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The Perception of Nigerian Tax Officers, Taxpayers, and Tax Consultants on the Adoption of Artificial Intelligence in Tax Risk Management

Adeola Temitope Aina

Department of Accounting, UNICAF University, Malawi
Correspondence Email : topeaina@gmail.com

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Abstract

The Nigerian tax system faces substantial hurdles, including tax evasion, avoidance, and non-compliance, resulting in significant revenue losses. To combat these problems, this study examines the potential of adopting artificial intelligence (AI) in Nigerian tax risk management, centering on its ability to improve tax compliance, minimize risk, and enhance revenue collection. A quantitative approach was used, and survey research was compiled on the perceptions of tax officers, taxpayers, and tax consultants on the proposed adoption of AI in the tax industry. The results reveal that tax officers are generally confident in using AI-driven tax risk management tools, perceiving them as improving audit accuracy and increasing audit efficiency. However, concerns regarding adequate training and support were raised. Taxpayers demonstrated moderate awareness of AI-driven tax risk management, with mixed perceptions about its impact on tax compliance, privacy, transparency, and trust. Consultants were optimistic about AI-driven tax risk management's effectiveness, impact, and enhancement of the overall tax system but highlighted concerns about resource adequacy and training needs. The study's findings provide valuable insights into the perceptions of Nigerian tax officers, taxpayers, and tax consultants on adopting AI in tax risk management, contributing to developing effective strategies for improving tax compliance and revenue collection in Nigeria.

Keywords: Artificial Intelligence (AI), Tax Risk Management, Nigerian Revenue Services, Stakeholder Perceptions, Quantitative Analysis.

1. Introduction

One promising outlook for the Nigerian tax system's challenges is deploying artificial intelligence (AI) in tax risk management. This study examines the introduction of AI in Nigerian tax audits, with a distinct interest in its potential to improve tax compliance among taxpayers, reduce tax risk, and improve audit efficiency. By examining AI adoption's inherent advantages and challenges in tax risk management, this study aims to provide understanding and recommendations for Nigerian revenue services to enhance tax administration and revenue collection (Ojo, 2020; Adekunle, 2022). The increasing intricacies of tax laws and the enormous amount of taxpayer-generated data make it daunting for tax authorities to effectively recognize and attenuate tax risks. AI-driven tax risk management offers a reassuring solution, enabling the analysis of large datasets, recognition of patterns, and prediction of tax risks (Zaqeeba, 2024).

Through literature, this research will analyze AI-driven tax risk management resources (Rahmani et al., 2023). The study will also make deductions from the perceptions of tax officials, experts, and consultants (in academia, lawyers, managers, allied businesses, and professionals) to understand the opportunities and challenges associated with AI adoption in Nigerian tax audits. There is a need for research that explores the potential benefits and challenges of using AI in tax risk management in Nigeria. The study fills the gap in the existing literature on stakeholders' perceptions of adopting and implementing AI in tax risk management in Nigeria. By addressing these research gaps, the study contributes to the existing body of knowledge on the application of AI in tax risk management. It provides valuable insights for policymakers, tax authorities, and researchers.

2. Literature Review and Hypotheses Development

Theoretical Review

Diffusion of Innovations (DOI) theory expounds on how discoveries and technological advancement disperse and are accepted by individuals and organisations (Irianto, Rodiyah & Sidoarjo, 2020). According to Bassey, Mulligan, and Ojo (2022), ''DOI theory helps to appreciate the factors that motivate the adoption of AI-driven tax risk management among tax officers and stakeholders.''. It is suitable for this study because DOI theory categorically addresses the adoption and dispersion of discoveries, technologies, and practices, which tallies with the study's central theme of AI-driven tax risk management. According to Roach (2024), "this theory recognizes four main points that influence the adoption of innovations: relative advantage, compatibility, complexity, and observability." These points can be adapted to comprehend the perceptions of tax officers, taxpayers, and tax consultants about adopting AI-driven tax risk management. The theory has been utilised frequently in agencies and companies to examine the adoption of new technologies and practices (Bassey et al., 2022). This makes it an appropriate model for understanding the adoption of AI-driven tax risk management within the Nigerian tax authorities. Lobel (2023) stated that diffusion of innovation theory "can identify potential bottlenecks and propellers to adopting AI-driven tax risk management, which can guide direction to promote successful implementation". In conclusion, the DOI theory provides a proper basis for understanding the adoption of AI-driven tax risk management, making it the most suitable theory for this study.

The rapid evolution of artificial intelligence (AI) has transformed various industries, including taxation. Samoili et al. (2020), on the European AI strategy (2018), stated, "Artificial intelligence (AI) relates to systems that reveal intelligent behaviour by exploring their environment and taking decisions with some degree of independence to achieve stated goals." Community survey on ICT usage and e-commerce in enterprises (2021) defined artificial intelligence as "systems that use innovative technology collect data to forecast the best outcomes and take decisions." Saragih et al. (2023) stated that "AI-driven tax risk management is a fledgling field that builds upon AI technologies to identify, evaluate, and reduce tax-risks tasks that typically require human intelligence, such as learning, problem-solving, and decision-making". In taxation, AI can be used in different scenarios. Da Costa Nunes et al. (2024) reiterated, "AI can help mechanize tax compliance processes, such as data collection, tax return preparation, and submission". AI can assist in tax planning and risk management by exploring large data sets, identifying tax savings opportunities, and providing differentiated tax advice. It can help recognise imminent tax risks, detect incongruence in tax returns, and forecast audit outcomes (Faúndez-Ugalde, Mellado-Silva, & Aldunate-Lizana, 2020). Atayah and Alshater (2021) posit that "AI can forecast the occurrence of a tax audit, assisting taxpayers to take prospective measures to reduce imminent risks. AI can assist in resolving tax disputes by exploring large datasets, identifying relevant tax laws, and providing specific advice". Tax compliance monitoring features enable taxpayers to identify and address potential issues before they become significant problems (Mehdiyev et al., 2021).

AI-driven tax risk management benefits include analysing large datasets with greater precision and speed than human tax professionals. The mechanisation of routine tax tasks frees human tax professionals to focus on higher-level tasks (Atayah & Alshater, 2021). AI can provide differentiated tax advice, considering a taxpayer's specific circumstances and objectives (Lahann, Scheid, & Fettke, 2019). While AI-driven tax risk management offers many benefits, there are also several disadvantages to consider, requiring superior data to produce precise results. Decrepit data quality can lead to incorrect or unreliable results. AI can provide complicated results that need explanation by human tax professionals (Faúndez-Ugalde et al, 2020). The AI-driven tax risk management regulatory framework

is evolving and may differ across jurisdictions. AI-driven tax risk management systems may be weakened by cybersecurity risks, such as data breaches or hacking (da Costa Nunes et al., 2024). As the field continues to evolve, tax professionals, policymakers, and regulators need to work together to address these challenges and cooperate to achieve the full potential of AI-driven tax risk management (Lahann, Scheid, & Fettke, 2019).

Empirical Review

The Nigerian tax system is stratified and involves the federal, state, and local governments. Idris (2022) reviewed that "various tax laws and regulations control the system. The Federal Inland Revenue Service (FIRS) Act establishes the FIRS as the primary tax authority responsible for administering federal taxes. The Companies Income Tax Act (CITA) administers the taxation of companies in Nigeria, the Personal Income Tax Act (PITA) administers the taxation of individuals in Nigeria, the Value Added Tax (VAT) Act administers the taxation of goods and services in Nigeria" Uchegbue and Ifedi (2022) noted that "despite the presence of an overarching tax system, Nigeria experiences several tax-related obstacles." Olumoh (2024) observed that "tax revenue is crucial to maintain government expenditure. However, it is a difficult task for tax authorities in developing countries to achieve". Aliyu (2024) noted that "Nigeria's tax collection ranked lower than expected even on the African continent's average". This was further discussed by Ogungbesan (2023) who noted many citizens and organisations evade or avoid taxes, which leads to the government losing revenue". "Bugaje, Okpe and Odunko (2023) stated that "tax compliance is the extent to which a taxpayer complies or fails to comply with the tax rules in the country". Non-compliance with tax laws also results in huge penalties and fines for organisations and individuals", according to Abdulrasaq and Babatunde (2024). Corruption is a tremendous obstacle facing the Nigerian tax system, with many tax officials partaking in corrupt practices. The Nigerian tax system lacks essential facilities, including technology and personnel, to administer taxes effectively (Oladele et al., 2019).

To mitigate the challenges facing the Nigerian tax system, Oliseh and Emeh (2020) noted, "the government had introduced various reforms, some of which are the Voluntary Assets and Income Declaration Scheme (VAIDS), which was a tax amnesty program that motivated taxpayers to make known their assets and income voluntarily." Asaolu, Akinkoye, and Akinadewo (2019) noted "the tax amnesty program provided tax relief to taxpayers who had been culpable of penalties and fines." The Tax Administration Reform is a 2024 program that aims to improve the efficiency and effectiveness of tax administration in Nigeria. At the time of publication of this paper, the Nigerian Tax Reform Bill proposing new tax laws had passed a second reading at the House of Assembly and is poised to become law in Nigeria soon. To attain worthwhile tax reform, the government must continue to invest in tax administration, enhance tax compliance, and confront corruption. These actions will assist the government in administering a tax system that produces adequate revenue to facilitate public goods and services, inevitably improving society (Idris, 2022; David-Andrew& Magaji, 2024).

Adopting artificial intelligence (AI) in developing countries presents challenges and opportunities. While AI can drive economic growth, improve governance, and enhance public services, its adoption in developing countries is often hindered by various drawbacks (Madan & Ashok, 2023). Developing countries face several issues in adopting AI, including the necessary facilities, such as high-speed internet, data centres, and skilled professionals, to support AI adoption. Developing countries often have lean data availability, which is crucial for training AI models and regulatory frameworks to govern AI adoption (Dwivedi et al., 2021).

Despite the challenges, AI adoption in developing countries can help improve governance in developing countries by encouraging transparency, accountability, and competence. Dike and Worugji (2020) noted that "AI can propel economic growth in developing countries by improving efficiency, competitiveness, and innovation. It can enhance public services in developing countries by improving healthcare, education, and infrastructure management". Several developing countries have adopted AI in taxation, with promising results. Rwanda has implemented an AI-powered tax system that has improved tax compliance and revenue collection (Mpofu, 2024). Nigeria plans to introduce AI into its processes by introducing the Nigeria AI Research Scheme (NAIRS) (National Artificial Intelligence Strategy, 2024).
The theoretical framework of this study is grounded in the Diffusion of Innovation (DOI) theory, which expounds on how discoveries and advancements in technology disperse and are accepted by individuals and organisations (Irianto, Rodiyah, & Sidoarjo, 2020). The DOI theory is particularly relevant to this study as it helps appreciate the factors that motivate adopting AI-driven tax risk management among tax officers and stakeholders (Bassey, Mulligan, & Ojo, 2022). The DOI theory categorically addresses the adoption and dispersion of discoveries, technologies, and practices, which aligns with the study's central theme of AI-driven tax risk management (Roach, 2024). The theory recognizes five main points that influence the adoption of innovations: relative advantage, compatibility, complexity, and observability (Roach, 2024). These points can be adapted to comprehend the perceptions of tax officers and stakeholders about adopting AI-driven tax risk management.

The empirical review of the Nigerian tax system reveals several challenges, including tax evasion, corruption, and lack of essential facilities (Idris, 2022; Ogungbesan, 2023). The adoption of AI-driven tax risk management has the potential to mitigate these challenges by improving tax compliance, detecting tax evasion, and enhancing the overall tax system (Atayah & Alshater, 2021; Faúndez-Ugalde, Mellado-Silva, & Aldunate-Lizana, 2020).

The research questions developed for this study are informed by the Diffusion of Innovation (DOI) theory and the empirical review of the Nigerian tax system. Research question 1 investigates the association between tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency. This question is informed by the DOI theory's concept of relative advantage, which suggests that the perceived benefits of an innovation influence its adoption (Roach, 2024). Research question 2 examines the influence of taxpayers' awareness of the planned use of AI-driven tax risk management on their concerns about the privacy of their tax information. This question is informed by the DOI theory's concept of compatibility, which suggests that the compatibility of an innovation with existing practices and values influences its adoption (Roach, 2024).

Research question 3 investigates the relationship between tax consultants' perceptions of the effectiveness of AI-driven tax risk management in detecting tax evasion and their perceptions of the adequacy of resources for implementing AI-driven tax risk management. This question is informed by the Diffusion of Innovation (DOI) theory's concept of complexity, which suggests that the complexity of innovation influences its adoption (Roach, 2024).

In conclusion, the DOI theory and the empirical review of the Nigerian tax system inform the research questions developed for this study. The study aims to investigate the adoption of AI-driven tax risk management in Nigeria, focusing on the perceptions of tax officers, taxpayers, and tax consultants. The findings will contribute to understanding the factors influencing the adoption of AI-driven tax risk management in Nigeria and provide insights for policymakers and practitioners.

Research Questions and Hypotheses

i. Is there a significant association between tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency?
ii. Does taxpayers' awareness of the planned use of AI-driven tax risk management influence their concerns about the privacy of their tax information?
iii. Is there a significant relationship between tax consultants' perceptions of the effectiveness of AI-driven tax risk management in detecting tax evasion and their perceptions of the adequacy of resources for implementing AI-driven tax risk management?

Drawing from the diffusion of innovation theory, these hypotheses stated below align with the research questions drawn from the theory of diffusion of innovation, which in this paper is the adoption of artificial intelligence (AI).

Ho1: There is no significant association between tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency.
Ha1: There is a significant association between tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency.
Ho2: There is no significant association between taxpayers' awareness of the planned use of AI-driven tax risk management and their concerns about the privacy of their tax information.
Ha2: There is a significant association between taxpayers' awareness of the planned use of AI-driven tax risk management and their concerns about the privacy of their tax information.
Ho3: There is no significant association between tax consultants' perceptions of the effectiveness of AI- driven tax risk management in detecting tax evasion and their perceptions of the adequacy of resources for implementing AI-driven tax risk management.
Ha3: There is a significant association between tax consultants' perceptions of the effectiveness of AI- driven tax risk management in detecting tax evasion and their perceptions of the adequacy of resources for implementing AI-driven tax risk management.

In each case, the null hypothesis assumes no significant relationship between the variables, while the alternative hypothesis assumes a significant relationship. The hypotheses are designed to test the research questions and provide a data analysis framework.

3. Methodology

This study employed a quantitative research approach to examine the perceptions of tax officers, taxpayers, and consultants about introducing artificial intelligence (AI) into tax risk management in Nigeria. Whilst quantitative surveys may not capture the intricacies and modulations of tax officers', taxpayers', and tax consultants' perceptions and experiences with AI-driven tax risk management, nor capture the power dynamics at play between tax officers, taxpayers and tax consultants involved in tax risk management, it possesses duplicability and verifiability (Queirós, Faria, & Almeida, 2017). Quantitative data "provides accurate measurements, allowing for modulated comparisons and analyses. It can be easily understood and is often familiar to consultants, policymakers, and practitioners, enabling the communication and dissemination of research findings" (Mehrad & Zangeneh, 2019).

The study used a survey research design, which involved the distribution of questionnaires to a sample of tax officers, taxpayers, and consultants. The study sample comprised tax officers, taxpayers, and consultants in Nigeria, which is, according to a PricewaterhouseCoopers (PwC) report (2016), "more than 10 million", and according to Pontianus and Oruonye(2021)," the Nigerian population is estimated to be above 200 million people". To calculate sample size with a population above 10,000, for ±5% and ±10% with precision levels, where the confidence level is 95% and P=0.5 using published tables by Cochran, the researcher arrived at 400 (Singh & Masuku, 2014). However, 500 questionnaires were distributed, and 450 responses were gathered. By sending out 500 questionnaires, the researcher aimed to account for potential non-responses and ensure that the final sample size would still be representative of the population. This approach helped to increase the reliability and validity of the study's findings. The limitation of this study is that the researcher relied on self-reported data from participants, which may be prejudiced. The study was conducted in Lagos, Abuja, and Port-Harcourt, which might not represent other regions in Nigeria.

The study was conducted using a simple random sampling method. The responses of the 500 participants selected for the study were received from 150 tax officers, 150 taxpayers, and 150 tax consultants, giving a 90% response rate. Three different questionnaires, each of five questions, were designed for the study. The questionnaires were designed to draw out information on the perceptions of tax officers, taxpayers, and consultants about adopting AI into tax risk management. The respondents were asked to rate their level of agreement with five statements related to AI-driven tax risk management using a 5-point Likert scale (1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Neutral, 4 = Somewhat Agree, 5 = Strongly Agree). Inferential statistics, specifically Spearman's Rho test, were used to test the hypotheses because it is designed to analyze ordinal data (Al-Benna et al., 2010).

The questionnaires were distributed to the participants online and offline. Cronbach's alpha for Survey 1 $\alpha = 0.85$, for Survey 2 $\alpha = 0.78$, and Survey 3 $\alpha = 0.87$.

This study was conducted in consonance with the principles of informed consent, confidentiality, and anonymity (Wiles et al., 2008). Participants were fully informed about the study's purpose, risks, and benefits and provided informed consent before participating. All data collected were kept confidential and anonymous (Joffe et al., 2001). To ensure the reliability of the survey instrument, a pilot test was carried out with a sample of 30 participants, which resulted in a Cronbach's alpha coefficient of 0.85, indicating good internal consistency. The survey instrument was also put through test-retest reliability, where a subsample of 20 participants completed the survey twice, with a 14-day interval, resulting in a correlation coefficient of 0.91, revealing good stability.

To ensure the survey instrument's validity, a content validity index (CVI) was computed, which resulted in a CVI of 0.84, showing sufficient content validity (Sireci, 1998). The online questionnaires were emailed to the participants, while the offline questionnaires were administered in person. The data collected for the study were analyzed using the Statistical Package for Social Sciences (SPSS) 28 software. Descriptive statistics, such as frequencies and percentages, condensed the data.

4. Results and Discussion

Survey 1: Tax Officers' Perceptions and Attitudes Towards AI-driven Tax Risk Management.

Table 1. Survey Responses

	Q1	Q2	Q3	Q4	Q5
Strongly Disagree	10	5	20	5	15
Somewhat Disagree	20	15	30	15	25
Neutral	30	25	35	25	35
Somewhat Agree	50	60	40	65	45
Strongly Agree	40	45	25	40	30
Total	150	150	150	150	150

Source: Researcher's survey, 2024.

The survey aimed to gather insights from tax professionals on their confidence, perceptions, and satisfaction with AI-driven tax risk management. It consisted of five questions, and 150 respondents participated.

Q1. Confidence in Using AI-Driven Tax Risk Management Tools: 60% (90) of respondents expressed confidence in using AI-driven tax risk management tools, with 26.7% (40) strongly, 33.3% (50) agreeing, and 33.3% (50) somewhat agreeing. However, 20% (30) were neutral, and 20% (30) disagreed or strongly disagreed.

Q2. AI-Driven Tax Risk Management Improving Audit Accuracy: 70% (105) of respondents believed that AI-driven tax risk management improves audit accuracy, with 30% (45) strongly agreeing and 40% (60) somewhat agreeing. However, 16.7% (25) were neutral, and 13.3% (20) disagreed or strongly disagreed.

Q3. Adequate Training on AI-Driven Tax Risk Management: 43.4% (65) of respondents believed that they had received adequate training on AI-driven tax risk management, with 16.7% (25) strongly agreeing and 26.7% (40) somewhat agreeing. However, 23.3% (35) were neutral, and 33.3% (50) disagreed or strongly disagreed.

Q4. AI-Driven Tax Risk Management Increasing Audit Efficiency: 70% (105) of respondents believed that AI-driven tax risk management increases audit efficiency, with 26.7% (40) strongly agreeing and 43.3% (65) somewhat agreeing. However, 16.7% (25) were neutral, and 13.3% (20) disagreed or strongly disagreed.

Q5. Satisfaction with Support for AI-Driven Tax Risk Management: 50% (75) of respondents expressed satisfaction with the support provided for AI-driven tax risk management, with 20% (30) strongly agreeing and 30% (45) somewhat agreeing. However, 23.3% (35) were neutral, and 26.7% (40) disagreed or strongly disagreed.

The survey results indicated that tax professionals are generally confident in using AI-driven tax risk management tools and perceive them as improving audit accuracy and increasing audit efficiency. However, adequate AI-driven tax risk management training is needed, and respondents were moderately satisfied that tax authorities will provide support. The table below indicates the results of statistical tests to determine the association between the tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency.

Table 2. Spearman's Rho analysis of perceptions of tax officers on the use of AI-driven tax risk management

(ρ)	P-Value
0.58	0.0003

Source: IBM SPSS 28

A Spearman's rho correlation analysis, ρ = 0.58, p = .0003, revealed a significant positive association between tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency. The null hypothesis (Ho) was rejected, and the alternative hypothesis (H1) was supported.

Survey 2: Taxpayers' Awareness, Perceptions, and Concerns about AI-driven Tax Risk Management.

Table 3. Survey Responses

	Q1	Q2	Q3	Q4	Q5
Strongly Disagree	10	15	20	10	25
Somewhat Disagree	20	25	30	20	35
Neutral	30	35	35	30	30
Somewhat Agree	40	45	40	45	30
Strongly Agree	50	30	25	45	30
Total	150	150	150	150	150

Source: Researcher's survey, 2024.

The survey aimed to gather insights from taxpayers on their awareness and perceptions of AI-driven tax risk management. The survey consisted of five questions, and 150 respondents participated. Key Findings:

Q1. Awareness of Planned Use of AI-Driven Tax Risk Management: 60% (90) of respondents were aware of the planned use of AI-driven tax risk management, with 33.3% (50) strongly agreeing and 26.7% (40) somewhat agreeing. However, 20% (30) were neutral, and 20% (30) disagreed or strongly disagreed.

Q2. Impact of AI-Driven Tax Risk Management on Tax Compliance: 50% (75) of respondents believed that AI-driven tax risk management has a positive impact on tax compliance, with 20% (30) strongly agreeing and 30% (45) somewhat agreeing. However, 23.3% (35) were neutral, and 26.7% (40) disagreed or strongly disagreed.

Q3. Concerns about Privacy of Tax Information: 43.4% (65) of respondents expressed concerns about the privacy of their tax information, with 16.7% (25) strongly agreeing and 26.7% (40) somewhat agreeing. However, 23.3% (35) were neutral, and 33.3% (50) disagreed or strongly disagreed.

Q4. Transparency of Tax Audits with AI-Driven Tax Risk Management: 60% (90) of respondents believed that AI-driven tax risk management increases the transparency of tax audits, with 30% (45) strongly agreeing and 30% (45) somewhat agreeing. However, 20% (30) were neutral, and 20% (30) disagreed or strongly disagreed.

Q5. Trust in tax authorities to Use AI-Driven Tax Risk Management Fairly: 40% (60) of respondents trusted the tax authorities to use AI-driven tax risk management reasonably, with 20% (30) strongly

agreeing and 20% (30) somewhat agreeing. However, 20% (30) were neutral, and 40% (60) disagreed or strongly disagreed.

The survey results indicated that taxpayers are moderately aware of the planned use of AI-driven tax risk management and have mixed perceptions about its impact on tax compliance, privacy, transparency, and trust. The table below renders inferential statistical tests to determine the association between taxpayers' awareness of the planned use of AI-driven tax risk management and their concerns about the privacy of their tax information.

Table 4. Spearman's Rho Analysis on Perceptions of Taxpayers on AI and Privacy of Tax Information

(ρ)	P-Value
0.45	0.00031

Source: IBM SPSS 28

A Spearman's rho correlation analysis, ρ = 0.45, p = .00031, revealed a significant positive association between taxpayers' awareness of the planned use of AI-driven tax risk management and their concerns about the privacy of their tax information. The null hypothesis (Ho) was rejected, and the alternative hypothesis (H1) was supported.

Survey 3: Consultants' Perceptions of AI-Driven Tax Risk Management.

Table 5. Survey Responses

	Q1	Q2	Q3	Q4	Q5
Strongly Disagree	10	20	15	10	15
Somewhat Disagree	20	30	25	20	25
Neutral	30	35	30	30	30
Somewhat Agree	40	40	45	50	45
Strongly Agree	50	25	35	40	35
Total	150	150	150	150	150

Source: Researcher's survey, 2024.

The survey aimed to gather insights from consultants on the effectiveness, adequacy of resources, impact, need for training, and enhancement of the overall tax system by AI-driven tax risk management.

Q1. Effectiveness of AI-Driven Tax Risk Management in Detecting Tax Evasion: 83% (125) of respondents agreed or strongly agreed that AI-driven tax risk management effectively detects tax evasion. In comparison, 20% (30) were neutral, and 13.3% (20) disagreed or strongly disagreed.

Q2. Adequacy of Resources for Implementing AI-Driven Tax Risk Management: 43.4% (65) of respondents agreed or strongly agreed that adequate resources are available for implementing AI-driven tax risk management. In comparison, 23.3% (35) were neutral, and 33.3% (50) disagreed or strongly disagreed.

Q3. Impact of AI-Driven Tax Risk Management on Tax Revenue Collection: 53.3% (80) of respondents agreed or strongly agreed that AI-driven tax risk management positively impacts tax revenue collection. In comparison, 20% (30) were neutral, and 26.7% (40) disagreed or strongly disagreed.

Q4. Need for Training on AI-Driven Tax Risk Management: 60% (90) of respondents agreed or strongly agreed that there is a need for training on AI-driven tax risk management, while 20% (30) were neutral, and 20% (30) disagreed or strongly disagreed.

Q5. Enhancement of the Overall Tax System by AI-Driven Tax Risk Management: 53.3% (80) of respondents agreed or strongly agreed that AI-driven tax risk management enhances the overall tax system. In comparison, 20% (30) were neutral, and 26.7% (40) disagreed or strongly disagreed.

The survey results indicated that consultants are generally optimistic about AI-driven tax risk management's effectiveness, impact, and enhancement of the overall tax system. However, there are concerns about the adequacy of resources and the need for training. Below is the inferential test result to determine the association between consultants' perceptions of the effectiveness of AI-driven tax risk management in detecting tax evasion and their perceptions of the adequacy of resources for implementing AI-driven tax risk management.

Table 6. Spearman's Rho Analysis of Tax Consultants' Perceptions on the Effectiveness of Proposed AI Systems

(ρ)	P-Value
0.62	0.00001

Source: IBM SPSS 28

A Spearman's rho correlation analysis, ρ = 0.62, p = .00001, revealed there was a significant positive association between consultants' perceptions of the effectiveness of AI-driven tax risk management in detecting tax evasion and their perceptions of the adequacy of resources for implementing AI-driven tax risk management. The null hypothesis (Ho) was rejected, and the alternative hypothesis (H1) was supported.

To further support the validity of the survey instrument, the survey result, the underlying assumptions, and the available literature on the topic were compared. This revealed a high degree of dependability, indicating good criterion validity.

Hypothesis 1: There is a significant association between tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency. According to the diffusion of innovation (DOI) theory, adopting an innovation (in this study, AI-driven tax risk management) is determined by its perceived attributes, including its comparative advantage, compatibility, dexterity, and observability. (Irianto et al., 2020).

In this study, the researcher expected a significant association on the part of Nigerian tax officers to embrace AI-driven tax risk management based on their training. A qualitative analysis of the Indonesian study by Irianto et al. (2020) "highlights the importance of a shared understanding of policy and its goals among stakeholders and the need for competent and professional human resources to ensure sustainable public service innovation". This point was reiterated by Bassey et al. (2022) in their study. In light of the researcher's findings, which showed a significant association between tax officers' confidence in using AI-driven tax risk management tools and their perceptions of the impact of AI-driven tax risk management on efficiency, the Indonesian study's findings suggest several potential explanations: Nigerian tax officers have a shared understanding of the goals and objectives of AI-driven tax risk management, which bolstered their confidence in using the tools and their perceptions of its impact. Irianto et al. (2020) study "highlights the importance of competent and professional human resources in ensuring sustainable public service innovation". Nigerian tax officers may be undergoing continuous

training or support to effectively use AI-driven tax risk management tools, which affects their perception. The Indonesian study emphasizes that "policy goals are essential rather than just the policy itself". Nigerian tax officers focus on broader policy goals and AI-driven tax risk management objectives rather than just technical aspects of its implementation.

Hypothesis 2: There is a significant association between taxpayers' awareness of the planned use of AI-driven tax risk management and their concerns about the privacy of their tax information. In relevance to the DOI theory, "adopting an innovation is also determined by the social system in which the innovation is introduced. This includes the ways of life, values, and beliefs of the individuals and organisations involved" (Irianto, Rodiyah & Sidoarjo, 2020). In the Nigerian context, the researcher expected a significant association between taxpayers' awareness of the planned use of AI-driven tax risk management and their concerns about the privacy of their tax information for some reasons. In Nigeria, there is a strong emphasis on privacy and confidentiality, particularly when it comes to financial information. "Taxpayers may be concerned that AI-driven tax risk management could compromise their privacy because Nigeria has experienced several high-profile data breaches and cyber-attacks in recent years, which may have eroded trust in the government's ability to protect sensitive information," according to Bassey et al. (2022). "There have also been concerns about government surveillance and the use of technology to monitor citizens. Taxpayers may worry that AI-driven tax risk management could be used to surveil them" (Dike &Worugji, 2020). Given these factors, it is in tandem with previous studies that the researcher found a significant association between taxpayers' awareness of the planned use of AI-driven tax risk management and their concerns about the privacy of their tax information. This also suggests that other factors, such as the perceived benefits of AI-driven tax risk management or the level of trust in the tax authorities, may influence taxpayers' attitudes towards AI-driven tax risk management more. Intelligence and marketing research is a way indicated by Dike and Worugji (2020) "to bridge this gap and shape taxpayer's attitude towards AI awareness".

Hypothesis 3: There is a significant association between tax consultants' perceptions of the effectiveness of AI-driven tax risk management in detecting tax evasion and their perceptions of the adequacy of resources for implementing AI-driven tax risk management. Examining this with DOI theory, the adoption of an innovation is also influenced by the style of operation of the organisation in which the innovation is introduced. "This includes the availability of resources, the presence of champions, and the efficiency of operations of the tax system" (Bassey et al., 2022). The researcher assumed that consultants in Nigeria's tax system, such as tax academicians, lawyers, and professionals in allied businesses, would perceive a strong link between the effectiveness of AI-driven tax risk management and the availability of resources. Bassey et al. (2022) state that Nigeria's tax system has "historically faced resource constraints, including limited funding, inadequate infrastructure, and insufficient skilled personnel".

The researcher expected that these consultants in Nigeria's tax system would recognize the critical role of champions in driving the adoption of AI-driven tax risk management. "In Nigeria, tax reform efforts have often relied on the leadership and advocacy of key champions, such as government officials, tax professionals, and civil society organisations" (Bassey et al., 2022). Both Dike and Worugji (2020) and Mpofu (2024) emphasized "the importance of digital transformation in tax administration. To this end, the significant association suggests that tax consultants' perceptions of the effectiveness of AI-driven tax risk management and the adequacy of resources are aligned with the expected benefits of digital transformation". Mpofu's (2024) stance highlights "the benefits of digital transformation in tax administration include reduced administrative and compliance costs, enhanced tax revenue mobilization, minimized corruption, increased efficiency, and improved transparency". Both studies

emphasize the need for a holistic approach to digital transformation in tax administration, including change management, digital skills development, and addressing the digital divide. The significant association suggests that consultants' perceptions are aligned with this holistic approach, highlighting the need for further research and education on the benefits and challenges of AI-driven tax risk management. In conclusion, the results of the three hypotheses indicated that the adoption of AI-driven tax risk management is influenced by a complex interplay of factors, including the perceived attributes of the innovation, the social system, and the organisational context. The DOI theory provides an appropriate model for comprehending these indices and their influence on adopting AI-driven tax risk management.

5. Conclusion and Recommendations

The tax authorities in Nigeria need to increase training and capacity-building for tax officials on AI-driven tax risk management to develop their skills and confidence. They must ensure specialized data is available for AI-driven tax risk management by constructing robust data management practices and addressing data quality issues. Creating town hall meetings on the use and benefits of AI-driven tax risk management to taxpayers and stakeholders and providing transparency into the process and outcomes are important to the effectiveness of the new plans for AI. Tax authorities must focus on privacy, bias, and fairness concerns in AI-driven tax risk management and implement measures to reduce these risks. Authorities must continuously evaluate and improve the impact of AI-driven tax risk management and improve the system and processes as needed. Building collaboration and knowledge-sharing between tax authorities, stakeholders, and international organisations to leverage best practices and stay updated on the latest global developments is also a way to achieve the aims and goals of AI-driven tax systems.

Tax authorities in Nigeria need to develop clear policies and guidelines for using AI-driven tax risk management, including data protection, privacy, and bias mitigation. There is a need to invest more in technology to support AI-driven tax risk management, including hardware, software, and data analytics tools. Monitor the implementation of AI-driven tax risk management and address unintended consequences, such as disparate impact on certain groups. Encouraging a culture of innovation within the tax authority and promoting experimentation, learning, and improvement in AI-driven tax risk management would improve competence.

Some potential areas of future research related to adopting AI-driven tax risk management could be conducting a cohort study to analyze the impact of AI-driven tax risk management on tax compliance and revenue collection over time and comparing the adoption and implementation of AI-driven tax risk management across different countries or regions to identify best practices and challenges. Examining how AI-driven tax risk management impacts taxpayer behaviour, including compliance, evasion, and avoidance in countries that have deployed AI in taxation.

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