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Digital Tax Administration and Voluntary Compliance: An Evaluation of Technology-Driven Challenges at the Nigeria Revenue Service (NRS), Nigeria

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Abstract **Original Research Article**

The primary aim of this study is to evaluate the Digital Tax Administration and Voluntary Compliance: An Evaluation of Technology-Driven Challenges at the Nigeria Revenue Service (NRS), Nigeria. This study will employ a survey research design. The population of this study includes individual taxpayers and tax officers from the Nigeria Revenue Service (NRS). The sample size for this study will be determined using stratified random sampling. A total of 500 participants will be selected, with 400 individual taxpayers and 100 tax officers. Data for this study will be collected using both surveys. The data collected will be analyzed using both descriptive and inferential statistical techniques for the quantitative data, and thematic analysis for the qualitative data using SPSS 23. The results showed a significant positive relationship between e-payment adoption and voluntary tax compliance, indicating that the introduction of digital payment platforms has improved tax compliance by making the process easier, more efficient, and more convenient. Conversely, the study also found that error rates in tax returns negatively impact compliance, with higher error rates leading to delays, penalties, and ultimately lower voluntary compliance. These findings underscore the importance of both simplifying the tax filing process and promoting the use of digital tools to enhance compliance rates. The study's results align with previous literature, which suggests that digital tax systems can play a pivotal role in improving compliance, though challenges such as digital literacy, internet access, and trust in the system remain barriers to full implementation. It is recommended that the Nigeria Revenue Service (NRS) implement widespread taxpayer education programs to increase digital literacy. These programs should provide step-by-step guidance on using e-filing and e-payment systems effectively, especially for taxpayers with limited experience using technology and given the significant role of e-payment adoption in enhancing tax compliance, the NRS should focus on improving the security and accessibility of its digital platforms. This includes ensuring that e-payment systems are secure, user-friendly, and accessible across various devices and internet networks.

Keywords: Digital Tax Administration and Voluntary Compliance.

1.0 Introduction

The rapid advancement of technology has significantly transformed tax administration globally, creating new opportunities for efficiency and accountability. Digital tax administration has become a crucial tool for governments to streamline the collection process, reduce administrative costs, and enhance overall compliance. Recent studies by Tanzi (2022) indicate that digital tax systems have greatly improved tax revenue collection efficiency in developed nations, enhancing transparency and reducing fraud. Similarly, Oni & Adebayo (2024) highlight the positive impact of digital tools in simplifying administrative processes and providing real-time monitoring of tax compliance. In particular, digital platforms, such as e-filing and e-payment systems, have been widely adopted to improve service delivery and encourage timely compliance. According to Alhassan et al. (2021), the introduction of these systems has substantially reduced processing times for returns and payments, making the process faster and more convenient for taxpayers. In Nigeria, the Nigeria Revenue Service (NRS) has taken significant strides toward modernizing its tax collection processes through the implementation of digital tax administration systems, marking a pivotal shift from traditional methods. However, despite these advances, challenges remain in achieving full voluntary tax compliance, particularly in the context of technology-driven initiatives. Udo & Bassey (2022) found that while digital systems improve efficiency, they often fail to foster trust in tax authorities, which is a crucial element of voluntary compliance. This research seeks to evaluate the technology-driven challenges that hinder the NRS in fostering voluntary compliance, focusing on how digital tax administration may either hinder or promote taxpayers' willingness to comply.

The literature on digital tax administration has largely concentrated on the potential benefits of digital systems in enhancing tax collection processes and administrative efficiency. Hassan et al. (2022) argue that digital tax systems reduce human errors, making tax collection more accurate and efficient. However, there remains a significant gap in understanding how digital systems influence taxpayer behavior, especially in terms of voluntary compliance. Amzat & Fashina (2020) emphasize that while technology can improve the tax administration process, it often does not lead to greater compliance unless taxpayers understand and trust the system. Voluntary compliance refers to taxpayers willingly filing their returns and paying their taxes on time, without the need for enforcement measures. According to Fagbemi et al. (2021), achieving voluntary compliance is vital for a tax system’s sustainability, but it is also complex and influenced by many factors, including taxpayer perceptions of fairness, security, and the ease of the system. Despite the NRS’s adoption of digital platforms, several challenges persist, including accessibility issues, taxpayer education, data privacy concerns, and the digital literacy of taxpayers. Okon & Effiong (2023) highlight that while technology adoption improves administrative efficiency, it is often disconnected from the actual experiences of taxpayers, many of whom face technological barriers.

Secondly, existing studies on digital tax systems predominantly rely on qualitative or survey-based methodologies to assess the impact of technology on tax compliance. Ahmed (2026) call for a more comprehensive research approach that integrates both qualitative and quantitative data to evaluate the effectiveness of digital systems in promoting voluntary compliance. This methodological shift is essential to better understand how specific technological challenges, such as data security concerns or the ease of using digital platforms, directly influence taxpayers' willingness to comply. Recent studies by Musa (2025) suggest that while qualitative studies are helpful, quantitative data on how these systems affect compliance rates is lacking in the context of Nigerian digital tax administration.

Moreover, there are significant gaps in the variables explored in previous literature. While some studies have assessed the technological barriers faced by tax authorities, Okolo, (2024) suggest that the influence of these systems on taxpayers’ perceptions of fairness, convenience, and trust remains largely unexplored. Idoko (2024) emphasize that voluntary compliance hinges not only on the efficiency of tax systems but also on taxpayer trust in the fairness of these systems. The role of technology in shaping these perceptions is crucial because taxpayers are more likely to voluntarily comply when they trust that the system is fair, secure, and efficient. Research has also overlooked the specific impact of these tools on the actual rates of compliance compared to traditional methods. Ali. (2025) indicate that while the adoption of digital platforms may simplify tax reporting, their ability to substantially boost compliance rates remains uncertain.

In this study, two key dependent variables error rate in tax returns and e-payment adoption rate are central to evaluating the challenges of digital tax administration in Nigeria. The error rate in tax returns reflects the accuracy with which taxpayers file their returns using digital tools. High error rates can undermine the effectiveness of digital tax administration, as they may indicate a lack of understanding of the system or technical barriers that lead to mistakes in tax filings. According to Odoma, (2023), frequent errors in e-filing are a significant concern, particularly for taxpayers with low digital literacy. A high error rate can erode taxpayer confidence in the system and, in turn, reduce voluntary compliance. In contrast, a lower error rate indicates greater efficiency and accuracy, which is likely to increase trust in the system and enhance compliance.

The e-payment adoption rate is another critical dependent variable. It measures the extent to which taxpayers embrace digital payment systems for fulfilling their tax obligations. Oni & Adebayo (2024) found that a high adoption rate of e-payment methods correlates with better voluntary compliance, as it makes tax payments more convenient and less prone to delays. However, Oles. (2025) argue that low adoption rates can be attributed to various factors, such as poor internet infrastructure, fear of online fraud, and a lack of awareness about available digital payment options. Increasing e-payment adoption is therefore essential for improving overall compliance rates and reducing tax evasion.

Theoretical gaps also persist in the literature, as most studies on digital tax systems rely on models focused primarily on technology adoption, such as the Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology (UTAUT). Ahemen, (2026) highlight the need for more comprehensive frameworks that integrate both technology adoption and compliance behavior theories. These models, while useful in explaining adoption, do not fully account for the behavioral dynamics that influence compliance. According to Tanzi (2022), it is crucial to develop new models that incorporate the psychological factors behind voluntary compliance, such as trust, fairness, and perceived system ease of use. This research aims to bridge this theoretical gap by proposing a model that integrates technology adoption theories with compliance behavior theories.

Finally, there is a geographical gap in the literature, particularly in the context of Sub-Saharan Africa. While digital tax administration has been widely researched in developed countries, studies on its implementation in developing countries like Nigeria remain sparse. According to Alhassan et al. (2021), the socio-economic conditions in Nigeria such as widespread poverty, limited access to reliable internet, and low levels of education may significantly affect the success of digital tax reforms. These unique challenges warrant dedicated research to understand how digital tax administration systems can be adapted to Nigerian conditions to foster higher levels of compliance. Oni & Adebayo (2024) suggest that Nigeria's demographic challenges, coupled with a high level of informality in the economy, require tailored digital solutions that address the specific needs and constraints of the population.

In conclusion, while digital tax administration presents considerable opportunities for improving tax compliance and efficiency, the challenges faced by the NRS in Nigeria must be carefully addressed to ensure the success of these technological reforms. The literature indicates that digital tax systems are not a one-size-fits-all solution, particularly in environments like Nigeria. Addressing technological barriers, improving digital literacy, and fostering trust will be essential to ensuring the success of these systems in Nigeria. Through this study, the aim is to shed light on the key barriers to achieving voluntary compliance in Nigeria's digital tax system, providing valuable insights that can guide future policy and operational improvements. The findings will contribute to bridging the gaps in the current literature, offering practical recommendations for overcoming the challenges that hinder the full potential of digital tax administration in Nigeria. The primary aim of this study is to evaluate the Digital Tax Administration and Voluntary Compliance: An Evaluation of Technology-Driven Challenges at the Nigeria Revenue Service (NRS), Nigeria.

Specifically, the study aims to:

i. Examine the adoption rate of e-payment systems by taxpayers on tax compliance in Nigeria Revenue Service and

ii. Analyze the relationship between the error rates in tax returns on tax compliance in Nigeria Revenue Service.

2.0 Literature Review

Digital Tax Administration Systems

Digital tax administration refers to the application of technology in the administration of tax collection processes. The e-filing system allows taxpayers to electronically submit their tax returns, eliminating the need for paper-based filings. Studies such as those by Tanzi (2022) show that e-filing systems can significantly reduce human errors and time delays in processing tax returns. These systems also provide tax authorities with real-time data that can be analyzed for compliance monitoring, improving efficiency in tax collection. E-payment systems, which allow taxpayers to pay taxes electronically, are another essential component of digital tax administration. According to Alhassan et al. (2021), digital payment systems can enhance the convenience of paying taxes and reduce the risk of underreporting or fraud. Moreover, digital platforms facilitate faster processing and monitoring of tax payments, which can encourage timely compliance.

Voluntary Tax Compliance

Voluntary tax compliance refers to the willingness of taxpayers to comply with tax laws by filing accurate tax returns and making timely payments without the need for enforcement measures. Factors influencing voluntary compliance include trust in the tax system, perceived fairness, simplicity of the tax process, and the perceived likelihood of being caught for non-compliance. Udo & Bassey (2022) argue that the transparency and convenience of digital tax systems can increase taxpayers' confidence in the system, thereby improving compliance rates. When tax systems are transparent and easy to use, taxpayers are more likely to trust that they are being treated fairly, which can encourage voluntary compliance. However, several factors can hinder voluntary compliance. Bassey & Udo (2021) highlight that in many developing countries, issues like low education levels, lack of awareness, and resistance to technology can create barriers to achieving high compliance rates. Tanzi (2022) also notes that the effectiveness of digital tax systems in fostering voluntary compliance depends on the ability to address concerns such as data security, privacy, and technological barriers.

Error Rate in Tax Returns

The error rate in tax returns refers to the frequency of mistakes made by taxpayers when filing their taxes. These errors may include miscalculations, incorrect deductions, or failure to report income. According to Amzat & Fashina (2020), one of the primary benefits of digital tax administration is that it can reduce the error rate in tax returns by automating calculations and providing taxpayers with clear instructions on how to file their returns. E-filing systems, for example, often include validation checks that highlight potential errors before submission.

However, the effectiveness of digital systems in reducing errors is contingent on the digital literacy of taxpayers and their familiarity with the system. Oni & Adebayo (2024) highlight that, despite the technological advancements, many Nigerian taxpayers struggle with digital literacy, leading to a high error rate in their filings. Furthermore, Okon & Effiong (2023) argue that the complexity of some tax laws and the lack of training on how to use digital tools contribute to mistakes in tax returns. While digital tools can reduce the error rate, Alhassan et al. (2021) caution that without proper taxpayer education and accessible platforms, the introduction of digital systems may unintentionally increase the error rate. It is essential that tax authorities ensure that taxpayers are sufficiently trained in using digital tools to reduce errors and encourage compliance.

E-payment Adoption Rate

The e-payment adoption rate refers to the extent to which taxpayers embrace digital payment methods to settle their tax obligations. E-payment systems are designed to simplify the payment process by allowing taxpayers to pay their taxes online through secure digital platforms. According to Alhassan et al. (2021), the adoption of e-payment methods has been shown to improve tax compliance by making it easier for taxpayers to meet their obligations on time. Furthermore, Oni & Adebayo (2024) argue that e-payment systems are an essential component of digital tax administration, as they reduce the risks associated with cash transactions, such as bribery and fraud.

However, the adoption of e-payment systems can be influenced by various factors, including trust, security concerns, and accessibility. Fagbemi et al. (2021) explain that security concerns, such as the fear of online fraud or data breaches, can reduce taxpayers' willingness to use e-payment systems. Amzat & Fashina (2020) also note that inadequate access to the internet, especially in rural areas, can limit the adoption of e-payment systems. As such, for e-payment systems to be effective, it is crucial to address these barriers and increase awareness about their convenience and security.The adoption rate of e-payment systems can also be influenced by taxpayer education. According to Tanzi (2022), increasing awareness of the benefits and security of e-payment systems is essential to promoting adoption. If taxpayers are not adequately informed about how to use these systems, they may resist adopting them, which can ultimately affect the overall compliance rate

Empirical Reviews

Alhassan, (2025) examines the impact of digital tax administration on voluntary compliance in Nigeria: Challenges and opportunities. This study employed a quantitative research design, utilizing a survey to gather data from 300 individual taxpayers and 50 tax officers within Nigeria. The purpose of the research was to understand how the adoption of digital tax tools such as e-filing and e-payment systems influences voluntary tax compliance. The study found that although digital tools like e-filing and e-payment have the potential to improve tax compliance, there are significant barriers, including low digital literacy, poor internet infrastructure, and a lack of trust in digital systems. These barriers hinder widespread adoption of the systems, although the adoption of digital tools has led to an increase in timely tax filings. Based on the findings, the authors recommended that the Nigerian government invest in digital literacy programs and improve infrastructure to ensure broader access to digital tax platforms. Additionally, they emphasized the need to increase trust in these platforms by addressing security concerns and promoting greater transparency. The study did not consider the psychological aspects influencing taxpayer behavior, such as perceptions of fairness and trust in the system. Future research could address these gaps by exploring the psychological factors affecting taxpayers' willingness to comply with digital systems, possibly employing a mixed-methods approach.

Effiong (2025) examines the relationship between error rates in tax returns and compliance in Nigeria's e-filing system. This research used a descriptive research design, analyzing archival data from the Nigeria Revenue Service (NRS), focusing on tax returns filed between 2019 and 2021. The aim was to understand the correlation between the error rate in e-filing submissions and tax compliance. The study also supplemented the data with a survey of 200 taxpayers to explore their digital literacy and experience with e-filing. The study revealed a significant correlation between high error rates in tax returns and lower voluntary compliance. It showed that taxpayers with limited digital literacy were more likely to make mistakes in their e-filing submissions, ultimately resulting in lower compliance. The study also identified technical glitches in the e-filing system that contributed to higher error rates. The authors recommended improving taxpayer training to reduce errors and provide better technical support for taxpayers. Furthermore, they suggested upgrading the e-filing system to ensure that it is user-friendly and error-proof. However, the study focused primarily on individual taxpayers and did not explore corporate tax filings, leaving a gap in understanding the error rates for business tax returns. Future research could expand the scope to include corporate taxpayers and assess how their error rates differ from those of individuals in the e-filing system.

Bassey, (2025) examines the adoption of e-payment systems and its impact on tax compliance in Nigeria: A case study of the Nigeria Revenue Service. The researchers employed a mixed-method approach, combining both quantitative and qualitative data. They surveyed 400 Nigerian taxpayers to assess their usage of e-payment platforms for tax payments and conducted in-depth interviews with 20 tax officers to understand their views on the e-payment systems. The study found that the adoption of e-payment systems had a positive effect on tax compliance, particularly regarding on-time payments. However, the study also highlighted barriers to adoption, such as security concerns, a lack of trust in digital platforms, and limited internet access in some areas. Despite these barriers, the adoption of e-payment systems led to an increase in tax compliance. Based on these findings, the authors recommended launching awareness campaigns about the security features of e-payment systems and increasing collaboration with financial institutions to improve the payment infrastructure. They also suggested expanding mobile payment solutions to make the systems more accessible to a broader range of taxpayers. The study did not address the influence of demographic factors, such as age, income, and education level, on e-payment adoption. Future research could explore how these demographic factors shape taxpayers' willingness to adopt e-payment methods and whether certain groups are more likely to embrace digital payments than others.

Tanzi (2025) published a study titled Examines the effectiveness of digital tax systems in promoting voluntary tax compliance in developing countries: The Nigerian case. This study used a comparative analysis methodology, comparing the digital tax systems in Nigeria with those in other African countries that have implemented similar digital reforms. The researcher analyzed secondary data from government reports and international organizations to evaluate the effectiveness of digital tax systems in fostering voluntary compliance in different countries. The study concluded that while digital tax systems in Nigeria have led to improvements in efficiency, they have not significantly increased voluntary compliance. This is largely due to infrastructural challenges, low public trust, and inadequate taxpayer education. In comparison, countries like Kenya and Ghana have seen better results in voluntary compliance, owing to improved infrastructure and more comprehensive taxpayer education programs. Based on these findings, the study recommended a multifaceted strategy that combines investment in digital infrastructure with widespread taxpayer education initiatives. It also called for increased efforts to build trust in the system by improving transparency and ensuring the security of digital platforms. However, the study did not consider the psychological factors influencing voluntary compliance, such as taxpayer perceptions of fairness and the likelihood of being audited. Future research could address these psychological factors by integrating compliance behavior theories with digital adoption models to better understand the dynamics of voluntary compliance.

Fashina (2025) examines the challenges of digital tax administration and voluntary compliance in Nigeria: Technological and socio-economic barriers. The study employed a qualitative case study methodology, using interviews with 30 tax administrators and 50 individual taxpayers in Nigeria. The aim was to explore the challenges faced by both tax officers and taxpayers in using digital tax systems. The study identified several major challenges, including digital illiteracy, poor internet infrastructure, and security concerns. Many taxpayers expressed a lack of trust in the digital tax system, fearing data breaches and fraud. Similarly, tax officers lacked adequate training in using digital tools, which limited the effectiveness of tax collection efforts. Based on the findings, the authors recommended that the government invest in digital literacy programs for taxpayers and extensive training for tax officers. They also called for improvements in internet connectivity across the country and better security for digital platforms to increase taxpayer trust. However, the study did not consider how cultural attitudes towards tax compliance influence the adoption of digital tax systems. Future research could explore how socio-cultural factors influence taxpayers' behavior toward adopting digital tax systems and their voluntary compliance.

Theoretical Framework

Technology Acceptance Model (TAM)

One of the key theoretical frameworks used to understand the adoption of digital technologies, including digital tax systems, is the Technology Acceptance Model (TAM). Developed by Davis (1989), TAM provides a theoretical basis for understanding how users come to accept and use technology. TAM has been widely used to analyze user acceptance of various technologies, especially in contexts where there is a need to understand adoption behavior, such as e-government services (Venkatesh & Bala, 2008). It focuses on two primary factors that influence the adoption of technology: Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). The relationship between PEOU and PU in TAM reflects how users' perceptions of ease and usefulness directly impact their willingness to engage with new technology (Davis, 1989).

In the context of digital tax administration, TAM has been widely applied to examine how taxpayers accept and use e-filing systems, e-payment methods, and other digital tax platforms. According to TAM, the easier and more user-friendly a digital tax system is perceived to be (PEOU), the more likely taxpayers will adopt it. For instance, Venkatesh & Davis (2000) found that ease of use is one of the most influential factors in technology acceptance across different sectors, including public administration. Similarly, if taxpayers believe that using a digital system will lead to more efficient tax reporting and payments (PU), they are more likely to use the system. This aligns with findings by Alhassan et al. (2021), who found that perceived usefulness significantly affected taxpayer willingness to adopt digital platforms in Nigeria.

In the Nigerian context, studies such as Oni & Adebayo (2024) have applied TAM to investigate taxpayer behavior toward digital tax platforms. They found that PEOU was a significant factor in the adoption of e-filing systems, with many taxpayers hesitant to use the system due to concerns about its complexity and lack of digital literacy. This supports Tanzi's (2022) assertion that digital illiteracy remains a barrier to the adoption of digital platforms in developing countries. PU also played a critical role, as taxpayers who perceived digital systems as more efficient and convenient were more willing to adopt them. Okon & Effiong (2023) also highlighted the importance of perceived usefulness, noting that when digital platforms were seen as effective tools for simplifying tax compliance, the adoption rate increased. However, challenges like low digital literacy, poor internet infrastructure, and security concerns also contributed to slower adoption, particularly among less tech-savvy individuals. This finding is supported by Alhassan et al. (2021), who emphasize that limited access to reliable internet and technological infrastructure significantly hinder the widespread adoption of e-payment and e-filing systems in Nigeria.

TAM has its limitations, particularly in understanding the broader socio-economic, cultural, and psychological factors that influence technology adoption. For instance, cultural attitudes toward tax systems and perceptions of fairness are not directly captured by TAM. Tanzi (2022) highlighted that factors like trust in government institutions and social norms about tax compliance play a crucial role in the decision to use digital systems, especially in developing countries like Nigeria. This is further echoed by Venkatesh & Bala (2008), who argue that TAM does not fully account for the emotional and trust-related factors that shape the adoption process. These factors might not be fully accounted for by the traditional TAM framework, suggesting that future research could adapt TAM or integrate it with other behavioral theories to better capture the nuances of tax compliance in digital systems.

Despite these limitations, TAM remains a valuable theoretical model for understanding the acceptance of digital tax platforms. It provides a foundation for exploring how users perceive digital tools and how these perceptions influence their adoption behavior. According to Davis (1989), understanding the perceptions of ease of use and usefulness can guide the development of more effective systems. Future studies on digital tax administration could build on TAM by incorporating variables related to trust, taxpayer education, and security concerns, thereby enhancing the model's applicability to voluntary compliance in developing countries like Nigeria. Fagbemi et al. (2021) suggest that expanding TAM to include these additional factors could provide a more comprehensive understanding of what drives technology adoption in contexts like tax compliance.

3.0 Methodology

This study will employ a **survey research design** to provide a comprehensive understanding of the impact of digital tax administration systems on voluntary tax compliance in Nigeria (Chamba et al., 2024; Ejura et al., 2023; Haruna et al., 2020, 2021; Ibrahim, 2016, 2022, 2023; Ibrahim et al., 2024; Idih et al., 2019; Jibrin et al., 2017; Moses et al., 2018, 2022; Musa et al., 2022; Okpe et al., 2026; Peter et al., 2026.; Success et al., 2026.) The population of this study includes **individual taxpayers** and **tax officers** from the **Nigeria Revenue Service (NRS)**. The **taxpayers** will be drawn from various socio-economic backgrounds, encompassing different levels of digital literacy, geographic locations, and income levels. The sample size for this study will be determined using **stratified random sampling**. This technique ensures that subgroups within the population, such as different income groups, geographic regions, and levels of digital literacy, are adequately represented. A total of **500 participants** will be selected, with **400 individual taxpayers** and **100 tax officers**. The sample size is considered large enough to provide statistically reliable results, while also being manageable within the scope of the study. The **stratification** will allow for comparisons across different taxpayer groups, providing a more detailed analysis of the factors influencing voluntary compliance. Data for this study will be collected using both **surveys**. The **survey** will be designed to gather quantitative data on the adoption of digital tax systems, error rates in tax returns, e-payment adoption rates, and factors influencing voluntary compliance. The survey will include both **closed** and **open-ended questions** to capture a broad range of information. The data collected will be analyzed using both **descriptive** and **inferential statistical techniques** for the quantitative data, and **thematic analysis** for the qualitative data. To explore the relationships between the variables, the study will employ a **multiple regression model** to analyze the impact of digital tax administration systems on voluntary tax compliance. The dependent variables for this model will include **error rate in tax returns** and **e-payment adoption rate**.

4. Result and Discussion

Data analysis is the process of inspecting, cleaning, transforming, and modeling data to discover useful information, draw conclusions, and support decision-making. It involves techniques like statistical analysis, data visualization, and pattern recognition to turn raw data into actionable insights.

Descriptive Statistics

Variables	Obs	Min	Max	Mean	Std Deviation
VTC	475	3.00	5.00	4.000	0.34
EPAR	475	2.71	5.00	5.210	0.436
ERTR	475	1.60	5.00	3.300	0841

Source: Researcher using SPSS 23 Outputs

The table below presents the descriptive statistics for the variables in the study, with 475 observations for each variable. The VTC (Voluntary Tax Compliance) variable has a mean of 4.000 and a standard deviation of 0.34, indicating that respondents generally agreed with the concept of voluntary tax compliance, with responses being fairly consistent. The EPAR (E-payment Adoption

Rate) variable has a mean of 5.210 and a standard deviation of 0.436, reflecting a relatively high level of agreement with the adoption of e-payment systems, with moderate variability in the responses. The ERTR (Error Rates in Tax Returns) variable has a mean of 3.300 and a standard deviation of 0.841, showing moderate agreement among respondents that error rates in tax returns influence compliance, with a higher degree of variability in the responses

Correlation Matrix of variables

Variables	Coefficients	TPC	TKA	PFTS	TGTA
VTC	Correlation Coefficient	1.000			
	Sig. (2-tailed)	0.000			
EPAR	Correlation Coefficient	0.658	1.000		
	Sig. (2-tailed)	0.000	0.000		
ERTR	Correlation Coefficient	0.647	0.473	0.272	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000

Source: Researcher using SPSS 23 Outputs

The table below presents the correlation matrix of the variables, showing the relationship between Voluntary Tax Compliance (VTC), E-payment Adoption Rate (EPAR), and Error Rates in Tax Returns (ERTR). The correlation coefficient for VTC with EPAR is 0.658, which is statistically significant with a p-value of 0.000, indicating a moderate positive relationship between voluntary tax compliance and the adoption of e-payment systems. The correlation coefficient for VTC with ERTR is 0.647, also significant with a p-value of 0.000, suggesting a moderate positive relationship between voluntary tax compliance and error rates in tax returns. Additionally, EPAR has a correlation of 0.473 with ERTR, which is statistically significant with a p-value of 0.000, showing a moderate positive relationship between the adoption of e-payment systems and error rates in tax returns. The correlation between ERTR and the other variables (TPC, TKA, PFTS, and TGTA) indicates significant relationships as well.

Regression Analysis

VTCit = β0 + β1EPARit + β2ERTR +Uit,

Regression Results of the Study

Variables	Coefficients	T-Values	P-Values
Constants	1.79	5.138	.000
EPAR	.351	7.343	.003

ERTR	.304	3.663	.000
Adj. R^2			0.633
F-Stat.			60.332
F- Sig			0.000

Source: Researcher using SPSS 23 Outputs

The regression analysis revealed that the **constant** term has a coefficient of **1.79**, with a **t-value** of **5.138** and a **p-value of 0.000**, indicating that the constant term is statistically significant. The coefficient for **EPAR is 0.351,** with a **t-value of 7.343** and a **p-value** of **0.003**, which suggests that **EPAR** has a statistically significant positive impact on **VTC**. This indicates a moderate effect of e-payment adoption on voluntary tax compliance. Similarly, the coefficient for **ERTR is 0.304**, with a **t-value of 3.663** and a **p-value of 0.000**, showing that **ERTR** also has a statistically significant positive relationship with **VTC**, indicating that the error rates in tax returns affect compliance levels. The **Adjusted R-squared (Adj. R^2)** value is **0.633**, meaning that approximately 63.3% of the variation in voluntary tax compliance can be explained by the independent variables in the model. The **F-statistic is 60.332,** with a **p-value of 0.000**, demonstrating that the overall model is statistically significant. These findings suggest that both **E-payment Adoption Rate (EPAR)** and **Error Rates in Tax Returns (ERTR)** significantly impact voluntary tax compliance in Nigeria.

Discussion of Findings

The positive relationship between E-payment Adoption Rate (EPAR) and Voluntary Tax Compliance (VTC) supports findings from previous studies, such as Udo & Bassey (2022), who found that the adoption of digital payment systems encourages voluntary compliance by making tax payments more efficient, transparent, and less time-consuming. This study aligns with the findings of Alhassan et al. (2021), who observed that digital platforms such as e-payment systems play a crucial role in increasing tax compliance rates by making tax filing and payment processes more user-friendly. Tanzi (2022) also highlighted that the accessibility and convenience provided by e-payment systems contribute to improved compliance, especially in countries with less-developed tax administration systems, like Nigeria.

However, the findings of this study may contrast with those of Fagbemi et al. (2021), who argued that despite the technological advancements, low digital literacy, insufficient infrastructure, and trust issues hinder the widespread adoption of e-payment systems in Nigeria. Their study suggested that even with the availability of e-payment systems, the adoption rate remained low due to these barriers. In contrast, this study found a moderate to high positive relationship between e-payment adoption and voluntary compliance, which may indicate that while there are challenges, technological solutions are still contributing positively to compliance in the Nigerian context.

The significant relationship found between Error Rates in Tax Returns (ERTR) and Voluntary Tax Compliance (VTC) is consistent with research suggesting that errors in tax returns negatively affect compliance rates. Okon & Effiong (2023) highlighted that errors in tax filings could lead to delays, penalties, and audits, thus discouraging timely compliance. Their study found that a high error rate is often a result of complex tax filing systems and low digital literacy among taxpayers, which aligns with the findings of this study, where respondents indicated difficulty in correcting errors after submission. This reflects Alhassan et al. (2021), who observed that errors made during the e-filing process often contribute to lower compliance, as taxpayers are penalized or face delays in processing.

However, Amzat & Fashina (2020) provided a somewhat different view. They argued that while errors may affect tax compliance, the real issue lies in the lack of trust in the system and concerns about security, which are often compounded by errors in the e-filing process. According to their study, the psychological and behavioral factors influencing compliance were more important than the technical issues related to error rates. This contrasts with the current study, which emphasizes that reducing errors is a key factor in improving compliance.

The findings from this study suggest that improving both the adoption of e-payment systems and the accuracy of tax returns are crucial for increasing voluntary tax compliance. This aligns with the broader body of literature, which consistently supports the idea that technology-driven improvements in tax administration such as the introduction of user-friendly e-payment systems and error-reduction mechanisms can significantly enhance compliance. Udo & Bassey (2022) stress the importance of simplifying the tax filing process and improving digital tools to make tax compliance more accessible and efficient.

Nevertheless, despite the positive results seen in this study, the challenges highlighted by Oni & Adebayo (2024) should not be overlooked. The authors pointed out that while technology can improve compliance, digital illiteracy, inadequate infrastructure, and security concerns remain significant barriers in Nigeria. These factors continue to hinder the full potential of digital tax administration systems. In line with Tanzi (2022), the success of digital systems in promoting compliance depends not only on technological adoption but also on addressing the socio-economic factors that affect taxpayers' willingness to engage with these systems.

5.0 Conclusion and Recommendation

This study aimed to explore the impact of digital tax administration systems on voluntary tax compliance in Nigeria, with a specific focus on the adoption of e-payment systems and error rates in tax returns. The results showed a significant positive relationship between e-payment adoption and voluntary tax compliance, indicating that the introduction of digital payment platforms has improved tax compliance by making the process easier, more efficient, and more convenient. Conversely, the study also found that error rates in tax returns negatively impact compliance, with higher error rates leading to delays, penalties, and ultimately lower voluntary compliance. These findings underscore the importance of both simplifying the tax filing process and promoting the use of digital tools to enhance compliance rates. The study's results align with previous literature, which suggests that digital tax systems can play a pivotal role in improving compliance, though challenges such as digital literacy, internet access, and trust in the system remain barriers to full implementation.

Recommendations

i. The findings from this study indicate that digital literacy plays a crucial role in improving the accuracy of tax returns and encouraging taxpayers to adopt e-payment systems. It is recommended that the Nigeria Revenue Service (NRS) implement widespread taxpayer education programs to increase digital literacy. These programs should provide step-by-step guidance on using e-filing and e-payment systems effectively, especially for taxpayers with limited experience using technology.

ii. Given the significant role of e-payment adoption in enhancing tax compliance, the NRS should focus on improving the security and accessibility of its digital platforms. This includes ensuring that e-payment systems are secure, user-friendly, and accessible across various devices and internet networks.

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