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Information technology and its impact on revnue gneration in Nigeria

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Abstract
This study examines how the Federal Inland Service in Nigeria generates money in relation to information technology. The work used secondary data. After analysis, these data will be shown in tables. With the use of Stata 16, two hypotheses were developed and tested using the sample independent t-test. The results showed that information technology can expedite accountability and transparency in the Nigerian tax authority's administrative structure, as well as enhance the relationship between the tax authority and taxpayers. The study's findings showed that the application of IT streamlines the process of collecting taxes and has the potential to improve its efficacy and efficiency in terms of the resources, opportunities, and skills needed by both sides. The scope of this study was restricted to the influence of IT on tax revenue generation in Nigeria; however, future research could focus on the effect of IT on other tax collections, such as the petroleum profit tax collection in Nigeria.

Keywords: Transaction, governments, specialists

Introduction

No doubt, that the use of electronic system for tax collection has become more important in revenue generation in Nigeria. In an effort to increase tax collection, electronic tax systems were first introduced internationally more than thirty years. Since then, these systems have become a common network activity that annually benefits a number of taxpayers all over the world. The taxpayers require a system that enables them to pay their taxes online on several platforms using either their personal or business bank accounts. According to Okoye and Ezejiofor (2019), e-taxation is a tax system administration that is carried out online for the transaction. They emphasised that as e-taxation is a method for electronically submitting taxes, e-tax payments can be done right away using bank accounts, ATMs, debit cards, credit cards, or even mobile devices. The adoption of electronic taxes was reportedly done to boost the country's tax revenue collection.

The collection of taxes in Nigeria has nevertheless remained a very serious problem in light of all of this, requiring prompt action from many, especially from developing nations like Nigeria. This has been the primary argument for the revenue administration's use of this to offer the individual an open product.

According to Ofurum (2018), the majority of the nation's income is derived from non-assessable sources such as government-claimed organisations' benefits, national bank pay, capital receipts as outbound credits, and liabilities from foreign financial institutions. These bases cover fees assessed for the advantages and successful development of individuals and groups as well as for the creation of homes and workplaces. Government revenue is a crucial element of the financial strategy. There is a lack of empirical research demonstrating the degree to which the new technology has succeeded in achieving this goal concerning company income tax, value added tax (VAT), stamp duty, education trust fund, and capital gain tax, necessitating further study. It is also widely accepted that the primary motivation behind the implementation of information technology in the field of taxation through the use of electronic tax is to enhance the system's ability to collect revenue. In recent years, rising nations have realised the growing significance of electronic revenue collection, including e-company income, e-VAT, e-stamp duty, e-capital gain tax, and others. Nisar (2016) cites recent advancements in public taxation as evidence of the need to build an online system for tax assessment and collection. Some of the factors that account for this include the potential benefits of taxes for state building, independence from foreign aid, the fiscal effects of trade liberalisation, the financial and debt crisis in the West, and the urgent financial requirements of developing countries.

Due to these challenges, there is a difference between the potential tax revenue that governments in poor countries like Nigeria could collect and what they collected. Muita (2014) cites the adoption of evolving technology and more efficient tax payment methods as one of these issues in order to combat tax evasion, which has a negative impact on the economy. The e-tax platform has been in use for the past 30 years, according to Cobham (2015). When only five taxpayers from Cincinnati, Raleigh, Durham, and Phoenix (2017) agreed to participate in a small pilot research in 1986, it may be said that this is when it all began. Since then, the adoption of automated tax systems has grown to become the norm, helping millions of taxpayers each year all around the world.

According to Wasao (2019), an electronic tax system is a website where the taxpayer can access all of the services provided by the financial authority, including the registration of personal identification numbers, the filing of returns and the issuance of application compliance certificates. The federal government's 2013 implementation of an electronic taxation system is a prime example of such a system. A remedy for this productivity in terms of tax revenue collection is the e-tax platform.

About 45% of taxes that are not collected due to corruption and avoidable leakage occur in developing countries Nigeria in particular, as evidenced by the fact that many of them, like Nigeria, lack an efficient tax collection system (IMF statistics report, 2022). The effectiveness and efficiency of tax revenue collection may be impacted by the manner of

collection. Information technology is utilised more frequently to collect taxes in wealthier countries (Gideon & Alouis, 2018). Given the investment in modern technology and the possibility of cost savings, it is imperative to educate and motivate taxpayers to use the electronic service system.

According to the Federal Inland Income Service and the Central Bank of Nigeria (CBN), the percentage of tax hikes in Nigeria climbed from 5.2 percent in 2014 to 30 percent in 2019. Furthermore, according to numbers that are easily accessible, this percentage has stayed below 35% since 2001 and tax revenues have not made up up to 52% of the money that the federal government has collected since this time (FIRS, 2022). The e-tax was implemented with the intention of combating vices related to tax revenue collection, such as tax evasion, filing fraudulent tax returns, and claiming unauthorised tax refunds (Wamathu, 2014). The impact on the poor is not being felt because tax income collection has been incredibly low and Nigeria has not undergone any physical expansion. Lack of labour force, dishonest actions by tax collectors, and taxpayers' ignorance of the significance of paying taxes are a few of the obstacles to tax revenue (Afuberoh & Okoye, 2019).

This study aims to analyse the variation in tax revenue in Nigeria before and after the development of information technology. But the following are the study's particular goals:

to determine whether there are significant differences in tax revenue between the VAT in Nigeria before and after the use of information technology.

to assess how the capital gains tax has affected tax collections in Nigeria both before and after the development of information technology.

To achieve the aforementioned goals, the following null hypotheses will be created and tested:

H_{01}: Before and after the VAT, information technology had little effect on tax revenue in Nigeria.

H_{02}: Before and after the emergence of information technology, the capital gains tax had little effect on Nigeria's tax revenue.

Conceptual Framework

E-taxation is the implementation, assessment, and collection of taxes by electronic means. E-taxation is one way that governments use ICT to enhance public service delivery and public access to information about public administration, according to Che-Azmi & Kamarulzaman (2014).

The automated taxes system that FIRS built in Nigeria is one example of this. An electronic tax system, according to Wasao (2014), is an online platform that enables a taxpayer to access all financial authority services online, including applications for compliance certificates, the submission of returns, and the registration of personal identity numbers. A secure, web-enabled application system called an electronic tax system offers a completely automated and integrated way to handle domestic taxes. It makes it possible to register for a PIN online, file tax returns, register for tax payments, check account statuses, and monitor accounts in real-time (Waweru 2013).

The administration of domestic taxes can be totally automated and integrated thanks to the web-enabled and secure electronic tax system. It enables taxpayers to register for taxes, file returns, register for payments to expedite tax payments, and check on their status with real-time account monitoring (Ifueko 2011). E-tax systems are described by Chang and Hung (2005) as a way to send tax records and pay taxes owed to the tax authorities using a direct internet connection, typically without the need to present any physical documentation. You can buy a variety of e-filing tax return preparation software packages from websites, tax specialists, reliable software suppliers, or stand-alone programmes.

The administration and collection of taxes are made easier by the introduction of e-taxation (Etin, 2010). Information and communication technologies for automating tax offices have been created using it. Alongside these developments, it has been made possible for taxpayers to electronically submit their statements, computerise the accrual and collection of amounts due for statements, collect information on income, wealth, and expenses electronically, and conduct computer audits of tax returns (Etin, 2010).

Through electronic registration, filing, and payment, the electronic tax system educates and informs taxpayers. The e-tax system, according to Jimenez, Sionnaigh, and Kamenov (2013), is a feature-rich internet portal that can be accessed digitally. It gives taxpayers access to a single source of information, a secure selection of self-service solutions, and it eliminates the need for tax administration experts' help. Clients occasionally require e-taxation services, which are used by the majority of nations (Deman & Klun, 2015). Since there is less likelihood of error because the information on the forms does not need to be manually entered into the computers of IRS staff one form at a time, Harold (2011) claims that electronically submitted computer-generated returns are frequently simpler to complete than paper returns.

E-filing, as described by Chanchal, Vipin, and Vinayak (2013) in their study on taxpayer understanding and satisfaction with online income tax return filing in Moradabad city, is the act of submitting taxes electronically. Long lines for taxpayers to file their forms are no longer an issue. Access to customised forms created by the Tax Authority is made available via the website. Taxpayers do not need to submit any additional paperwork with these forms because they were created with the necessary data.

The procedure calls for both the TIN, a special document number generated on the e-filing platform, and the required internet banking authentication. The technology can produce an electronic receipt that may be shown to the FIRS as proof that the payment was made successfully. According to Slemrod (2012), when designing the ideal tax system, one must take into account how technological advancements may affect both the economic context in which governments seek to raise money and the technology utilised to collect taxes. According to Bird and Zolt (2018), decision-makers should take into account the effect of technical advancements on the creation of specific taxes as well as the relative effectiveness of various tax instruments in generating revenue.

IT thus encompasses all hardware and software for computers, networks, satellite systems, radio, television, mobile phones, and other devices that can store, retrieve, manipulate, transmit, or receive information electronically in a digital form. It also includes a variety of services and applications for videoconferencing and distance learning. Yu (2012) claims that the openness, speed, anonymity, digitization, and worldwide accessibility characteristics of

the internet made it possible for real-time business activities such advertising, querying, sourcing, negotiation auction, ordering, and paying for items.

Over the past six to seven years, the FIRS has implemented a number of technology-based initiatives, and these have been very successful in increasing tax collection, boosting taxpayer confidence in the tax system, improving operational efficiency in the tax department, and reducing leakages (OmoiguiOkauru, 2011). Even in developing nations like Brazil, Chile, and India, where IT is swiftly incorporated into the provision of public services with a consequent influence on society, certain nations, like Nigeria, appear to be moving more slowly towards e-Government practises (Folarin & Olaniyan, 2019).

According to Tomsett (2008), the administration and layout of Tanzania's tax system have been impacted by the usage of IT by tax consultants (firms) and taxpayers. The study's findings also illustrated the numerous advantages of using IT, such as lower administrative and collection costs, fewer staffing needs, taxpayer time savings from expedited processing, collection, transparencyin assessment, and relatedprocesses, lower costs for tax compliance, lower communication costs, and timely information access that prevents revenue losses and enhances productivity and performance.

The money will only end up in the wrong hands and not be collected, regardless of how well the economy has performed. This was the study's finding, notwithstanding the possibility that other economic factors, such as increased domestic trade, a decline in imports, and a greater reliance on homegrown goods, also had a role in the rise in tax income. The findings might not have been the same if this study had been conducted in a different developing nation with a different level of infrastructural development. Although secondary methods were employed in the study, mixed approaches will also be used in the current study on Nigeria. Figure 2 below provides a high-level picture of the FIRS's information technology infrastructure.

The same from governmental bodies is required since ICT technologies and apps allow the private sector to create innovative e-business and e-commerce models that are continually exposed to customers, consumers, and enterprises (Nd). The internet, the rise of digital connection, and the e-business and e-commerce models used by theprivate sectorare forcing thepublic sectorto reevaluate bureaucratic, hierarchicalorganisational structures. ICT use has altered corporate structures, how services are delivered, and how individuals view the usefulness and calibre of information. Tomsett (2008) argues in favour of the notion that taxpayers should be able to easily and effectively use the administration of any recognised taxation system.

The motivations for tax avoidance were investigated by Hai and See (2011). Reviewing the body of literature on the variables influencing sole proprietors' intentions to participate in tax non-compliance conduct was the study's main goal. The report omitted a description of the data collection methodology. The study's conclusions showed that the literature review had been helpful in identifying areas that need further research on unethical intent to violate tax laws. These gaps include unauthorised tax preparers, unauthorised account preparers, and expected potential tax expenses.

But the study did not take into account IT utilisation. According to Liew (2004), many small firms still use unregistered tax preparers. Examining the effect of unlicensed tax preparers on tax non-compliance is advised by Collin *et al*. (1992). Unapproved account preparers are not subject to the conduct standards or tax laws of the recognised accountingboard. Jackson andJones (1985) assert that taxpayers' choices regarding noncompliance may change if they are aware of [the] projected cost of noncompliance. Due to the fact that a taxpayer who wants to avoid paying taxes needs to be aware of the predicted future tax expenditures, tax expenses will be taken into account in the current study.

Adekunle (2012) claims that real-time business activities like advertising, sourcing, querying, negotiating, auctions, ordering, and payment for commodities were made possible by the internet's openness, speed, anonymity, digitization, and worldwide accessibility. Electronic commerce grew as a result. Therefore, a component of information technology is any equipment with the capacity to electronically store, retrieve, alter, transmit, or receive digital information. Satellite systems, radios, televisions, mobile phones, computers, network gear, and a number of services and applications related to distance learning and videoconferencing are some examples of such technologies. In their 2011 study, Adegbile and Fakile, they also looked at the connection between corporate income tax and Nigeria's economic growth. The method employed to get the primary data is not described in this paper. Multiple linear regression analysis and chi-square were used to analyse the study's data. Following the study's completion, the results showed a significant link between Nigeria's economic growth and corporation income tax. There are enough loopholes in this source of income due to evasion and avoidance, as well as taxpayers' contempt for the law and inadequate tax administration, to make them significant obstacles to the collection of tax revenue. The report advocates computerising integrated tax procedures to enhance revenue collection. The study included recommendations for how government organisations may boost the generation and collection of corporate income tax revenue in addition to adding tothe body of knowledge on company income e tax collection.

Methodology

Research Design

The post difference in time design is deemed suitable for the investigation, which is the basis for the employment of quasi-experimental designs. By comparing the average change in the outcome variable over time for the treatment group to the average change over time for the control group, it indicates the impact of a treatment (explanatory variable, independent variable, etc.) on an outcome (response variable, dependent variable, etc.). generates. All FIRS employees in Nigeria would be included because the study focused on Nigerian income taxes for the six (10) years before and after, respectively. This study will only focus on the FIRS's activities relating to tax collection in Nigeria. The main secondary data sources for this study would be the Statistical Bulletin 2022 of the CBN and the planning, reporting, and statistics division of FIRS. For the years 2003 to 2023, statistics will be provided by these sources.

Results and Discussion

In this chapter, the data obtained throughout the course of the study are examined and analysed. It consists of the

presentation and analysis of secondary data obtained from the planning, reporting, and statistics department, the FIRS, and the CBN Statistical Bulletin (2023).

Descriptive Statistics

The descriptive statistics were produced by immediately processing the raw secondary data from table displayed below.

Table 1

Information Technology	Variables	Mean	Std	Min	Max	Skew	Kurt
Pre- Information Technology	VAT	29.802	21.021	131.612	802.68	0.013	0.051
	CGT	8.783	25.041	0.30	80.00	0.000	0.000
	FGR	18.258	14.058	200	4629	0.168	0.571
Post- Information Technology	VAT	11.626	14.607	767	4895	0.0038	0.0210
	CGT	26.219	6.580	2.65	2190	0.0001	0.0005
	FGR	46.604	22.343	10.1	8802	0.7404	0.1903

The aforementioned table also demonstrates that VAT before information technology has a mean of 29.802 and a range of 131.612 to 802.68, with a mean after information technology of 42.625. The VAT was estimated with a minimum of 767 and a maximum of 4.89 billion after accounting for information technology. The data for VAT for before and post are positively skewed, or skewed right, with skewness coefficients of 0.0038 and 0.012, respectively, showing that the majority of the data lie on the left side of the normal curve. The kurtosis coefficients of 0.013 and 0.051, which are explained by that range, demonstrate the data's anomalous distribution.

The capital gain tax has shown that before the introduction of information technology, the lowest amount was 0.30 and the highest was 80, with a mean of 8.783 as contrasted to a mean of 26.219 after it. The capital gain tax was calculated after information technology at a minimum of 2.65 and a maximum of 2.190. The capital gain tax data for pre and post are positively skewed or skewed right, with coefficients of 0.000 and 0.001, respectively, suggesting that the majority of the data lie on the left side of the normal curve. The kurtosis coefficients of 0.000 and 0.005, which are explained by that range, demonstrate the data's anomalous distribution.

Results of the Regression Models

Results of the test for a Significant Difference between pre- and post-information technology tax revenue for the FIRS are shown in this section. The study's underlying assumptions aimed to examine the influence of information technology on tax revenue generated in FIRS by comparing two time periods—before and after information technology.

Analysis of the VAT before and after the introduction of information technology is shown on the Table below.

Table 2

Variable	Coef.	Std. Err.	Std. Dev.	t	P< /t/	Remarks
Pre IT	-5.8856	3.2543	21.021	2.39	0.1450	Not Sig.
Post IT	-0.0508	0.1709	14.607	-0.30	0.7701	

Source: STATA output

The VAT measure used in this extracted model is shown in table above. According to observations, before the introduction of information technology, FIRS's efforts resulted in a 58% pre and 5% post decrease in VAT to revenue earned, but these decreases were not statistically significant at either time. For the pre-adoption of IT period, the coefficient of -5.88 shows that for every 1 increase realised by FIRS, VAT will reduce by about 58, whereas for every 1 rise realised by FIRS, VAT will also decrease by approximately 5. for after adoption. This demonstrates that there was no statistically significant variation in the VAT between the time before and after the adoption of information technology. The P /t/ in the table indicates that the firm income tax following the deployment of information technology was statistically significant during the adoption of information technology. Thus, the null hypothesis is refuted. This shows that the use of information technology has greatly enhanced the amount of taxes collected in Nigeria.

VAT has increased as a result of the usage of IT, and this increase is likely due to the increased long-term comfort of taxpayers. The adoption suggests that FIRS were able to increase tax collections as a result of the adoption since both people and corporate organisations find it convenient to pay from their comfort zones. The results are in line with Githinji's (2020) analysis of how information technology (IT) affects Kenyan counties' capacity to collect taxes. Descriptive statistics and econometric models, such as the Jacque Berra test andthe AugmentedDickey Fullertest, were utilised to analyse the study's data. They found that Kenya's income tax was noticeably influenced favourably by factors impacting tax revenue, such as value-added tax. They came to the conclusion that Kenya's capacity to collect taxes had improved thanks to information technology.

A test of the capital gain tax's considerable variation before and after the use of information technology is shown on the table below.

Table 3

Variable	Coef.	Std. Err.	Std. Dev.	t	P</t/	Remarks
Pre IT	3.732	16.7842	25.041	0.22	0.8350	Sig.
Post IT	5.7661	1.5034	65.806	3.84	0.0120	

Source: STATA output

The table illustrates the model and test of a significant difference in income tax before and after the adoption of information technology. Observations show that prior to the introduction of IT, CGT to income generated increased by 4% before and 6% after its implementation, however neither rise was statistically significant. The 4% coefficient states that for every $1 increase in FIRS realised prior to the adoption of IT, CGT will contribute roughly $4, and for every $1 increase realised following the adoption, CGT will increase by roughly $6. This implies that the capital gains tax before and after the adoption of information technology differed significantly.

According to the P/t in the table, the capital gain tax following the deployment of information technology was statistically significant after the adoption of information technology. Therefore, the null hypothesis is accepted. This shows that with the advent of information technology, the capital gains tax has greatly increased in Nigeria's revenue.
Following the use of IT, tax revenue increased unquestionably due to the improved consistency of taxpayer experience. Adoption suggests that FIRS was able to boost tax collections as a result of the adoption.
This result matched Akman's (2019) conclusions that IT is to blame for the effects of changes in capital gain tax from the time of the adoption of e-services and the present. For Alabede's (2021) research on the impact of information technology on taxation, data for the years 2011 through 2020 were acquired fromthe StatisticalBulletin of the CBN. To analyse their findings, they used time series data, an expo facto design, and regression. They found that capital gain tax as a variable had a significant positive impact on tax income in Nigeria, especially after the deployment of IT. They came to the conclusion that, particularly after its implementation, information technology increased revenue collection in Nigeria.

Findings Synthesis

i. With correlation coefficients of -5.8856 and 0.1450 at the 5% level of significance, VAT and income tax had a considerable positive impact but a negative association prior to the adoption of information technology. This indicates that income tax and VAT have a negative correlation, but it is not statistically significant. The VAT in Nigeria had a negative influence on tax revenue, according to post-correlation analysis after the introduction of IT, which found a negative correlation with coefficients of 0.0508 and 0.7701 at the 5% level of insignificance.

ii. The correlation coefficients between capital gains tax and income tax were 3.7320 and 0.8350 at the 5% level of significance, respectively, before the development of information technology, indicating that CGT is not statistically significant but positively affects income tax. Following the implementation of IT, post-correlation study showed a favourable correlation with a coefficient of 5.7661 and a significance level of 0.0120, demonstrating that CGT had a significant and favourable impact on Nigeria's income tax.

Conclusion and Recommendations

After critical analysis, this work findings led to the conclusion that, despite claim that information technology has a positive and negative connection with valued added tax (VAT) was stated in earlier studies by Abdalla (2019) and Adefila and Soluji (2020), using the FIRS as a simple measure in Nigeria. This study has now supported that claim. The findings continued by stating that corporation income tax made a sizeable and favourable contribution to the tax revenue obtained by the FIRS of Nigeria. Additionally, through the usage of VAT, federal inland revenue in Nigeria significantly and favourably contributed to tax income throughout the time period after the implementation of IT. The government must continue to maintain the platform because it currently plays a significant and useful role, allowing tax payers to become accustomed to it. By doing this, the FIRS will be able to raise more revenue and accomplish their objectives. Despite the fact that stamp duty probably brought in money for the government, it failed to achieve the 5% level of significance, indicating that it had little impact on the study.
Based on its results and recommendations, the study made the following recommendations:

i. Taxpayers ought to be able to tell where their money is going thanks to the government's and the FIRS's efficient use of resources (tax collection). Improved taxpayer services and stricter enforcement would both increase compliance. According to Ogungbesan (2019), many Nigerians refused to pay taxes because they thought the government was not using their money to effectively provide and improve services.

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