zamfara Area Command.

Statement of Problem

The need to transform NCS and maximize the potentials of the service through capacity building and consolidation of E-customs was a result of challenges and pressures faced by NCS which serves as a threat to effective and efficient service delivery such as revenue generation, anti-smuggling activities and trade facilitation. According to Ifah (2017), the major practical challenges faced by particularly prior to technological innovation are, inadequate funding, lack of adequate manpower and inadequate technology to detect smuggling and contrabands, Manual cargo clearance at ports, lack of predictability in trade statistics, prolonged clearance procedure, manual manifest data capture, falsification of trade documents and a lot of human contact which ultimately creates opportunity for corruption and hence loss of government revenue.

To address pressures and challenges, this necessitates the need for constant reforms in the form of innovations in NCS in order to revamp its capacity for improved and efficient revenue generation and overall performance. Part of this is to synergize it with the new idea of technology such as consolidation of e- customs (Automation) in order to address the complex nature of customs activities, enhance revenue generation and effectively reduce leakages while improving and or sustaining relationship with stakeholders. It is on this background, that this study examined innovation and its impact on revenue generation in the Nigeria Customs Service with focus on Sokoto/Zamfara Area Command. The quality of this study lies in its ability to analyse and explore the relevance of the use of technology in NCS, Sokoto/Zamfara area command. By conducting such analysis, the study succeeded in closing existing gap as scant attention has been given to the impact of technology on revenue generation particularly at command units.

Research Questions

The main question of this research is what is the impact of technology on revenue generation in NCS, Sokoto/Zamfara Area Command?

Research Objective

The main objective of this research is to examine the impact of technology on revenue generation in NCS, Sokoto/Zamfara Area Command.

Hypothesis

There are significant relationships between technology and revenue generation in NCS, Sokoto/Zamfara Area Command.

Literature Review

Public Sector Innovation

Innovation is one of those vague but all too popular concepts in public administration and politics that could be perceived as a magic concept (Pollitt & Hupe, 2011). According to Serra (2017), innovation is something that is new, capable of being implemented and has a beneficial impact. It is not an event or activity; it is a concept, process, practice, and capability that defines successful organizations. Generally, innovation is believed to have the capability to promote effectiveness and enhance efficiency in public sector and could help to create public value. Many scholars link public sector innovation theoretically and empirically to larger debates about change and reform, such as those on New Public Management or NPM (Pollitt & Bouckaert, 2017). More recently, interest has sparked on how individual public servants and public managers can be enabled and trained to display more innovative behavior in the public sector in order to be effective in the 21st century (Van der Wal, 2017).

Accordingly, governments and public sector organizations around the world are embracing new innovative approaches to policy making, service delivery and public value creation. These efforts originated particularly from the severe challenges that public sector organizations around the world continued to face which consequently tend to weaken its efficiency and effectiveness in service delivery and creation of public value. In the last few years, this is coupled with governments struggle in recovery from the impact of the COVID-19 pandemic in addition to the negative impact of full-scale invasion of Ukraine by the Russian Federation on the global economy. The effect of these events has been the destruction of lives and livelihoods, and growing humanitarian, economic and governance crises (OECD, 2022). Thus, the need to transform the public sector in order to promote efficiency and effective in addressing societal problems and creation of public value is seen as a necessity that governments must provide in order to respond to global emerging threats while already grappling with issues such as climate change, population, health, low fiscal income and digital disruption (OECD, 2023).

Accordingly, public sector organizations also have embraced stakeholder inclusiveness as a new form of innovation in order to achieve desired policy outcomes. Recently, co-creation has become a major concern in science and public policy. This aim to give a more central role to end users in producing innovation outcomes while public sector remains crucial in shaping both the inclusiveness and outcomes of co-creative innovation (UNCTAD, 2023). Impliedly, public sector organizations have sought to move from the traditional way of manual methods of doing things and the up- bottom approach where by stakeholders do not actually have a say in policy outcomes and move to rather a new and more effective way of governance particularly with the emergence of network governance. Thus, public sector now uses technology and engages and collaborate with stakeholders in new ways and activate them as change agents. The most compelling examples are novel in the approach, scale or focus areas on which they engage the public. One notable approach is in Germany, France in which a vast consultation of 95,000 young people in under the Conference on the Future of Europe in government decision making (OECD, 2023).

In Nigeria, public sector organizations such as NCS have introduced and implemented series of reforms and innovations such as adoption of technology, administrative reforms in form of welfare of staff, training of staff among others to which the organization have succeeded in

enhancing revenue and promoting the integrity of customs service staff. Furthermore, the organization have put commendable efforts to build and sustain relationship with stakeholders. These efforts led to the creation of network platforms such as NICISii and ASYCUDA++ for effective communication with stakeholders. From the foregoing opinions, it could be argued that innovation in the public sector have recently attracted a large sum of attention and is perceived to have the capability to promote and enhance performance in public sector. Among public sector innovation generally contested to positively impact public sector include the adoption of technology and stakeholder participation or inclusiveness in policy formulation and implementation. This is for the fact that technology makes things easier, faster and productive while stakeholder participation is necessary for achievement of desired policy outcomes.

Impact of Technology on Revenue Generation in The Public Sector: Since the beginning of the Information Age, around the turn of the 21st century, a tidal wave of new technology-driven applications engulfed business, government, and society. New technologies are widely perceived by many scholars and researchers as the enlightened way to improve the efficiency and quality of processes. In parallel to the development of e-government, the relationship between technology and organizational changes in the public sector has become the subject of increasingly intensive research and study. For at least four decades, technology has gradually penetrated and influenced the operation of public sector organizations by changing and increasing its role with every new technological cycle. In the early stages, the influence was primarily visible in regard to the execution of administrative and technical as well as simpler professional tasks. During the later stages of intensive computerization in particular during the e-government period the influence of technologies upon the execution of processes rapidly increased, thereby causing them to become more standardized, formalized and more effective (Lember, Kattel, & Tõnurist, 2017).

According to Nograsek & Vintar (2011), technology gives major leap forward in all spheres of operation of public sector organizations, namely in internal and external operations. This have made public sector organization to embrace the use of technology in all processes including revenue generation. Akitoby (2018), argues that successful revenue mobilization hinges on managing information and leveraging the power of big data to improve compliance and fight corruption. He further stressed that countries have taken advantage of IT systems to leap frog their revenue mobilization reforms. For example, Georgia has automated most processes, including e-filing. It has also instituted a system for information sharing among tax authorities, taxpayers, and banks, as well as a one-stop Internet portal. Cambodia, Guyana, and Liberia have likewise computerized the administration of their taxes and customs. Similarly, countries like Nigeria and other developing countries such as Uganda, Rwanda and Kenya have also embraced electronic filing of tax returns (Muita, 2011).

According to Hamid (2020), technology has improved efficiency in tax collection and has led to a paradigm shift in work flow process of automation and creation of new capabilities proved to achieve excellence in revenue generation of organizations through development of sophisticated data tracking systems to detect delinquency, underpayments, fraud and corruption as well as develop incentives to encourage compliance. In Nigeria, the NCS uses ICT and automation to reduce leakages from underpayment, undervaluation, risk assessment, misclassification as well as uses technology to communicate with stakeholders and ensure compliance. According to Spendesk (2020), modern technology gives government revenue agencies the leverage to be better prepared in fulfilling future needs and could assist in decision making focusing on areas for improvement to increase revenue generation. In a Similar view by Garicano & Heaton (2017), argued that the impact of technology on public sector performance is more sobering as a result

of bureaucratization, increased agency size, greater use of written directives and a larger share of non-production personnel with little or no impact on productivity. According to them, they argued that public sector is likely to enjoy the benefits of computerization only when they identify the specific ways the new information and data interact with existing organizational practice and make adjustments accordingly.

Empirical Research

Yuda (2013) examined the use of ICT's influence on modernized Tax administration procedures and revenue collection in Taxpayer Department of Revenue Authority in Tanzania. The ICT was introduced in 2001 in the department for expediting maintenance and well-timed access to records. The study output, after descriptive research was employed, showed that ICT had influence on modernized Tax administration procedures and revenue collection in Taxpayer Department of Revenue Authority in Tanzania. ICT minimized operational costs; removed postal delay, plug loss in revenue. Oyediji (2017), conducted research titled usage of information and communication technology among Nigerian Customs Personnel. The paper adopted descriptive research survey design and a sample of three area commands of the NCS which consist of Oyo/Osun Customs area command, Kirikiri Lighter Terminal Customs area command, and Seme Customs area command. A total number of three hundred personnel was randomly selected using simple sampling technique in the research. The study finds out that there was a significant relationship between usage of ICT among NCS Personnel. The result also showed that the magnitude at which the NCS personnel were using the available ICT tools was very high.

Adegbite et al (2019), conducted research and investigated the impact of ICT on revenue generated from tax in Oyo State. Primary data were collected through administered questionnaire from staff of Oyo State board of internal revenue service and other taxpayers with a sample size of 350. The research finds out that concluded that ICT has positive significant and statistical impact on tax revenue generation in Oyo State. ICT is a highly effective tool which enhances taxation cash inflow in the state. Otieno et al (2013), carried out research on effect of information systems on revenue generation by local authorities in Homa Bay County, Kenya. A structured cross-section survey was used to collect data from 2,007 individuals. The study found that: there is a relationship between Information Systems and both efficiency and effectiveness in revenue collection, there is a strong positive relationship between Internal Control Systems and revenue collection as reported by 97% of the respondents.

In a nutshell, several studies have indicated that there is correlation between public sector performance and technology strategy where as other have indicated that technology strategy when centred, do not have great impact on organization change. However, majority of these studies are conducted within the context of developed countries with scant attention given to African countries. As such, there is the need for systematic analysis and study to be replicated in Nigeria taking peculiarities from such revenue generating agencies in Nigeria such as NCS. Therefore, this study analysed the impact of technological innovation on revenue generation in a public sphere within the context of Nigeria thereby closing gap and adding knowledge to existing body of literature.

Theoretical framework

The research adopts unified theory of technology as the theoretical framework. Recently, the unified theory of acceptance and use of technology has taken place as one of the most developed and intensive models to test technology adoption and acceptance (Ahmad 2014). The theory is a well-defined technology model articulated by Venkatesh (2003), embedded as User acceptance

of information technology based on benefit/gain. This theory was postulated and established as a result of various research efforts to unify terminology of variables of different models and theories of technology acceptance. Thus, an alliance of eight constructed models that previous research had used to elucidate information on usage behaviour (reasoned action theory, motivational model, technology acceptance model, planned behaviour theory, a theory of combination of technology acceptance model and planned behaviour, personal computer usage model, social cognitive theory and innovation diffusion theory (Ahmad, 2014).

The UTAUT theory, despite its widespread use, faces limitations in explaining user behavior and attitudes towards technology adoption. One key limitation is the potential under performance in educational contexts. Furthermore, it is a very common problem for end users (managers, employees, professionals) to resist using such technologies (Ayaaz, 2020).

The adoption of this theory lies in its utility to emphasize on acceptance and usage of technology for revenue collection system. Based on constructed keys that determines the usage of technology namely; effort expectancy; performance expectancy; facilitating conditions and social influence. According to the theory, the direct determinants of usage behaviour, attitude and intention are the first three while the fourth is the direct determinant of adopted behaviour

Methodology

Research Design

This study used case study design and quantitative method was adopted. The rationale is that the quantitative results provide a general picture of the research problem (Creswell, 2003).

Location of the study

NCS Sokoto/Zamfara Area Command headquartered in Sokoto State with border stations as follows:

Table 3.1: Border Station in Sokoto/Zamfara Area Command

Number	Border Station
1	Illela
2	Sabon Birni
3	Gudu/Rafin Duma
4	Tangaza

Source: Field Work (2022)

The study was conducted majorly at the NCS headquarters and questionnaires were distributed to border stations and outposts. Sokoto is the capital of Sokoto State in North West, Nigeria. Sokoto is a major city located in extreme north-western Nigeria, near the confluence of the Sokoto River and the Rima River with an estimated population to be close to 5.4 million (Nigerian Population and Development, 2017). Sokoto State is located between longitudes 11o 30` to 13o 50` East and latitude 4o to 6o North and a land area of 28,232.37sq kilometer. The state has a hot semi-arid climate and it is located in the dry Sahel surrounded by sandy savannah and isolated hills with an annual average temperature of 28.3 °C (82.9 °F) and is one of the hottest cities in Nigeria. (Wikipedia, 2021).

Population of the study

The estimated number of population size in the study is one hundred and ninety-seven (197) which is the total number of NCS staff in Sokoto/Zamfara Area Command as at the time of this research.

Sampling Technique and Sample Size

TABLE 3.2: Sample size

Population	Sample size
190	127
200	132
1,000,000 and above	384

Source: Kreicei and Morgan, (1980)

According to the table above, if the population is one million and above, the sample size is 384. Hence, we choose sample size for 200 as there is no sample size for 197. The formula is as follows:

$$S = X^2 NP (1-P) + d^2 (N-1) + X^2 P(1-P)$$

S= required sample size

X^2 = Table value of chi-square

N= Population size

P=Population proportion, assume to be .50

D= Degree of accuracy

Method of Data Collection

This study used two major types of data that is primary and secondary data. The primary data were sourced from questionnaire which were deployed in NCS Sokoto/Zamfara Area Command.

The secondary data were sourced from relevant existing literature on the topic under study, from monographs, journals, magazines, seminars, newspapers, that were consulted. In addition, relevant official documents were also consulted in order to elicit information related to the study. All the aforementioned secondary sources of data were critically studied and relevant information derivable from them were used to complement the outcome of the primary data.

Instrument of data collection

The instrument that was used to collect data is questionnaire. Structured questionnaire was designed to provide answers to questions relevant to the subject matter of the study. The justification for using questionnaire is because respondents are many and distributed across different border stations therefore, questionnaire was found most suitable in this research.

Questionnaire Administration and follow-up

The study used stratified simple random sampling to select respondents. By this, respondents were put into strata and respondents were choose conveniently based on availability and readiness of the respondents to attend to the questionnaires. However, the number of

respondents were selected in proportion to the total number of staff in each stratum and departments.

Scale dimension

The questionnaire comprised of two parts; the first part contains demographic data of the respondents such as gender, qualification and working experience. The second part contains the substantive issues of the research. It is worthy of note that, a five-point likert scale type of questionnaire was used in the study. Bryman (2012), posits that a five-point likert scale questionnaire is the one in which respondents are provided with a statement, in which they will be asked to indicate their level of agreement or disagreement with each statement by indicating whether they: Strongly Agree (SA), Agree (A), Neutral (N), Strongly Disagree (SD) and Disagree (D). The scales are categorized as 1,2,3,4 and 5.

Method of Data Analysis

The study used descriptive statistical tool to analyse data. Thus, the data gathered from questionnaires administration were analysed quantitatively using tables and simple percentages. The data was subjected to regression analysis using SPSS version 25.

Data Presentation and Analysis

Table 4.1: Number of Questionnaires Distributed

Responses	Frequency
Questionnaire distributed	132
Questionnaire retrieved	100
Number of Questionnaires valid	100
Number of Questionnaires not valid	Nil

Source: Questionnaire Administered (2022)

Table 4.1 shows the numbers of questionnaires distributed. One hundred and thirty-two (132) copies of questionnaire were distributed for the sample size of 132. At the same time, 100 questionnaires are valid, none of the questionnaire are invalid. In line with the suggestion of Mugenda (2003), fifty percent (50%) is adequate for data analysis.

Reliability Test

Reliability test was run to determine internal consistency of the data, ten items were used to test technological innovation and the Cronbach's Alpha shows .775. Six items were used to test revenue generation and the Cronbach's Alpha shows .630. Sekaran (2009), suggested that reliability test of .70 is accepted, therefore these variables Cronbach's Alpha are accepted in line with suggestion above.

Demographic Data of the Respondents

Table 4.2: Sex Distribution of the Respondents

Responses	Frequency	Percent
Male	96	96.0
Female	4	4.0
Total	100	100%

Source: Questionnaire Administered (2022)

Table 4.2 shows sex distribution of the respondents. Out of 100 respondents, 96 % of the respondents are males while 4% of the respondents are females. This indicates that majority of the respondents are males. This is on the basis that the number of recruited male officers are more than number of recruited female officers in the area command. However, NCS uses the term "Officers and Men of Service to refer to both men and women in the service". This shows that the official language of the service is gender biased as both male and female in the service are referred to as either officers or men of the service.

Table 4.3: Educational Qualifications of the Respondents

Responses	Frequency	Percent
PhD	07	7
M.Sc	25	25
HND/Degree	34	34
PGD	07	7
OND/ND/NCE	18	18
SSCE	09	9
Primary	00	0
Total	100	100%

Source: Questionnaire Administered (2022)

The table above shows the educational background of the respondents. Seven (7) respondents representing 7% are Ph.D. holders, 25% are M.Sc. holders, 34% has Degree /HND, 07% has PGD, 18% has OND/ND/NCE, nine 9% has SSCE and 0% has primary certificate. This implies that majority of officers in NCS, Sokoto/Zamfara Area Command are degree holders. This is because majority of officers in the command falls under the rank of Superintendent Cadre (from one star upwards) which requires degree certificate. However, only degree certificate is required for promotion from one star to comptroller general of NCS.

Table 4.4: Age Distributions of Respondents

Responses	Frequency	Percent
18-25	13	13
26-35	21	21
36-45	39	39
46-55	24	24
Above 55	3	3
Total	100	100%

Source: Questionnaire Administered (2022)

Table 4.4 indicates that 13 people representing 13% of the respondents fall within the age range of 18-25, followed by those within the age bracket of 26-35 which constitutes total number of 21% of the respondents, the category of respondents within the age bracket of 36-45 is represented by 39% while respondents within the ages of 45-55 represents 27% and lastly those from ages above 55 are represented by 3%. By implication, majority of officers in the command fall within age range of 36-55 years while majority of respondents for this study fall within the range of 36-45 years considering the fact that this percentage dominates the age range within the command.

Table 4.5: Marital Status of Respondents

Responses	Frequency	Percent
Married	85	85
Single	10	10
Separate	02	2
Divorce	03	3
Total	100	100%

Source: Questionnaire Administered (2022)

The table indicates that, 85% of respondents are married, 10% respondents are single, 2% percent are separated from spouses and only 3% are divorced. By implication, this shows that majority of respondents for this research are married.

Table 4.6: Accessibility to appropriate technology in NCS

	Frequency	Percent
D	9	9.0
N	6	6.0
A	61	61.0
SD	24	24.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Table 4.6 indicate responses regarding access to appropriate technology in NCS Sokoto/Zamfara Area Command and 9% respondents disagreed, 6% respondents are neutral, 61% respondents agreed and 24% respondents strongly agreed. This implies that 85% of the respondents generally

agreed that the command has access to appropriate technology. This percentage is adequate enough to support the fact that the command uses adequate technology such as computers and network platforms such as NICIS and ASYCUDA to carry out activities.

Table 4.7: There is effectiveness in the use of technology in NCS

	Frequency	Percent
D	2	2.0
N	4	4.0
A	69	69.0
SA	25	25.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Table 4.7 indicates the distribution of respondents on the effectiveness of technological tools used in the command, it shows that 2% disagreed, 4% are neutral, 69% agreed and 25% of the respondents strongly agreed. This indicates 94% of the respondents agreed with effectiveness in the use of technology for reasons such as it makes work easier and fast and also enhances revenue generation. The percentage of respondents that disagreed and the percentage of those that are neutral is insignificant to explain otherwise.

Table 4.8: NCS Adapts to the use technological tools

	Frequency	Percent
SD	2	2.0
D	8	8.0
N	15	15.0
A	60	60.0
SA	15	15.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Table 4.8 indicate responses with regards to adaptability of staff in using technological tools in the command. It shows that only 2% strongly disagreed, 8% disagreed, 15% are neutral, 60% of the respondents agreed and 15% strongly agreed. With 75% positive, this means that majority of the staff in the command adapts to the use of technological tools. The number of respondents with negative responses could be attributed to the fact that these respondents find it difficult to adapt to technology for reasons such as lack of skill to use technological tool or not interested in using technological tools to carryout activities.

Table 4.9: There is sufficient electricity to use technological tools

	Frequency	Percent
SA	11	11.0
D	29	29.0
N	11	11.0
A	33	33.0
SA	16	16.0
Total	100	100.0

Source: questionnaire Administered (2022)

Table 4.9 present the distribution of respondents about whether there is sufficient electricity to use technological tools. It shows that 11% disagreed, 29% Strongly disagreed, 11% are neutral, 33% agreed and 16% strongly agreed. The table show that 49% generally believe that there is sufficient electricity. However, it could be argued that electricity is not sufficient in the command because the general percentage of negative responses is also significant at 40%.

Table 4.10: Computers are used to execute work effectively

	Frequency	Percent
SD	1	1.0
D	1	1.0
N	5	5.0
A	67	67.0
SA	26	26.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Table 4.10 indicate responses on the effectiveness in the use of computer in the command. It shows that only 1% strongly disagreed, only 1% respondents disagreed, 5% are neutral, 67% agreed and 26% of the respondents strongly agreed. This indicates that 93% of the respondents generally believe that there is effective use of computer to execute work in the command. This believe could be largely attributed to the fact that all work is executed in the command effectively through the use of computers and automation.

Table 4.11: There is the use of appropriate software to manage work effectively

	Frequency	Percent
D	4	4.0
N	10	10.0
A	62	62.0
SA	24	24.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Table 4.11 show the distribution with regards to use of appropriate software to manage work effectively. It reveals that 4% of the respondents disagreed, 10% respondents are neutral, 62% agreed and 24% of the respondents strongly agreed. From the responses, it could be argued that 86% generally agreed to the effectiveness in the use of software to execute work in the command.

This could be attributed to the efficiency and reliability on the command's computer software to make work simple and fast. The command uses network platforms designed by software to make all import/export declaration.

Table 4.12: Internet is used to communicate with stakeholders

	Frequency	Percent
SA	1	1.0
D	3	3.0
N	6	6.0
A	61	61.0
SA	29	29.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Table 4.12 show responses on the use of internet to communicate with stakeholders. It shows that 1% respondents strongly disagreed, 3% respondents disagreed, 6% respondents are neutral, 61% respondents agreed and 29% strongly agreed. This implies that 90% percent of respondents generally agreed that internet is used to communicate with stakeholders. This could be related to the fact that all network platforms used to communicate with stakeholders requires internet in order to be accessible.

Table 4.13: Technological tools in the command are very effective in curtailing smuggling activities

	Frequency	Percent
SD	3	3.0
D	37	37.0
N	26	26.0
A	25	25.0
SA	9	9.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Results from table 4.13 indicates the distribution of respondents on the effectiveness of technological tools to detect smuggling activities. It shows that 3% of the respondents strongly disagreed, 37% respondents disagreed, 26% respondents are neutral, 25% of the respondents agreed and only 9% strongly agreed. This shows that while 40% of the respondents generally disagree that technological tools in the command are effective in curtailing smuggling activities, only 34% generally agree to the statement. By implication, this shows that technological tools in the command are inadequate to curtail smuggling activities in the command.

Table 4.14: There are specialized gadgets to easily detect contrabands

	Frequency	Percent
SD	5	5.0
D	26	26.0
N	33	33.0
A	33	33.0
SA	3	3.0
Total	100	100.0

Source: Questionnaire administered (2022)

Table 4.14 reveals that the distribution of respondents about whether there are specialized gadgets to easily detect contraband. It shows that 5% strongly disagreed, 26% disagreed, 33% are neutral, 33% agreed and 3% of the respondents strongly agreed. This further shows that 36% generally believe that there are specialized gadgets to detect contrabands and 31% generally believe otherwise. Although there is positive response by 31%, the percentage of responses that disagreed at 36% and percentage of responses that are neutral at 33% is very significant to explain that specialized gadgets could be available in the command but not adequate to easily and effectively detect contrabands.

Table 4.15: There are new ways of improving the use of technology effectively

	Frequency	Percent
D	6	6.0
N	29	29.0
A	42	42.0
SA	23	23.0
Total	100	100.0

Source: Questionnaire Administered (2022)

Table 4.15 indicates responses on effort to create new ways of improving the use of technology and the responses show 6% respondents disagreed, 29% respondents are neutral, 42% respondents agreed while 23% respondents strongly agreed. this means that majority of respondents who forms 65% have generally agreed that there are new ways of improving the use of technology in the command. However, 29% of respondent that are neutral and more inclined to be on the side of respondents that disagreed forms a significant number that could explain the new ways of improving technology could not be considered as very effective. This could be reasons such as delay in the introduction of new technology or mismanagement of current technology perceived by the minority number of respondents that disagreed.

Table 4.16: Model Summary Table

Model Summary^b

R	R Square	Adjusted R Square	Change Statistics					Sig. F Change
			Std. Error of the Estimate	R Square Change	F Change	df1	df2	
.680 ^a	.462	.445	.12427	.462	27.477	3	96	.000

a. Predictors: (Constant) MeanTech

b. Dependent Variable: MeanRG

The table 4.16 above shows the model summary table, the empirical findings shows that R has .680 which indicate 68% correlation between the independent variables and dependent variable, R² stood at .462 which shows that the overall model explains by 46%. The adjusted R² stood at .445 also indicates that the independent variables explain 45% of revenue generation.

Table 4.17 Coefficients Table

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
1	(Constant)	-.065	.070		-.930	.355	-.203	.073
	MeanTech	.271	.120	.243	2.255	.026	.032	.510

a. Dependent Variable: MeanRG

The above table 4.17, shows the outcome of the variable on the issue under review below: -

HO: There is significance relationship between technological innovation and revenue generation in Nigeria Customs Service Sokoto/Zamfara Area Command. The B stood at .271, Std. Error stood at .070, and Beta stood at .243, t statistics stood at 2.255 with p-value of .026. The p-value is less than 0.05, indicating a 95% confidence level of the positive impact of technology on revenue generation in NCS, Sokoto/Zamfara Area Command in the model. This implies that the study has enough statistical evidence to accept the alternative hypothesis. Based on the above analysis, the study accepts the alternative hypothesis.

Discussion of Findings

Findings from tables 4.6 to 4.14 suggest that the use of technology has positive impact on revenue generation in NCS, Sokoto/Zamfara Area Command. It is evident from the data that NCS Sokoto/Zamfara Area Command have access and uses the appropriate technology available through automation, internet, computer and network platforms such as NICISii and ASYCUDA++ to reduce leakages and enhance revenue generation as shown in tables 4.5, 4.7, 4.9 and 4.10. Indeed, table 4.6 have shown that an aggregate of 94% of respondents are in agreement that there is effectiveness in the use technology to enhance revenue generation in the command. The finding is also consistent with NCS September Monthly Order (2013), which stated that the increase in revenue generation in NCS was attributed to modernization of the NCS procedures which has to do with technological innovation and also concluded that the increase in revenue

collection in NCS from 327.2 billion in 2004 to 741.8 billion in 2011 and the increase in subsequent years was as a result of the implemented technological reforms.

This is in line with Spendesk (2020) who posits that modern technology gives government revenue agencies the leverage to be better prepared in fulfilling future needs and could assist in decision making focusing on areas for improvement to increase revenue generation. This corroborates with Hamid (2020), who posits that technology has improved efficiency in tax collection and has led to a paradigm shift in work flow process of automation and creation of new capabilities proved to achieve excellence in revenue generation. This is in tandem with the unified theory of acceptance of technology (Venkatesh, 2003) which embedded user acceptance of technology based on benefit/gain.

Findings of the study also revealed that commendable efforts have been made in the use of technological innovation in NCS Sokoto/Zamfara area command such as automation through computer system, software application and platforms such as the Internet, World Wide Web, online database, PAAR, ASYCUDA++ and NICIS II and other networking technologies to enhance performance and detect fraudulent activities in the areas of proper documentation of imported goods, exports and excisable goods for onward collection of expected revenue. However, based on findings from the research, it is evident that the use of technological tools and specialized gadgets that are needed to fight smuggling and detect contrabands such as drones, scanners and cameras are only to the advantage of the national and other unit commands as these tools are not being deployed and used in NCS Sokoto/Zamfara Area command.

Moreover, this has served as an avenue for corrupt customs staff to seal deals with marketers frequently in order to successfully find way for their illicit goods into the country. Continued negligence in this aspect will adversely affect revenue collection taking into consideration that Sokoto State have major land borders such as Illela border and S/Birni border where marketers legally and illegally import goods into the country from various places across the world. This is in line with Ifah (2010), who posits that among the practical challenges faced by NCS is inadequate manpower and technology to detect smuggling and contrabands, falsification of trade documents and a lot of human contact between staff and marketers at border stations which ultimately creates opportunity for corruption and hence loss of government revenue. This suggests a lot need to be done at the command units in form of decentralization of the use technology including commands that are largely made up of land borders and located in the hinterland, particularly that of Sokoto/Zamfara Area Command.

Conclusion

The NCS as a viable revenue generating agency introduced and implemented the use of technology to enhance the performance specifically in terms of revenue generation and effective reduction of leakages. Although, this development has brought significant improvements in the agency performance. The bottom line is that introduction and implementation of innovation through ICT and software packages do not serve as the only catalyst for the agency to achieve effectiveness in revenue generation. This is evident in the fact that despite technological innovation, majority of importers have continued smuggling as a result of high cost of custom duty which to them is an issue of more concern than ease of work and interaction brought by technology. Furthermore, the fact that NCS, Sokoto/Zamfara Area command does not have the adequate technological tools to fight smuggling and detect contrabands have served as limitation to its effective performance and also an advantage to corrupt customs officials to divert moneys for their personal gains.

Thus, the study concluded that both the government and NCS should be proactive and not reactive in dealing with internal and external forces that affects revenue generation. The implication is that leakages if not handled effectively through provision of technological tools and reforming of customs officers' integrity, leakages would continue to affect revenue generation in the command significantly.

Recommendations

- i. The study recommends that; government should provide NCS at state levels with more advanced technological tools that would significantly improve customs operations in revenue generation. These include scanners, drones, artificial intelligence and machine learning and biometrics. This would minimize leakages and enhance revenue generation.
- ii. The government should reduce the high cost of duty and involve relevant stakeholders especially importers and other stakeholders in decisions that relate to benchmark. By this, stakeholders would put more trust and assurance on the government as well as be encouraged to pay duty.
- iii. In order to significantly minimize leakages, government should improve staff welfare and create a redress forum where marketers could lay complains and get justice. Corrupt officers should be dealt with severely and sincere officers should be encouraged and motivated. The government should also equip them with advanced technology like drones, scanners and cameras in other to curtail smugglers and smuggling activities.

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