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The role of artificial intelligence in enhancing tax compliance among SMMEs: a scoping review and implications for South Africa

By

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A dissertation submitted in partial fulfilment of the requirements for the Master of Accountancy in Taxation degree at the University of KwaZulu-Natal

Supervisor: Professor Mabutho Sibanda

2024

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Dedication

To my wonderful parents, Nombuyiselo Primrose Bongoza and Mzizi Christopher Bongoza. Though my late father is no longer with us, his memory continues to guide and inspire me every day.

To my dear late sister, Andiswa "Winnie" Bongoza, whose spirit and love remain a constant source of strength.

To my entire family: my brothers, sisters, nieces, and nephews- your unwavering love and support have been my rock. This work is dedicated to all of you, with immense gratitude and love.

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Abstract

South Africa's economic stability relies significantly on Small, Medium and Micro Enterprises (SMMEs) that represent around 60% of businesses and enhance employment opportunities and economic growth. SMMEs face numerous challenges, including tax compliance. The complexity and cost of tax compliance are significant hurdles, as these enterprises often lack the necessary personnel and expertise to navigate intricate tax regulations, leading to potential tax penalties. Artificial Intelligence (AI) offers an effective solution to these issues by automating processes, improving accuracy, and reducing expenses. AI-powered tax compliance tools can help SMMEs to manage complex tax laws, minimise errors, and improve efficiency. They can also assist with data analysis, risk assessment, and audit preparation, allowing businesses to allocate resources to more strategic activities. Understanding these benefits is crucial to encourage SMMEs' adoption of AI technology. The South African Revenue Service (SARS) has introduced several measures in order to streamline tax compliance, such as utilising technology and digital platforms. SARS' digital transformation aims to modernise and enhance tax administration, demonstrating the important role played by tax in fiscal development. Technology is evolving at a rapid pace, making it at ease for taxpayers to access information and embark on tax-related activities, which used to take longer and required much data. To guide the research process, the study adopted a scoping review methodology. This approach allowed for a structured exploration of existing literature and evidence, helping to map key concepts and identify gaps related to AI-driven tax compliance among SMMEs. This study aims investigates how AI can help small businesses in South Africa stay on top of their tax responsibilities. The research aims to find simple, practical ways to reduce the stress and complexity of staying compliant. The study's objectives included evaluating how AI can improve tax compliance, identifying the necessary infrastructure for AI-powered models, and determining the knowledge and skills required to implement these models. The findings have practical implications for tax practitioners, tax agencies and policymakers, informing the design of targeted interventions and educational initiatives to increase tax awareness and foster a culture of compliance among SMMEs. By overcoming the challenges and leveraging AI technologies, SMMEs can enhance their competitiveness and operational efficiency. This ultimately supports economic development and improves their compliance status, contributing to a more robust and fair tax system. Some of the challenges faced during the study included limited access to reliable data due to confidentiality concerns, the possibility of participation bias, and the fast-paced evolution of AI technology.

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List of Abbreviations

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
BBB-EE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
DOI	Diffusion of Innovation
PAYE	Pay As You Earn
RPA	Robotic Process Automation
SARS	South African Revenue Services
SME	Small and Medium-Sized Enterprise
SMME	Small Medium and Macro Enterprise
TAM	Technology Acceptance Mode
UIF	Unemployment Insurance Fund
VAT	Value Added Tax

Chapter 1: Introduction

1.1 Introduction

This study investigated the usage of artificial intelligence (AI) in assisting South African Small, Medium and Micro Enterprises (SMMEs) to adhere to tax regulations by simplifying processes, and reducing errors. Chapter 1 introduces the study by presenting its background, problem statement, and objectives and research questions. It details the importance of the research, the delimitations, assumptions, and limitations, and defines key terms. The chapter ends with a brief summary and the organisation of the study.

1.2 Understanding the Context of the Study

SMMEs are the cornerstone of the South African economy, accounting for approximately 60% of businesses and making a meaningful contribution to employment creation and economic growth (BizCommunity, 2022). These enterprises are vital for economic development, innovation, and social stability. However, SMMEs face various obstacles, including tax compliance, which can be particularly burdensome due to limited resources and expertise.

Despite considerable strides in regulatory frameworks, the expenses associated with tax compliance continue to pose significant challenges for SMMEs. These businesses often lack the requisite personnel, and expertise to navigate intricate tax regulations and fulfil all their tax obligations promptly and comprehensively (Scholtz & Laing, 2024). Complying with tax regulations is crucial for the smooth operation of any business as not doing so can lead to heavy fines and, in extreme cases, even force a business to shut down (Buthelezi, 2023). However, the sophisticated nature of tax laws and the administrative workload they impose can pull valuable resources away from a business's core activities, ultimately stifling growth and sustainability.

Artificial Intelligence (AI) holds the promise of revolutionising tax compliance among SMMEs by automating tasks, enhancing accuracy, and reducing costs. AI-powered tax compliance tools can help SMMEs to navigate complex tax laws and regulations, reduce errors, and improve overall efficiency (KPMG, 2023). AI can also assist with data analysis, risk assessment, and audit preparation, freeing up resources for more strategic activities (PricewaterhouseCoopers, n.d.). It is essential that SMMEs understand these factors in order to encourage them to adopt and use AI technology.

The South African Revenue Service (SARS) has introduced various inventiveness to simplify tax compliance, including the use of technology and digital platforms. SARS is currently undergoing a digital transformation to modernise and enhance its tax administration capabilities (Legal, 2023). This includes the implementation of e-filing systems, mobile applications, and AI-driven analytics to detect non-compliance and fraud. These initiatives aim to make tax compliance more accessible and less burdensome for taxpayers, particularly SMMEs.

The global trend towards digitalisation as well as the Fourth Industrial Revolution (4IR) have accelerated AI adoption in various sectors, including taxation. Countries like the United States of America, United Kingdom and Australia have already implemented AI-driven tax compliance systems with notable success. These systems have improved tax collection efficiency, reduced administrative costs, and enhanced taxpayer satisfaction. South Africa can learn from these international experiences to tailor AI solutions that address local challenges and opportunities.

The rapid development of technology and information simplifies and make it faster for taxpayers to obtain information and embark on other tax activities. This has made the taxation process, which used to be lengthy and complicated, easier and faster (Sinambela & Mardikaningsih, 2020, cited in Lestari & Sinambela, 2022). Taxpayers should also explore ways to reduce their tax burden with AI to enhance tax compliance. Entrepreneurs affirm that making the tax compliance process digital makes it easier to follow the rules and helps cut costs (Gangodawilage, Madurapperuma & Aluthge, 2021).

Although AI holds great potential for tax compliance, it comes with its own encounters. Issues such as keeping data private, protection from cyber threats, and the digital gap requires attention and be tackled to ensure everyone has access and that the AI system is trustworthy. Furthermore, training is very important to build capacity so that SMMEs have the skills they need to make the most of AI technologies.

Using AI in tax compliance can significantly lighten the administrative load for SMMEs. By automating routine tasks like data entry, calculating tax liabilities, and submission of tax returns, AI can assist SMMEs to save time and reduce the human error risk, leading to more precise tax filings as well as a lower likelihood of penalties due to non-compliance.

AI can also help the tax authorities to detect and stop tax fraud more effectively. Using advanced means of analysing data as well as machine learning, AI systems could greatly assist in detecting unusual patterns and behaviours that might suggest fraudulent activities. This proactive approach can help the tax authorities to take timely action to address potential issues, thereby improving overall tax compliance.

Furthermore, AI can provide personalised assistance to taxpayers, guiding them through the tax compliance process. AI-powered chat bots and virtual assistants can answer taxpayers' queries, provide information on tax regulations, and offer step-by-step guidance on completing tax forms. This can make the tax compliance process more user-friendly and less intimidating for SMMEs.

The potential benefits of AI in tax compliance go beyond efficiency and accuracy. By reducing the administrative burden and simplifying the tax compliance process, AI could assist SMMEs to focus on their core business. This would lead to increased productivity, innovation, and growth, ultimately contributing to South Africa's overall economic development.

However, in order to successfully integrate AI into tax compliance, the challenges that come with adopting this technology need to be addressed. Ensuring data privacy as well as security is paramount, as taxpayers need to trust that their sensitive financial information is protected. Moreover, the digital gap needs to be closed to ensure that all SMMEs, regardless of their size or location, can access AI-driven tax compliance tools.

Successful adoption of AI in tax compliance calls for capacity building and training. SMMEs need the right knowledge and skills to use AI technologies effectively. This means learning how to operate AI-powered tools, understanding both the benefits and limitations of AI, and being aware of the ethical considerations involved. The regulatory bodies and government have a vital role to play in this process. Policymakers should create a supportive environment that fosters innovation while ensuring that AI applications in taxation are transparent, fair, and accountable. This involves formulating guidelines for the ethical use of AI, safeguarding taxpayer data, and boosting digital literacy among SMMEs.

Working together, the private and public sectors can greatly enhance the adoption of AI in tax compliance. The tax authorities, technology providers, and business associations need to join forces to create AI solutions that meet the specific needs of SMMEs. Such partnerships also promote knowledge sharing and the spread of best practices. AI's potential to revolutionise tax

compliance is not restricted to SMMEs. Large corporations and individual taxpayers can also reap the benefits. For big companies, AI can help manage complex tax structures, optimise tax planning, and ensure compliance with international tax laws. For individuals, AI can make filing tax returns easier and offer personalised tax advice.

The adoption of AI in tax compliance is part of a broader trend towards digital transformation in the public sector. Governments around the world are increasingly leveraging digital technologies to improve public services, enhance transparency, and engage with citizens. In the context of taxation, digital transformation can lead to more efficient tax administration, better taxpayer services, and increased compliance. The success of AI in enhancing tax compliance will depend on taxpayers' willingness to embrace new technologies. To build trust in AI systems, it's crucial to be open about how AI algorithms are developed and used. People need to understand the process and feel confident that everything is done transparently. The tax authorities need to communicate the benefits of AI to taxpayers and address any concerns they may have about data privacy and security.

Beyond just improving tax compliance, AI can also help to achieve broader economic and social goals. By easing the administrative load on SMMEs, it can support business growth and job creation, positively influencing economic development and social stability. Tax compliance through AI can also boost government revenue, enabling additional investment in enhancing public services and infrastructure, and benefiting society as a whole.

However, it is important to proceed carefully when integrating AI into tax compliance. Policymakers and the tax authorities must weigh the ethical considerations, making sure that AI systems are well designed to be fair, transparent, and accountable. This will ensure that the technology is used responsibly and benefits everyone.

In summary, AI holds great promise for making tax compliance more efficient, accurate, and user-friendly for SMMEs in South Africa. By tackling the challenges and harnessing the advantages of AI, policymakers and the tax authorities can support SMMEs in adhering to tax regulations. This, in turn, can foster economic growth and stability, benefiting the broader economy. This study explored how AI can enhance tax compliance among SMMEs, offering valuable insights for developing effective strategies and policies.

1.3 Problem Statement

Taxpayers are naturally inclined to reduce their tax burden through tax fraud or evasion (Dlamini, 2022). There is a research gap in assessing how AI can assist in enhancing tax compliance in South Africa. Despite their significant contribution, SMMEs often face challenges navigating the complex tax environment. The 2023 Tax Statistics Report, a collaboration between National Treasury and SARS, notes that as at September 30, 2023, in the 2021 tax year, 1.06 million companies were assessed. It was found that 159,307 small business corporations (SBCs) paid tax at a preferential graduated income tax rate, instead of the fixed corporate tax rate of 27% (Scholtz & Laing, 2024). This suggests that South African SMMEs face significant challenges pertaining to tax compliance. The goal of using information technology in taxation is to make the process faster, simpler, and more accurate, leaving taxpayers with a positive and satisfying experience (Lestari & Sinambela, 2022). The benefits of introducing AI for taxpayers need to be assessed as well as how SMME owners feel about its introduction to enhance tax compliance.

1.4 Objectives of the study

The research aimed to achieve the following objectives:

- To evaluate how AI can improve tax compliance among SMMEs.
- To identify the infrastructure needed for AI-powered tax compliance models.
- To determine the necessary knowledge and skills for implementing AI-based tax compliance models.

1.5 Research Questions

The following research questions were addressed to achieve the research objectives:

- How can AI enhance tax compliance among SMMEs?
- What infrastructure is required to implement AI-powered tax compliance models effectively?
- What knowledge and skills are required for the successful implementation of AI-based tax compliance frameworks/models?

1.6 Importance of the Study

The literature on the use of AI by taxpayers notes that SMMEs confront challenges in being tax compliant. This study explored how AI can promote tax compliance in order to avoid fines and penalties. Entrepreneurs assess the ease with which they can fulfill their tax compliance obligations without incurring additional costs (Gangodawilage, Madurapperuma & Aluthge, 2021).

The outcomes of this scoping review will assist tax agencies in South Africa and other developing countries to design targeted interventions and educational initiatives to promote the use of AI solutions. Policymakers and the tax authorities can draw on these insights to develop policies and strategies that increase tax awareness among SMMEs, fostering a culture of informed and willing compliance. This, in turn, will support economic development and SMMEs' compliance status.

In addition, tax practitioners stand to benefit significantly from the integration of AI in tax compliance processes. By leveraging AI tools, practitioners can streamline client services, reduce manual workloads, and offer more accurate, real-time tax advice. This not only enhances their operational efficiency but also positions them as strategic partners in helping SMMEs navigate complex tax environments. As AI adoption grows, practitioners who embrace these technologies will be better equipped to meet evolving client expectations and regulatory demands.

1.7 Delimitations (Scope) of the review

The review's boundaries are set in terms of the timeframe, geography, theoretical framework, and methodology. This study hones in on SMMEs in South Africa, exploring how AI can improve tax compliance in this setting.

1.8 Assumptions

The study assumed that SMMEs are willing to adopt AI technologies for tax compliance and that the necessary infrastructure and skills can be developed or acquired. It also assumed that AI can significantly improve tax compliance processes.

1.9 Limitations of the Study

Potential limitations included access to accurate data due to confidentiality issues, participation bias, and the rapidly changing nature of AI technology. These limitations had the potential to affect the generalisability of the findings, but efforts were made to minimise their impact.

1.10 Definition of Terms

Artificial Intelligence (AI): When machines, especially computers, mimic human intelligence processes.

Tax Compliance: How well a taxpayer follows the tax laws and regulations.

SMMEs: Small, Medium, and Micro Enterprises.

SMME: Used interchangeably with SME.

1.11 Organisation of the Study

This section covered the research by detailing the background, problem statement, objectives, research questions, significance, scope, assumptions, limitations, and key terms. The rest of the chapters are organised as follows:

Chapter 2: Literature Review

This chapter provides a comprehensive review of the existing literature on AI and tax compliance. It also discusses the study's theoretical framework, tax compliance challenges among SMMEs, and explores the role of AI in overcoming these challenges. The chapter examines global trends in AI adoption for tax compliance, with a focus on lessons learned from other countries. It then explores the current state of AI adoption in South Africa, highlighting government initiatives and policies. Furthermore, it examines barriers to AI adoption, such as data protection, cybersecurity, and the technology gap.

Chapter 3: Research Methodology

Chapter 3 highlights the methodology utilised to conduct the research, covering the study design, and the methodology utilised to collect and analyse the data. It provides the rationale for the selection of these methods and shows how they supported the research objectives. The chapter also outlines the sampling strategy, including how participants were selected and the

sample size. Lastly, it discusses the ethical considerations taken into account and the measures adopted to promote validity and reliability.

Chapter 4: Scoping Review

The scoping review delves into the findings of the review, focusing on tax awareness, understanding and behaviour among individual taxpayers in South Africa. The goal is to address the research questions by examining the current state of tax compliance and investigating how AI might improve it. The chapter offers a thorough evaluation of the results, emphasising the main themes and patterns that emanated from the data. It contrasts these results with published studies to pinpoint gaps and propose areas for future research.

Chapter 5: Conclusions, Recommendations and Suggestions for Future Research

Chapter 5 highlights a synopsis of the research's key results and their implications for practical application. It offers recommendations to policymakers, the tax authorities, and SMMEs on how to use AI to boost tax compliance. The chapter also makes suggestions for future research. In bringing together the insights from the research, it aims to promote the development of effective strategies to improve tax compliance among South African SMMEs.

Chapter 2: Literature Review

2.1 Introduction

This chapter provides a summary of the major concepts and topics, setting the stage for a detailed exploration of the relevant theoretical and empirical literature. It examines the concepts of SMMEs, AI, and their intersection, explores how they have been defined in the literature, and discusses the background and motivation for the study, building on insights from the preceding chapter. This is then followed by a thorough evaluation of the study on the impact of South African SMMEs' use of AI in order to understand how it can enhance tax compliance among these businesses.

2.2 Theoretical Literature

This section introduces key theories related to the topic. All research should be guided by the broad theoretical literature. The traditional theories under which the study falls constitute its theoretical framework.

Diffusion of Innovation (DOI) Theory

The DOI covers all phases of the creative process and emphasises the advantages and disadvantages of innovation adoption (relative advantage, compatibility, and complexity). This theory is particularly well-suited for examining the adoption and diffusion of AI technology for tax compliance among SMMEs. Rogers (2003) explains how innovations and technologies circulate within cultures alongside the speed of the process. The theory divides adopters into five classes: innovators, early adopters, early majority, late majority, and laggards. Understanding these categories is crucial to effectively plan the adoption of AI in tax compliance as each has distinct characteristics and behaviours that can impact successful implementation. By acknowledging these differences, strategies can be customised to accommodate the needs and concerns of every group, leading to a smoother and more effective adoption process.

Technology Acceptance Model (TAM)

The TAM was established to explain individuals' acceptance and use of technologies. It explores how notions such as ease of use and convenience influence users' perspectives on the use of a device and intention to use it. According to Davis (1989) who first introduced it, the

TAM states that perceived effectiveness and simplicity are the two most critical determinants that determine if operators will accept the technology. This model is essential for understanding how SMMEs might adopt AI technology for tax compliance.

The study aimed to explore what influences small businesses to adopt e-filing tax systems, using the TAM as the theoretical framework. It also considered how credible these systems seemed and the impact of users' confidence in their computer skills on their intention to use the system. The e-filing tax system, which helps with submitting tax returns and making online payments, relies a lot on how useful and easy to use people find it (View of Tax Compliance Costs and the Use of E-filing by SMMEs, n.d.). According to Maji and Pal (2017), people tend to find new technology more useful when they see that it helps them to complete their tasks. This positive perception then shapes their attitudes towards the technology (View of Tax Compliance Costs and the Use of E-filing by SMMEs, n.d.).

Deterrence Theory

This study also draws on Deterrence Theory, which is grounded in the idea that individuals make decisions by weighing up potential risks and rewards particularly in uncertain situations, as outlined in the Von Neumann-Morgenstern utility framework. While this foundational idea was introduced by Allingham and Sandmo (1972), recent research confirms that deterrence through audits and penalties continues to play a critical role in shaping taxpayer behavior.

Reddy, Moodley, and Olugbara (2024) found that taxpayer is most likely to comply with tax obligations when they are influenced by those factors around them, guided by a strong sense of right and wrong, and feel proud of their country. In this study, Deterrence Theory helps to explain how AI tools such as automated audit systems, real-time reporting, and anomaly detection can influence taxpayer behaviour. These technologies increase the perceived risk of detection and reduce opportunities for non-compliance. As a result, SMMEs may be more inclined to comply voluntarily in order to avoid penalties.

2.3 Empirical Literature

The empirical literature includes recent studies on the topic, often testing how well the theories discussed in the theoretical literature hold up in real-world scenarios.

AI’s influence on tax compliance among SMMEs

Tax compliance is a major challenge for many small businesses, largely because of the costs involved. Taxpayers note that the time spent traveling to the tax office add to this burden (View of Tax Compliance Costs and the Use of E-filing by SMMEs, n.d.). Small business owners often spend a significant amount of time on tax calculations and getting their documents in order for submission.

Berkovitch (2024) found that with compliance becoming more complex and reporting demands increasing in the corporate tax domain, technology is rapidly advancing to efficiently process large volumes of data and simplify labour-intensive tasks, aligning with the goal of working smarter.

Nieuwenhuizen (2019) concluded that businesses consider regulations and compliance requirements to be time-consuming and costly. Many business owners lack the expertise required to keep pace with constantly changing regulations and handle all compliance matters personally. While acknowledging the importance of regulations, they advocate for simplification.

Nieuwenhuizen (2019) adds that SMMEs highlighted several challenges with regard to compliance, regulations, and bureaucratic hurdles. These included dealing with Value Added Tax (VAT), Pay As You Earn (PAYE), the Unemployment Insurance Fund (UIF), the skills development levy and its reporting, labour laws, Black Economic Empowerment (BEE) and Broad-Based Black Economic Empowerment (BBB-EE) issues, industrial relations, tax-related issues, inquiries and pleas, municipal regulations, and registering new companies.

Skills development poses a challenge for South African SMMEs; indeed, it is considered to be an additional tax. Employers must pay a 1% skills levy on payrolls directly to SARS. According to Nieuwenhuizen (2019), 80% of this levy initially supported 25 Sector Education and Training Authorities (SETAs) for employee skills development. Employers could reclaim up to 65% of their training costs from SETAs. However, the number of SETAs has since been reduced to 23, and employers can now only reclaim about 35% after completing training. Claiming has also become more complex, with extra compliance criteria, and some training expenses are no longer refundable.

Nieuwenhuizen (2019) notes that many SMMEs find the administrative paperwork associated with training and claiming reimbursement cumbersome and complicated. A World Bank Group report on tax compliance expenses in transitional and developing countries notes that these hit

smaller companies harder. SMMEs find it difficult to deal with the tax system's growing complexity. They struggle to keep up with changing tax laws, face high costs in following VAT rules, and have to handle extra paperwork from tax offices. Consequently, they often seek assistance from tax experts, who charge fees for their services (Maketenya & Moyo, 2022, cited by Sibiya, A., Van Der Westhuizen, J., & Sibiya, B., 2023).

The intricate South African tax system places an additional burden on taxpayers, especially SMMEs that incur significantly higher tax compliance costs than multinational organisations. This highlights the need for administrative and policy adjustments to alleviate this burden (Sibiya et al., 2023).

Dlamini (2022) looked through a study in South Africa to explore the dynamics that influence taxation compliance amongst SMMEs in the Durban, South Africa. A quantitative research methodology was employed, with a sample of SMMEs with fewer than 50 employees. The study found that the complexity of the tax system often results in higher compliance costs, which in turn places significant pressure on the limited resources of small businesses.

Benefits and Limitations of AI-Powered Tax Compliance Tools

Alahira, J., Mhlongo, N. Z., Falaiye, T., Olubusola, O., Daraojimba, A. I., & Oguejiofor, B. B. (n.d.) investigated how AI contributes to improving tax compliance, which is crucial for governance and economic stability. The study found that strategic use of AI can enhance the government’s revenue collection while simultaneously reducing the tax compliance burden for taxpayers. It suggested that policymakers should adopt a progressive approach, balancing innovation with the necessary regulations in order to tap into the transformative power of AI.

Adelekan, O. A., Adisa, O., Ilugbusi, B. S., Chimezie, O., Awonuga, K. F., Asuzu, O. F., & Ndubuisi, N. L. (2024) reviewed the inclusion of AI and block chain technology in the United States’ tax administration. A quantitative approach was employed to analyse the existing literature to understand how current and future technologies impact tax administration. The study concluded that AI and block chain are crucial to enhance tax compliance and efficiency. However, challenges like data privacy concerns need to be taken into account. The authors highlighted the importance of strong regulatory frameworks to support these technologies.

Potential Role of AI in SMME Business Operations

Berkovitch (2024) found that AI is emerging as a transformative force in enhancing efficiency within the tax and accounting sectors. According to the recent Future of Professionals report, AI has been identified as the top priority for improving operational effectiveness. This sentiment is particularly strong among corporate tax teams, with 75% of respondents highlighting AI as a critical area of focus. This widespread recognition of AI's potential underscores its importance in streamlining processes, reducing errors, and ultimately driving improved compliance and performance in tax-related activities.

To help small business taxpayers in rural areas, it was suggested that the South African Revenue Service (SARS) provide access to speed points or mobile units to assist taxpayers who own small business in rural areas. This would minimise time spend on travelling and lower taxation compliance expenses for these businesses. The main expenses they incur are the fees charged by accountants and tax practitioners, as well as litigation costs or lawyer's fees. By using technology, some of these costs can be avoided while still ensuring compliance.

AI has much to offer when it comes to improving the tax function (Hlomendlini, 2022). One of the biggest advantages is its ability to quickly handle large numbers of transactions. Though systematising routine activities, AI frees tax professionals to concentrate on the most important activities, which boosts both efficiency and productivity (Ernst & Young Global Ltd, 2020, cited by Hlomendlini, 2022).

Digitalisation plays an instrumental role for SMMEs globally, including European and American countries. Using digital technologies can boost economic growth and enable SMMEs to thrive and remain successful (Ashrafi & Murtaza, 2008, cited by Mutobvu, 2020). Balancing time savings with quality tax work is crucial, and AI excels at achieving this balance. Innovative tools like machine learning, generative AI, and advanced data analytics help tax professionals to provide precise, on time calculations, tax filings, and reports. These tools improve transparency and ensure compliance with tax regulations (Berkovitch, 2024).

AI can be utilised to execute rules-based processes, and automatically track and document tax activities and outcomes. This enables the creation of comprehensive audit trails and facilitates transparent communication with stakeholders such as shareholders, management, those charged with governance, regulators, and auditors (Berkovitch, 2024).

SMMEs' Perceptions Regarding AI Adoption for Tax Compliance Enhancement

Schoeman and Symour (2022) explored the barriers to AI adoption among South African SMEs. The study highlighted the South African tendency to rely on informal networks to inform decision-making regarding AI adoption. It applied an interpretive philosophy, as the adoption of AI is subjective and takes into account the human experience within the social context. A qualitative approach was employed and the study focused on seven medium-sized organisations, although a limitation was a lack of diversity. The model derived through inductive reasoning revealed that fear-based perceptions related to losing control of AI-enabled processes were the primary inhibiting factor.

Awareness and Understanding of AI among SMMEs in South Africa

Hayat et al. (2022) examined the factors that influence Malaysian taxpayers' compliance behaviour. A cross-sectional, quantitative approach was employed to examine how various factors influence both compliance intention and behaviour. The researchers recommended that future studies should consider inclusion of samples from nearby countries in order to explore cultural factors related to trust in government, and consider the factors that affect the effectiveness of governance and perceptions of corruption, which could impact tax compliance intention and behaviour.

Buthelezi's (2023) quantitative research focused on compliance with taxation challenges faced by SMMEs in the Durban Central Business District. Findings suggested that regular tax education could help alleviate SMMEs' tax burden. The study also highlighted the need for further research to evaluate the quality and relevance of taxation information given by SARS to SMMEs and explore its perceived effectiveness among these businesses.

Use of the Internet by South Africans Including SMME Owners

Despite increasing Internet usage in South Africa, adoption of technology within the SMME environment is still considered to be in its early stages. According to the World Bank Group's data from 2021, approximately 72% of the South African population uses the Internet (World Bank Open Data, n.d.). As at January 2024, 74.7% of South Africa's population, or 45.34 million people, were active Internet users, while around 26 million were using social media, representing about 42.8% of the total population (Statista, n.d.).

Digital technologies empower SMMEs to compete effectively with their larger, well-resourced competitors. According to NSBC Africa (2024), by leveraging digital tools, SMMEs can

provide a broader range of services at lower cost, transcending the limitations of an entirely analog environment. A recent study by the US Chamber of Commerce notes that 93% of upcoming companies that leveraged technology experienced accelerated growth, increased profitability, and enhanced hiring capacity. This underscores the significant benefits that technology can bring to small enterprises, driving their success and expansion.

However, the situation in South Africa presents a stark contrast. According to SME South Africa (2019), half of SMME owners perceive technology as a hindrance to business growth. The primary concern is the lack of stable and reliable internet access, which is crucial for leveraging technological advancements. Furthermore, only 35% of SMEs feel adequately prepared to handle disruptions, and a mere 32% are ready to embrace innovation. These statistics highlight the challenges that South African SMMEs face in integrating technology into their operations and the need for targeted interventions to support their technological adoption and readiness.

Taxes are obligatory fees charged by government on a company's earnings, individual returns and commissions. These funds are essential for the country's infrastructure and social progress. Taxes benefit the broader public, not just those directly burdened. The goals of taxation include generating returns, eliminating unfairness, regulating consumption, monitoring inflation, servicing the national debt, and guiding economic planning. For the government, maximising tax revenue is crucial, but it must also consider the impact of different tax forms on economic agents and the overall economy. Finding the right balance in terms of tax levels and simplicity can lead to the SMME sector's growth, increased competitiveness, higher levels of production, and stable government income. Judith, Maduabuchi, Igwe, Ehis, and David (2022) found that taxation significantly impacts SMMEs' profitability.

As far as the researcher's understanding, no literature has examined AI's potential role in promoting tax compliance among South African SMMEs. This study aimed to fill this research gap.

2.4 Summary

This section has examined the literature pertinent to the study, offering a thorough overview of both theoretical and empirical research pertaining to how AI can improve tax compliance among South African SMMEs. The theoretical literature included the TAM and the DOI theory. These frameworks assist in understanding how and why people adopt and use AI

technology. The empirical literature review highlighted the challenges faced by SMMEs in terms of tax compliance, the potential benefits and limitations of AI-powered tax compliance tools, and the role played by AI in normal business operations. The chapter also discussed SMMEs' perceptions of AI adoption and the current state of Internet usage among South Africans, including SMME owners. It identified the gaps in the existing literature, particularly the lack of studies examining the potential role played by AI in promoting tax compliance among South African SMMEs. This study aimed to fill this research gap.

Chapter 3: Methodology

The study employed a scoping review methodology initially recommended by Arksey and O'Malley (2005) and subsequently developed by Tricco et al. (2018). It is designed to be flexible and iterative, making it easy to replicate the search strategy and boosting the reliability of the study's findings. Scoping reviews pull together evidence from different types of studies to provide a comprehensive summary of knowledge. They help to inform practice, shape programmes and policies, and set priorities for future research (LibGuides: Systematic Reviews: Scoping Reviews, n.d.).

This study aimed to synthesise existing research on SMMEs and tax compliance and provide a thorough assessment of the evidence base. The primary focus was to investigate the significant potential that AI holds to enhance tax compliance among SMMEs by improving adherence to tax regulations.

A scoping review follows a framework that provides guidance on the optimal use of this approach. The process is as follows:

- Define the research questions
- Review relevant literature
- Choose appropriate studies
- Collect, organise and visualise the data
- Summarise, synthesise, and present the findings

3.1 Define the research questions

Three exploratory questions were formulated to address in the scoping review, namely:

- How can AI enhance tax compliance among SMMEs?
- What infrastructure is required to effectively implement AI-powered tax compliance models?
- What knowledge and skills are required for the successful implementation of AI-based tax compliance frameworks/models?

Identifying the research questions serves as a roadmap for the following stages. Clearly defining relevant aspects of each question is crucial, as they impact search strategies. Research questions are inherently broad, aiming to cover a diverse array of evidence (Levac et al., 2010).

The objectives and research questions are derived from a rapid literature review. This extensive search uncovered several key insights.

As noted previously, a scoping review is a research approach that systematically surveys and explores the existing literature on a specific topic (Westphaln et al., 2021). Its goal is to identify and summarise available evidence, clarify key concepts, and provide an overview of the current literature. Scoping reviews are particularly useful for complex topics or areas with limited prior research. They help researchers to systematically map the breadth of the existing literature and lay the foundation for more targeted research investigations.

3.2 Review Relevant Literature

The second phase of Arksey and O'Malley's framework focuses on identifying appropriate literature. This process is directed by the study's goals and research questions (Westphaln et al., 2021). A thorough search was conducted across primary bibliographic databases and grey literature to identify relevant studies on how AI could assist South African SMMEs to improve their tax compliance. The sources included Science Direct, Google Scholar, Research Gate, Google, and published reports. These search engines were selected for their diverse range of articles and the ability to directly request articles from authors, ensuring high levels of consistency, reliability, and quality while avoiding study duplication. These features improved efficiency and made for smoother full-text analysis and extraction of data.

Only studies from these specified sources were considered. To remain true to Arksey and O'Malley's framework's aim of being thorough, the research strategy covered publications from the entire relevant time period (2019 to 2024) and is relevant to the setting of interest for SMMEs. Due to time constraints, the observation period covered the period when SARS introduced the digital tax system, i.e., e-filing. During this period, the non-tax compliance gap among SMMEs was reported to have increased, partly due to changes in tax legislation and the applicable rates. In order to avoid the costs and time required for translation, only English-language literature was considered.

The data search used keywords derived from the research questions, such as "Artificial intelligence on tax compliance", "Tax compliance among SMMEs", and "Use of artificial intelligence by SMMEs for tax purposes". The search strategy was first tested on Google Scholar. Based on the number of relevant articles found, the approach was fine-tuned to make

it more effective. The final methodology was utilized for data collection from all the specified search engines.

3.3 Choose appropriate Studies

The third phase in Arksey and O'Malley's framework involves choosing appropriate literatures for the scoping review. Arksey and O'Malley recommended measures to streamline the time-consuming task of selecting studies for inclusion in a scoping study (Levac et al., 2010). The insertion benchmarks required that articles discuss tax non-compliance and AI's impact in promoting South African SMMEs' tax compliance, supported by evidence within this overarching theme. Practitioner reports, peer-reviewed articles, and professional reports, including surveys released by various organisations and accessible to the public, were considered. Only English-language papers were deemed suitable.

Pham et al. (2014) emphasised the importance of carefully scrutinising articles to avoid including irrelevant ones. Suitability was determined by examining titles and abstracts, which facilitated the collection of articles and identification of their unique characteristics. Data characterisation involved assessing the relevance of abstracts and citations. Full articles were obtained through the search engines. When titles and abstracts were insufficient, the introduction and conclusion were also reviewed to determine eligibility (Pham et al., 2014). Access to certain articles was restricted due to associated costs, such as fees required to obtain them.

To address potential bias and ensure validity in the selection process, the researcher applied a consistent set of inclusion and exclusion criteria across all sources. Although no external reviewers were formally invited to participate in the selection process, the methodology was reviewed in consultation with a research supervisor to enhance objectivity and reduce personal bias. Additionally, while a formal pilot was not conducted, the search strategy was initially tested on Google Scholar. This informal piloting phase allowed for refinement of search terms and filters, ensuring that the final approach was both effective and aligned with the study's objectives. These steps contributed to the reliability and validity of the literature selection process.

3.4 Collect, Organise and visualise the Data

In phase four of Arksey and O'Malley's framework, a descriptive analytical method is used for data charting or mapping. Unlike systematic reviews, which label this process data extraction, or meta-analyses and use specific statistical techniques, scoping reviews do not specify a clearly defined method. Arksey and O'Malley define it as a technique to amalgamate and understanding qualitative data, but do not provide detailed steps for replicating this technique (Westphaln et al., 2021).

To ensure proper organisation and traceability, all collected literature was stored electronically in a dedicated, cloud-based research folder using Google Drive. Each document was labeled using title for easy identification. This structured storage approach facilitated efficient retrieval, analysis, and ensured transparency throughout the data charting process. For this study a literature matrix was also created in Microsoft Excel to chart key information such as:

- Name of the author(s)
- Year of publication
- Study title
- Study's aims
- Sample
- Data sources
- Methodology
- Research results

Articles obtained from the searches[1]

Table 1

Articles obtained from the searches

Name of the author(s) and year of publication	**Title**	**Search Engine**	**Included/Not Included**	**Reason(s) for exclusion**

J.K. Nembe, J.O Atadoga, N.Z Mhlongo, T. Falaiye, O. Olubusola, A. I Daraojimba & B&B Oguejiofor (2024)	The Role of Artificial Intelligence in Enhancing Tax Compliance and Financial Regulation	Google Scholar	Included	Not applicable.
Maheran Zakaria, Wan Noraswaniaty Wan Ahmad, Nuraini Che Hussin, Rabaatul Azira Hassan, Marziana Madah Marzuki, Muhammad Syukur & Eka Nurmala Sari (2024)	Adoption of Tax Digitalisation Among Malaysian Tax Practitioners	Google Scholar	Not included	The study specifically focuses on tax practitioners and does not centre its attention on SMMEs, rendering it irrelevant to the research objectives.
Mphagahlele O. Ndlovu & Daniel P. Schutte (2024)	An Evaluation of Tax Compliance Among Small Businesses	Google Scholar	Not included	The study specifically evaluates the behaviour of small business owners when it comes to compliance with taxation, aiming to propose strategies for improvement. However, it does not address the role of AI in ensuring tax compliance among SMMEs. It was thus less relevant to the research objectives.
Alexander Oluka1 & Bomi Nomlala (2021)	Tax Compliance Costs and the Use of E-Filing by SMMEs	Google Scholar	Not included	The study specifically focuses on investigating the costs small business owners incur in complying with tax regulations and what motivates them to utilise the e-filing system. It does not centre its attention on the impact of Artificial Intelligence in promoting taxation

				compliance by SMMEs. These considerations rendered it irrelevant to the research objectives.
Lukundo Baseka (2022)	Factors Affecting Acceptance of the Digital Tax System on Tax Compliance Amongst Small and Medium Enterprises	Google Scholar	Included	Not applicable.
Akbari Adha, Rulinawaty Rulinawaty, & Faizal Madya (2024)	The Effect of Algorithmics Government, Artificial Intelligence, and Tax Service on Tax Compliance	Google Scholar	Included	Not applicable.
Nidal Zaqeebaa, Hamza Alqudah, Ahmad Farhan Alshira'h, Abdalwali Lutfi, Mohammed Amin Almaiahg & Mahmaod Alrawadh (2024)	The Impact of Using Types of Artificial Intelligence Technology in Monitoring Tax Payments	Google Scholar	Included	Not applicable.
Katua Celilia Mumbua (2019)	Digitization of Tax Administration, Technology and Tax Compliance by Small and Medium Sized Enterprises in Nairobi Central Business District	Google Scholar	Not included	The study was conducted in Kenya, with a focus on SMEs, with no reference to South Africa, rendering it irrelevant for the purpose of this research.
Ricardo Francisco Reier Forradellas & Luis Miguel Garay Gallastegui (2021)	Digital Transformation and Artificial Intelligence Applied to Business: Legal Regulations, Economic Impact and Perspective	Google Scholar	Not included	The study specifically focuses on a business legality point of view when it comes to AI and does not centre its attention on the role of AI in promoting tax compliance among SMMEs. These

				considerations rendered it irrelevant to the research objectives.
Dipak Jadhav (2021)	Understanding Artificial Intelligence Adoption, Implementation, and Use in Small and Medium Enterprises in India	Google Scholar	Not included	The study specifically focuses on a business operations point of view when it comes to AI and does not centre its attention on the role of AI in promoting tax compliance among SMMEs. These considerations rendered it irrelevant to the research objectives.
Caleb Watney Dirk Auer (2021)	Encouraging AI Adoption by EU SMEs	Google Scholar	Not included	The study specifically focuses on a business operations point of view when it comes to AI and does not centre its attention on the role of AI in promoting tax compliance among SMMEs. These considerations rendered it irrelevant to the research objectives.
Nompumelelo Precious Sithebe (2022)	The Relationship Between Tax Knowledge and Tax Compliance: A Survey of Small and Medium-Sized Enterprises in Durban	Google Scholar	Not included	The study specifically has its attention on examining the correlation between tax understanding and compliance with taxation regulations rather than the impact of AI in promoting tax compliance among SMMEs. These considerations rendered it irrelevant to the research objectives.

Helper Zhou, Gordon Dash & Nina Kajiji (2021)	Artificial Intelligence Function Mapping to Calibrate the Determinants of SMME Performance	Google Scholar	Not included	The study specifically focuses on a business operations point of view when it comes to AI and does not centre its attention on the role of AI in promoting tax compliance among SMMEs. These considerations rendered it irrelevant to the research objectives.
Gerda Žigien, Egidijus Rybakovas & Robertas Alzbutas (2019)	Artificial Intelligence Based Commercial Risk Management Framework for SMEs	Google Scholar	Not included	The study specifically focuses on business risk management in commercial processes when it comes to AI and does not centre its attention on the role of AI in promoting tax compliance among SMMEs. These considerations rendered it irrelevant to the research objectives.
Julia Schwaeke, Anna Peters, Dominik K. Kanbach, Sascha Kraus & Paul Jones (2024)	The New Normal: The Status Quo of AI Adoption in SMEs	Google Scholar	Included	Not applicable.
Pall Rikhardsson, Kristinn R. Thórisson, Gudmundur Bergthorsson & Catherine Batt (2022)	Artificial Intelligence and Auditing in Small- and Medium-Sized Firms: Expectations and Applications	Google Scholar	Not included	The study focuses on utilisation of Artificial Intelligence in the auditing occupation and does not centre its attention on the influence of Artificial Intelligence in promoting taxation compliance among SMMEs. These considerations rendered it

				irrelevant to the research objectives.
Rida Belahouaoui & El Houssain Attak (2024)	Digital Taxation, Artificial Intelligence and Tax Administration 3.0: Improving Tax Compliance Behavior – A Systematic Literature Review Using Textometry (2016–2023)	Google Scholar	Not included – duplication	Duplication of the above study from Research Gate.
Jinqiang Wang, Yaobin Lu, Si Fan, Peng Hu & Bin Wang (2022)	How to Survive in the Age of Artificial Intelligence? Exploring the Intelligent Transformations of SMEs in Central China	Google Scholar	Not included	The study is incomplete, and access to the full content requires payment of a fee.
Joaquim P. Silva & Joaquim Gonçalves (2022)	Process Standardization: The Driving Factor for Bringing Artificial Intelligence and Management Analytics to SMEs	Google Scholar	Not included	The study is incomplete, and access to the full content requires payment of a fee.
Rakesh Kumar, Samta Kathuria, Rupa Khannna Malholtra, Rajat Balyan, Rajesh Singh & Pradeepto Pal (2023)	Artificial Intelligence Role in Electronic Invoice Under Goods and Services Tax	Research Gate	Included	Not applicable.
Rida Belahouaoui & El Houssain Attak (2024)	Digitalization of Tax Administration and Tax Avoidance: Evidence on Tax Reform Dynamics in Morocco	Research Gate	Not included	The study is confined to the Morocco region, rendering it irrelevant for the purpose of this research.
Rida Belahouaoui & El Houssain Attak (2024)	Digital Taxation, Artificial Intelligence and Tax Administration 3.0: Improving Tax Compliance Behavior – A Systematic Literature Review	Research Gate	Included	Not applicable.

	Using Textometry (2016–2023)			
Gaofei ren (2024)	Does Enterprise Digital Transformation Reduce Tax Compliance?	Research Gate	Included	Not applicable.
Odunayo Adewunmi Adelekan, Olawale Adisa, Bamidele Segun Ilugbusi, Ogugua Chimezie Obi, Kehinde Feranmi Awonuga, Onyeka Franca Asuzu & Ndubuisi Leonard Ndubuisi (2024)	Evolving Tax Compliance in the Digital Era: A Comparative Analysis of AI-Driven Models and Blockchain Technology in U.S. Tax Administration	Research Gate	Not included	The study was conducted in the United States, with no reference to South Africa. This resulted in it being irrelevant for the purpose of this research.
Nidal Zaqeebaa, Hamza Alqudah, Ahmad Farhan Alshira'h, Abdalwali Lutfi, Mohammed Amin Almaiahg & Mahmaod Alrawadh, (2024)	The Impact of Using Types of Artificial Intelligence Technology in Monitoring Tax Payments	Research Gate	Not included – duplication	The study is a duplication of the one above.
Rotimi Oladele, Olusola Daniel Apalowowa & Bosede O. Deji Oyeleye (2024)	Digitalization of Tax Services and Tax Compliance Among Corporate Taxpayers in Nigeria	Research Gate	Not included	The study was conducted in Nigeria, with no reference to South Africa. This rendered it irrelevant for the purpose of this research.
Ali Osman Yilmaz & Mustafa Erkan Üyümez (2022)	Possible Reflections of Artificial Intelligence on Tax Inspections	Research Gate	Included	Not applicable.
Irene Chiaji, Collins Kapkiyai & Daniel Kirui (2024)	Tax System Automation and Value Added Tax Compliance; The Moderating Role of Obligation Cost	Research Gate	Included	Not applicable.

Akbari Adha, Rulinawaty & Faizal Madya (2024)	The Effect of Algorithmics Government, Artificial Intelligence, and Tax Service on Tax Compliance	Research Gate	Not included – duplication	The study is a duplication of the one above.
Joseph Kuba Nembe, Joy Ojonoka Atadoga, Noluthando Zamanjomane Mhlongo, Titilola Falaiye, Odeyemi Olubusola, Andrew Ifesinachi Daraojimba & Bisola & Beatrice Oguejiofor (2024)	The Role of Artificial Intelligence in Enhancing Tax Compliance and Financial Regulation	Research Gate	Not included – duplication	The study is a duplication of the one above.
Kaanael Simon Mbise & Lukundo Baseka (2022)	The Impact of the Digital Tax Administration System on Compliance Among SMEs	Research Gate	Included	Not applicable.
Agustine Dwianika, Irma Paramita Sofia & Ika Retnaningtyas (2023)	Tax Compliance: Development of Artificial Intelligence on Tax Issues	Research Gate	Not included	The study is incomplete, and access to the full content requires payment of a fee.
Ali Osman Yilmaz & Mustafa Erkan Üyümez (2023)	Effects of Artificial Intelligence on Tax Inspections	Research Gate	Not included	The study is incomplete, and access to the full content requires payment of a fee.
Favourate Y. Mpofu (2024)	Prospects, Challenges and Implications of Deploying Artificial Intelligence in Tax Administration in Developing Countries	Research Gate	Not included	The study is incomplete, and access to the full content requires payment of a fee.
Wael Abbas Radhi, Allam Hamdan & Ruaa Binsaddig (2024)	Assessing the Role of Artificial Intelligence (AI) on Tax Fraud Detection	Research Gate	Not included	The study is incomplete, and access to the full content requires payment of a fee.
Tushar Khinvasara, Abhishek Shankar & Connor Wong (2024)	Survey of Artificial Intelligence for Automated	Research Gate	Not included	The study is incomplete, and access to the

	Regulatory Compliance Tracking			full content requires payment of a fee.
Denis A. Zhurenkov, Artyom E. Poikin, Anton M. Saveliev & Tatiana A. Berkutova (2021)	Methods and Approaches of Artificial Intelligence in Taxation Area in the Context of the Ethical System of Post-Non-Classical Scientific Rationality	Science Direct	Included	Not applicable.
Antonio Faúndez-Ugalde, Rafael Mellado-Silva & Eduardo Aldunate-Lizana (2020)	Use of Artificial Intelligence by Tax Administrations: An Analysis Regarding Taxpayers' Rights in Latin American Countries	Science Direct	Not included	The study is incomplete, and access to the full content requires payment of a fee.
Yuhan He & Yang Yi (2023)	Digitalization of Tax Administration and Corporate Performance: Evidence from China	Science Direct	Not included	The study is incomplete, and access to the full content requires payment of a fee.

Figure 1 below illustrates the process employed to select the studies in a flow chart.

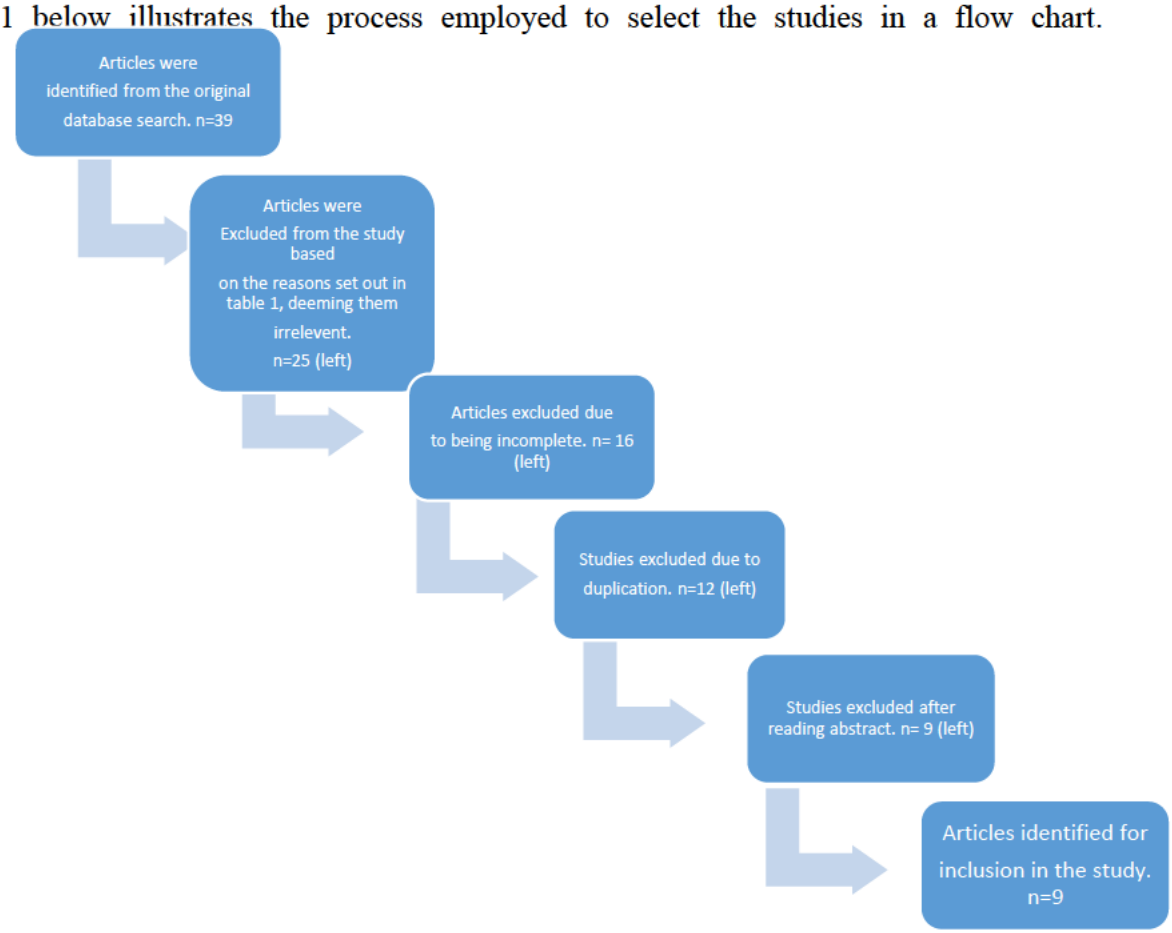

Figure 1: Selection of Articles

Note: (n) indicates the total count of articles considered in the review.

3.5 Encapsulate, analyse, and report the findings

Westphaln et al. (2021) state that stage five of Arksey and O'Malley's framework involves creating an analytical structure that defines the range of the study and highlights important focus points. This marks the final phase of the scoping review. All findings and relevant information are thoroughly summarised and compiled to draw appropriate conclusions. This phase offers a clear overview of the study and the insights gained from existing research.

All relevant data is accurately captured and analysed, providing a comprehensive synthesis of the study's outcomes. This stage not only consolidates the research, but also offers a clear and detailed overview of the study, highlighting the key insights and contributions from the existing literature and enabling well-founded conclusions to be drawn and potential areas for future

research to be identified. It ensures that the scoping review fulfils its objective of mapping the breadth of evidence on the topic.

3.6 Chapter Summary

Bhandari (2024) observes that the results section encompasses preliminary details about the participants and data, along with inferential statistics. It also presents the findings from any exploratory analyses. The results of this study are considered and analysed against the findings of previous studies and synchronised with the study's goals.

The conclusion, Arksey and O'Malley's (2005) scoping review provided a systematic, thorough approach to explore the existing literature on AI, specifically how it can promote compliance with tax regulations among South African SMMEs.

This chapter presented the research questions and discussed the process employed to select relevant studies, as well as the systematic data charting method. In adopting this approach, the aim was to offer valuable insights, identify research gaps, and inform policymakers, the tax authorities and SMMEs of the possible benefits of using AI to improve tax compliance among SMMEs. The findings will assist in crafting effective strategies to leverage AI to boost tax compliance.

Chapter 4: Scoping Review

4.1 Introduction

This chapter highlights the results of the scoping review. It scrutinises the selected studies and synthesises the information to give and highlight a comprehensive understanding of how AI can improve tax compliance among South African SMMEs. It also it explores the correlation between AI and tax compliance among SMMEs, focusing on the results for tax policy and practice. The aim is to synthesise the key insights and identify common themes, challenges, and opportunities.

Table 2

Summary of reviewed studies

Author(s)	**Title**	**Research Engine**	**Aim of the study**	**Sample**	**Technique(s)**	**Research results**
Joseph Kuba Nembe, Joy Ojonoka Atadoga, Noluthando Zamanjomane Mhlongo, Titilola Falaiye, Odeyemi Olubusola, Andrew Ifesinachi Daraojimba, & Bisola & Beatrice Oguejiofor (2024)	The role of artificial intelligence in enhancing tax compliance and financial regulation	Google Scholar	The study sought to understand how AI could help to improve the way people comply with tax regulations and financial regulation by examining recent research. It aimed to provide a thorough understanding of AI's potential impact and pinpoint key areas where it can make significant improvements.	Not stated as it is a review paper.	Review.	AI significantly enhances tax compliance by detecting fraud and predicting taxpayer behaviour through advanced data analysis. It streamlines tax administration, reducing the burden on both taxpayers and the authorities.

Lukundo Baseka (2022)	Factors affecting acceptance of the digital tax system on tax compliance amongst small and medium enterprises	Google Scholar	The primary objective of the study was to explore the issues influencing recognition of the digital taxion system and its impact on taxation compliance among small and medium enterprises in TRA Tanga.	The research focused on the population of 1,540 SMEs operational in the Tanga Region. Stratified random sampling was employed to choose a sample of 155 respondents. Of the 155 questionnaires distributed, 133 were finalised and returned, a percentage of 85.8%.	Descriptive and quantitative techniques.	The research showed that digitising tax administration boosts tax compliance amongst SMEs. Real-time data analytics help SMEs make timely remittances, reducing non-compliance risks. The digitised platform aids SMEs in analysing taxation trends and potential risks, allowing them to take the necessary precautions. The study also highlights the interdependence between technology and digitisation, emphasising the need for competent IT staff to continuously improve these platforms, thereby enhancing tax compliance and business operations.

Akbari Adha, Rulinawaty & Faizal Madya (2024)	The effect of algorithmics government, artificial intelligence, and tax service on tax compliance	Google Scholar	The research explored the impact of algorithmic government, AI, and tax services on compliance with tax regulations.	A questionnaire with five Likert Scale response options was distributed to 393 taxpayers via WhatsApp and email using Google Forms.	A quantitative methodology with a survey method.	The study revealed that algorithmic government, AI and taxation services each play a role in influencing tax compliance amongst taxpayers. When combined, these technologies can significantly enhance tax compliance. These findings highlight the potential benefits of leveraging these advanced tools to improve tax adherence.
Nidal Zaqeebaa, Hamza Alqudah, Ahmad Farhan Alshira'h, Abdalwali Lutfi, Mohammed Amin Almaiahg & Mahmaod Alrawadh (2024)	The impact of using types of artificial intelligence technology in monitoring tax payments	Google Scholar	The research explores how different types of AI technology are used to monitor tax payments and their impact on tax compliance.	120 questionnaires were distributed, with 113 accepted, while 7 were rejected.	A systematic approach to data collection, focusing on gathering information from relevant stakeholders about the opportunities, issues, and current practices related to various AI technologies	The study identifies various AI technologies, including machine learning, NLP, RPA, XAI, and advanced data analytics, and examines their use in tax payment monitoring. Each technology

					used in tax payment monitoring.	offers distinct benefits: Machine learning enhances accuracy through predictive modelling, RPA automates tasks to reduce errors, and XAI provides transparency in AI decisions. However, NLP struggles to analyse unstructured data, while advanced data analytics uncover hidden patterns to improve decision-making and compliance.
Julia Schwaeke, Anna Peters, Dominik K. Kanbach, Sascha Kraus & Paul Jones (2024)	The new normal: The status quo of AI adoption in SMEs	Google Scholar	The fundamental objective of the study is to provide an all-inclusive, thoughtful and comprehensive examination of how SMMEs adopt and implement AI.	106 peer-reviewed articles.	Systematic literature review.	This study enhances understanding of how SMEs adopt AI by analysing the interplay between technological innovation and organisational practices. It highlights the opportunities AI offers SMEs, such as

						optimising profits and improving efficiency, while also addressing challenges like financial constraints, compatibility, and legal issues.
Rida Belahouaoui & El Houssain Attak (2024)	Digital taxation, artificial intelligence and Tax Administration 3.0: Improving tax compliance behavior – a systematic literature review using textometry (2016–2023)	Research Gate	This research assesses the possible outcomes of tax digitalisation, particularly through the use of AI, machine learning, and block chain technologies, in improving tax compliance behaviour across different contexts.	62 papers from the Scopus database.	Systematic review technique with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses method.	The review highlights that going digital with AI and block chain has a significant impact in improving tax compliance, making operations more productive. However, challenges remain in using and blending these technologies in developing economies. The study highlights a global shift towards digital Tax Administration 3.0. The focus should thus be on creating strong rules, building skills, and making things simpler for SMEs.

Gaofei ren (2024)	Does enterprise digital transformation reduce tax compliance?	Research Gate	This study scrutinises how digital innovation in enterprises affects tax compliance behaviour, utilising data from Chinese listed companies between 2011 and 2022.	Not specified other than that it consisted of Chinese listed companies from 2011 to 2022.	Analyses the influence of digital transformation on taxation compliance behaviour, focusing on how digitalisation affects tax avoidance costs.	The research shows that when businesses go digital, it has an impact on their tax behaviour. Companies find it easier and cheaper to avoid taxes. This change in tax compliance is not the same for all businesses. It depends on who owns the company and how big it is. Going digital thus affects different companies in different ways when it comes to paying taxes.
Kaanael Simon Mbise & Lukundo Baseka (2022)	The Impact of the Digital Tax Administration System on Compliance Among SMEs	Research Gate	This study evaluates how the digital taxation administration system affects compliance among SMEs at the Tanzania Revenue Authority's Tanga regional office.	133 randomly selected samples from a population of 254 small taxpayers.	Case study research design utilising a quantitative methodology.	The study found that the digital tax administration system positively impacts tax compliance among SMEs in the TRA, Tanga regional office. The use of technology, including tax data analytics and electronic

						filing, enhances compliance by providing accessible tax data and streamlining the tax process. The authors recommend that SMEs continue using digital tax systems and hire IT experts for on-going support to improve compliance and business operations.
Denis A. Zhurenkov, Artyom E. Poikin, Anton M. Saveliev & Tatiana A. Berkutova (2021)	Methods and Approaches of Artificial Intelligence in Taxation Area in the Context of the Ethical System of Post-non-classical Scientific Rationality	Science Direct	The primary goal of the research is to explore the ethical implications and principles necessary for the development and implementation of AI innovation tools in the tax field in ensuring international security and stability.		A transdisciplinary approach.	The research confirms that the innovations and practical application of AI technologies in taxation and other societal areas must be guided by ethical considerations to ensure global stability and security. It emphasises the need for collaborative efforts among citizens, businesses, scientists, and governments to create an ethical framework that

						aligns with the rapid digitalisation of society.

The studies reviewed in this chapter provide a comprehensive understanding of the role of AI and digital technologies in enhancing tax compliance. Each offers important insights into the prospective advantages and challenges of using these technologies when it comes to tax administration. This commentary addresses the key questions and objectives of the scoping review, focusing on how AI can improve tax compliance, the necessary infrastructure, and the skills and knowledge required for implementation.

Joseph Kuba Nembe et al. (2024) highlight AI's transformative potential with regard to tax compliance. By detecting fraud and predicting taxpayer behaviour through advanced data analysis, AI significantly enhances compliance. The findings align with the broader literature as well as highlighting some efficiency and accuracy improvements achieved through AI adoption in tax administration. AI's ability to streamline processes and reduce administrative burdens is a recurring theme across multiple studies, suggesting strong potential to improve tax compliance rates. It can automate routine tasks, enabling the tax authorities to put their attention on more sophisticated matters. This would not only boosts overall efficiency, but also enhances the effectiveness of tax administration.

Lukundo Baseka's (2022) research on acceptance of digital tax systems among SMEs in TRA, Tanga highlights digitisation's positive impact on tax compliance. The study's high response rate and robust methodology provide credible evidence that real-time data analytics and digitised platforms help SMEs to make timely remittances and reduce non-compliance risks. The results align with other studies that highlight the crucial role of skilled IT staff and on-going enhancement of digital platforms. They also show that the integration of digital tax

systems can simplify the process of tax filing, mainly affecting SMEs through ensuring that it is accessible and takes minimal time.

Akbari Adha et al.'s (2024) study highlights new confirmation on how the integration of algorithmic government, AI, and tax services influences compliance with taxation regulations. The use of a quantitative survey methodology and the substantial sample strengthen the validity of the outcomes, which underscore that these technologies could enhance tax compliance. The findings suggest that AI can provide real-time monitoring and analysis, which helps in promptly identifying and addressing compliance issues.

Nidal Zaqeebaa et al. (2024) offer a detailed examination of the influence of various AI technologies, such as machine learning, NLP, RPA, XAI, and advanced data analytics, in monitoring tax payments. Each offers distinct benefits such as enhanced accuracy, task automation, and transparency. However, challenges like NLP's difficulty with unstructured data highlight the need for a tailored approach to AI implementation. This study's systematic approach to data collection and stakeholder engagement offers extensive perspectives on existing practices as well as opportunities in AI-driven tax compliance. It underscores the value of selecting the right AI tools to match specific tax compliance needs.

Julia Schwaeke et al. (2024) focus on SMEs' adoption of AI, identifying both opportunities and challenges. The systematic literature review provides a thorough analysis of how SMEs implement AI, optimising profits and improving efficiency while facing financial and legal constraints. This study's insights are valuable in understanding the broader context of AI adoption among small businesses and the factors that influence successful implementation. It highlights that while AI can significantly enhance operational efficiency, SMEs often struggle with the initial investment and integration costs.

Rida Belahouaoui and El Houssain Attak (2024) examine the effects of tax digitalisation through AI and block chain technologies. Their systematic review highlights significant improvements in tax compliance operational efficiency, particularly in developing economies. This study emphasises the need for strong regulatory structures as well as capacity building to support the adoption of these technologies. This aligns with the worldwide evolution towards Taxation Administration 3.0 digitalisation, which aims to modernise tax systems through advanced technologies. The findings indicate that block chain technology offers a safe and clear method to handle tax records, which helps to minimise the chances of fraud and mistakes.

Gaofei Ren's (2024) study explores how digital transformation affects tax compliance behaviour among Chinese listed companies. It offers a nuanced view of how digitalisation affects tax avoidance costs. The findings suggest that while digital transformation can reduce compliance costs, it may also reduce compliance behaviour in some contexts. This underscores the need to account for the differences among businesses when rolling out digital tax solutions. The study indicates that digital tools can make it easier for companies to find loopholes, thus necessitating stronger regulatory oversight.

Kaanael Simon Mbise and Lukundo Baseka's (2022) research on the digital tax administration system in Tanzania demonstrates its positive impact on SME compliance. The case study design and quantitative approach provide strong evidence that technology, including tax data analytics and electronic filing, enhances compliance by making tax data more accessible and streamlining processes. The study recommends continued use of digital tax systems and hiring IT experts to improve compliance and business operations. It also suggests that digital tax systems can ease the administrative concerns on SMEs, helping them to focus more on their primary operations.

Denis Zhurenkov et al. (2021) explore the ethical implications of using AI when it comes to taxation, highlighting the need for ethical principles to guide AI development and implementation. Their transdisciplinary approach highlights the importance of collaborative efforts among various stakeholders to create an ethical framework that ensures global stability and security. This study's focus on ethics is pertinent as it addresses the wider societal effects of AI and the need for responsible innovation. It underscores the importance of transparency and accountability in AI systems to develop public trustworthiness.

Incorporation of AI as well as other digital tools, for example, block chain, can create a comprehensive and efficient tax administration system. Studies like those by Belahouaoui and Attak (2024) and Zaqeebaa et al. (2024) highlight the synergies between different technologies, underlining the importance of an all-inclusive methodology for AI implementation to enhance transparency, reduce errors, and improve overall tax compliance. The findings suggest that combining AI with block chain can provide a strong structure for secure and clear tax administration.

Several studies, including those by Baseka (2022) and Mbise and Baseka (2022), highlight the need for training and capacity building for successful implementation of AI and arithmetical

taxation systems. Continuous professional development ensures that staff are equipped to handle new technologies and can effectively use AI tools. This is essential to get the most out of AI in tax administration. The research shows that on-going training programmes keep staff informed of the latest tech advancements and optimal techniques.

Adopting AI for tax compliance needs to be paired with strong measures to protect information and safeguard confidentiality. Zaqeebaa et al. (2024; 2021) highlight the critical role of protecting taxpayer data and addressing ethical concerns. Safeguarding information and confidentiality are crucial to maintain trust in AI systems and encourage their widespread use. The findings suggest that precise directives and policies are required to safeguard sensitive information and prevent misuse.

AI can greatly improve decision-making in tax administration by ffering data-driven insights and predictive analytics supports evidence-based decision-making. Research by Nembe et al. (2024) and Adha et al. (2024) shows how it could improve the precision, accuracy and efficiency of tax compliance procedures. By using AI for decision-making, the tax authorities can implement more effective strategies and interventions. The research indicates that predictive analytics can help to identify potential compliance issues before they escalate, allowing for timely corrective action.

AI-powered tools like chatbots and virtual assistants can improve taxpayer services by offering personalised, efficient support. Schwaeke et al. (2024) and Mbise and Baseka's (2022) studies highlight AI's potential to boost taxpayer satisfaction and compliance. These tools can handle a wide range of inquiries, reducing waiting times and enhancing the overall taxpayer experience. The findings suggest that they can make tax services more accessible and user-friendly, especially for SMEs.

Informing the public about the positive aspects and capabilities of AI in taxation compliance is crucial to encourage acceptance and adoption. Belahouaoui and Attak (2024) emphasise the importance of public education campaigns to address misconceptions and build trust in AI systems. Engaging with taxpayers through workshops, webinars, and informational material can promote understanding and support for AI-driven initiatives. The research highlights that effective communication strategies are essential to gain public buy-in and ensure successful AI implementation.

Guaranteeing that all taxpayers, irrespective of the size of their enterprise or technological proficiency, are able to access AI-powered tax compliance tools is also essential for equitable adoption. Baseka (2022) and Mbise and Baseka (2022) highlight the need for support and resources to bridge the digital divide. Promoting inclusivity ensures that AI's advantages are accessible to all segments of the taxpayer population. The findings suggest that targeted initiatives and subsidies can help smaller businesses and underserved communities to adopt AI technologies.

AI can support strategic planning in tax administration by providing insights into trends and forecasting future compliance issues. Studies like those by Nembe et al. (2024) and Adha et al. (2024) demonstrate its potential to enhance strategic selection or resolution. By using AI for strategic planning, the tax authorities can proactively address emerging challenges and opportunities. The research indicates that AI can help to develop more effective tax policies and improve resource allocation.

Fostering modernism within the tax authorities is essential for successful AI adoption. Schwaeke et al. (2024) and Zaqeebaa et al. (2024) note the significance of encouraging experimentation and continuous learning. A culture of innovation can drive effective use of AI and ensure that the tax authorities stay at the forefront of technological advancements. The findings suggest that innovation laboratories and pilot projects can facilitate the development and testing of new AI applications.

Collaboration between the tax authorities, technology providers, and academic institutions can drive AI innovation for tax compliance. Studies like those by Zhurenkov et al. (2021) and Belahouaoui and Attak (2024) underline the benefits of partnerships and knowledge sharing. Collaborative efforts can help to address common hurdles such as safeguarding data and cybersecurity, as well as the digital divide, by developing standardised protocols and frameworks. Partnerships can also facilitate improved new AI solutions tailored to the specific needs of the tax administration, ensuring that the solutions are both effective and practical.

Regularly monitoring and evaluating AI systems is crucial to ensure they remain effective and reliable. Nembe et al. (2024) and Adha et al. (2024) highpoint the pivotal role played by continuous assessment and feedback. By systematically evaluating AI systems, the tax authorities can pinpoint opportunities for enhancement and data adjustments. On-going

evaluation helps to ensure that AI tools remain aligned with the taxation administration's goals as well as continue to deliver the desired outcomes.

The literature analysed in this section collectively underscores the ground-breaking possibilities of AI and digital technologies in enhancing taxation compliance. They highlight various benefits such as improved fraud detection, streamlined processes, and better decision-making, while also acknowledging challenges like data privacy, the need for skilled IT staff, and the digital divide. The findings suggest that strategic, well-supported implementation of AI and digital technologies can lead to substantial improvements in tax compliance and administration. By tackling these challenges and harnessing the benefits of AI, the tax authorities can develop more efficient, accurate, and user-friendly tax systems. This, in turn, supports economic growth and stability.

In conclusion, incorporating AI for taxation compliance procedures offers significant potential to improve efficiency, accuracy, and user-friendliness. By resolving the difficulties and capitalising on the benefits of AI, the tax authorities can support SMMEs and other taxpayers in their compliance efforts, contributing to economic growth and stability. This comprehensive approach calls for a culture of continuous learning, engaging with stakeholders, promoting ethical practices, and ensuring inclusivity. This would enable the tax authorities to capitalise on AI to foster efficient and fair administration of the tax system.

4.2 The Role of AI in Tax Compliance

AI significantly enhances tax compliance by detecting fraud and predicting taxpayer behaviour through advanced data analysis. Using machine learning algorithms and big data, its systems can scrutinise huge amounts of financial data to detect trends as well as irregularities that might suggest fraud. This enables early identification of potential non-compliance, preventing it from escalating and improving overall compliance rates. The predictive power of AI also helps in understanding taxpayer behaviour, enabling the authorities to tailor their strategies and interventions more effectively.

Furthermore, AI makes tax administration processes more efficient, easing the burden on both taxpayers and the authorities. Automated systems can take care of routine activities such as data entry, filing tax returns, and managing correspondence, enabling personnel to focus on complex, strategic assignments. This not only saves time, but reduces collection costs as well

as the need for enforcement. By minimising manual errors and speeding up processes, AI ensures a smoother, more accurate tax administration system.

Integration of AI technologies leads to better resource allocation, enhanced accuracy in tax assessments, and improved taxpayer satisfaction. With AI handling the bulk of administrative tasks and fraud detection, the tax authorities can focus on policy-making and strategic planning. This holistic improvement in the tax system fosters greater trust and compliance among taxpayers, ultimately leading to a more robust and fair tax environment (Nembe et al., 2024).

4.3 Factors Influencing Acceptance of Digital Tax Systems

Digitising tax administration positively affects tax compliance among SMEs by enabling real-time data analytics and timely remittances. It enables them to better manage their tax obligations and avoid penalties for late payments. By providing instant access to financial data and automated reminders, digital tax systems ensure that SMEs can stay on top of their tax responsibilities. This not only helps maintain compliance, but also promotes a culture of accountability and transparency within the business.

Competent IT staff are required to continuously improve digital platforms. Skilled IT professionals are essential to maintain and upgrade digital tax systems, ensuring they remain efficient and user-friendly. They are able to troubleshoot, implement new features, and safeguard against cyber threats. As a result, SMEs can rely on robust digital infrastructure to streamline their tax processes, reduce errors, and focus on their core business activities.

Furthermore, the integration of digital tax systems helps SMEs to analyse taxation trends and potential risks, allowing them to take the necessary precautions. Advanced analytics tools can provide insights into tax patterns, helping businesses to forecast their tax liabilities and plan accordingly. This proactive approach minimises the risk of unexpected tax burdens and enhances financial planning. Overall, acceptance of digital tax systems is influenced by the perceived benefits and the availability of technical support, which together create a more efficient and compliant tax environment for SMEs (Baseka, 2022; Mbise & Baseka, 2022).

4.4 Impact of Data-driven Government and AI on Taxation Compliance

Automated governance, AI, and tax services each play a role in improving tax compliance among taxpayers. These technologies make tax administration more accurate and efficient,

leading to higher compliance rates. By automating routine tasks and analysing large datasets, AI systems can detect patterns and anomalies that might indicate non-compliance. This proactive approach helps the tax authorities to address potential issues before they escalate, improving overall compliance rates and ensuring a fairer tax system.

Leveraging these technologies can enhance compliance with tax by offering more personalised and timely services to taxpayers. AI-driven systems can offer tailored advice and reminders based on individual taxpayer profiles, simplifying the process and enabling them to honour their obligations. Reducing the complexity and burden of tax administration enhances taxpayer satisfaction. Timely interventions and support can prevent common errors and omissions, further boosting compliance rates.

Utilisation of AI in taxation services has the capability to identify and address compliance issues more effectively. Advanced algorithms can detect discrepancies and potential fraud with greater accuracy than traditional methods. AI and algorithmic government can transform tax administration and improve compliance rates. By integrating these innovations, the tax authorities can offer more efficient, transparent, and responsive taxation procedures that benefit both the government and taxpayers (Adha et al., 2024).

4.5 AI Technologies in Monitoring Tax Payments

AI technologies, for example, machine learning and predictive modelling, enhance accuracy in monitoring tax payments by identifying patterns and anomalies in taxpayer data. These advanced techniques allow the tax authorities to detect irregularities and potential fraud more effectively, ensuring that tax payments are accurate and timely. By analysing huge scale of data, AI can reveal movements and behaviours that traditional methods might miss. This helps to improve the overall integrity of the tax system.

Robotic process automation (RPA) handles recurrent activities, reducing human error and boosting efficiency. It can undertake tasks like data entry, processing tax returns, and generating reports quickly and accurately, enabling personnel to focus on more intricate and strategic tasks. Automation not only boosts productivity, but also ensures consistency and reliability in tax monitoring processes. However, natural language processing (NLP) struggles to analyse unstructured data, which can limit its effectiveness in certain contexts. Despite its limitations, NLP can provide valuable insights when combined with other AI technologies.

Advanced data analytics uncover hidden patterns in tax data, improving decision-making and compliance. By leveraging sophisticated analytical tools, the tax authorities can improve their understanding of taxpayer morale when identifying areas of risk. This proactive approach enables better resource allocation and more targeted interventions, ultimately leading to higher compliance rates. These technologies collectively contribute to a more robust and effective tax monitoring system, although challenges remain in fully leveraging their potential. Continuous advancements and integration of AI technologies are essential to overcome these challenges and maximise their benefits (Zaqeebaa et al., 2024).

4.6 AI Adoption among SMEs

AI offers significant opportunities to optimise tax compliance and boost efficiency among SMEs through streamlining routine tasks and delivering insights via data analysis. Using AI technologies, SMEs can streamline tax-related operations, cut down on manual errors, and make better choices by considering real-time financial data. For instance, AI-driven tools can manage tasks like tax filing, compliance monitoring, and financial reporting, freeing up personnel to concentrate on strategic initiatives. Apart from enhancing productivity, automation also ensures that SMEs stay compliant with tax regulations, reducing the risk of penalties and audits.

However, adopting AI comes with challenges like financial constraints, compatibility issues, and legal concerns. Implementing AI solutions often requires significant upfront investment, which can be an obstacle for SMMEs with limited budgets. Furthermore, integrating AI with existing financial systems can pose technical challenges, as legacy infrastructure may not be compatible with new technologies. Legal and regulatory issues, such as information safety and protection, also need to be carefully managed to ensure compliance and protect sensitive financial information.

SMEs must navigate these challenges to fully benefit from AI technologies. This involves not only safeguarding the needed financial resources, but also investing in the right infrastructure and talent. Training employees to work effectively with AI tools and ensuring that data management practices are robust and compliant with regulations are crucial. Collaboration with technology providers and industry experts can help SMEs to overcome technical and legal hurdles, making the transition to AI smoother and more effective in the context of tax compliance.

The research highlights the significance of addressing these barriers to facilitate wider AI adoption among SMEs for tax compliance. By overcoming these challenges, SMEs can leverage AI to enhance their competitiveness and operational efficiency. Embracing AI can lead to improved accuracy in tax filings, more efficient compliance processes, and better decision-making capabilities. Ultimately, successful integration of AI technologies can assist SMEs in securing long-term success and resilience, ensuring that they comply with evolving tax regulations (Schwaeke et al., 2024).

4.7 Digital Taxation and Tax Administration

The global shift towards digital tax administration calls for robust regulatory frameworks and capacity building. This new era of tax administration uses advanced technologies like AI and block chain to improve tax compliance and operational efficiency. AI can sift through huge amounts of data to spot any unusual patterns and predict taxpayer behaviour, while block chain ensures transparency and security in transactions. Together, these technologies enhance the effectiveness and reliability of the taxation system, lightening the administrative load for all parties.

However, challenges remain in adopting and integrating these technologies, particularly in emerging economies. The high costs associated with implementing AI and block chain, alongside the need for specialised skills, can be significant barriers. Furthermore, existing infrastructure in many emerging economies may not be compatible with these advanced technologies, necessitating substantial upgrades. There are also concerns about data privacy and security, which require stringent regulatory measures to address. Getting past these challenges is key to successfully implementing Digital Tax Administration 3.0.

The findings point to the necessity of simplifying digital tax systems for SMEs and ensuring that regulatory frameworks are adaptable to technological advancements. Simplified systems can help SMEs to navigate the complexities of digital taxation, making compliance easier and more accessible. Adaptable regulatory frameworks are essential to keep pace with rapid technological changes and address emerging issues effectively. This shift towards digital taxation represents a significant transformation in how tax systems operate globally, promising greater efficiency, transparency, and fairness in tax administration (Belahouaoui & Attak, 2024).

4.8 Digital Transformation's Impact on Tax Compliance

Digital transformation in businesses can reduce non-compliance by lowering the costs associated with tax avoidance. This involves acceptance of advanced technological innovations such as AI, block chain, and data analytics, which streamline operations and reduce the administrative burden. However, the ease of accessing and manipulating digital data can also create new avenues for tax avoidance. Enterprises may exploit these technologies to minimise their tax liabilities, thereby reducing overall tax compliance. This dual effect highlights the complexity of digital transformation's impact on tax behaviour.

The effect differs among businesses of various ownership types and sizes, showing that digital transformation impacts tax compliance in diverse ways. Larger enterprises with more resources may be better equipped to leverage digital tools for tax planning and avoidance, while smaller enterprises might struggle with the cost and technical challenges of digital adoption. In addition, the ownership structure of an enterprise can influence its approach to digital transformation and tax compliance. For instance, privately-owned companies might have different incentives and capabilities compared to publicly-owned ones, leading to varied compliance behaviours.

Policymakers need to consider these varying impacts when designing regulations to ensure that digital transformation supports rather than undermines tax compliance. Effective regulatory frameworks should balance the benefits of digitalisation with measures to prevent tax avoidance. This includes implementing robust monitoring systems, promoting transparency, and providing support for SMEs to adopt digital technologies responsibly. By addressing these obstacles, policymakers can capitalise on the potential of technological transformation to improve tax compliance and foster a fairer tax system (Ren, 2024).

4.9 Ethical Considerations in AI Implementation

Developing and using AI in taxation must be guided by ethical principles to ensure global stability and security. As AI becomes more embedded in tax systems, it is important to address concerns about privacy, transparency, and fairness. Ethical guidelines are crucial to protect taxpayer data and ensure that AI does not reinforce biases or inequalities. These guidelines should clearly outline how data is used, ensure consent, and maintain accountability, so that AI technologies respect individual rights and build trust in the tax system.

Collaboration among citizens, businesses, scientists, and governments is crucial to create an ethical framework that aligns with the rapid digitalisation of society. This will enable potential ethical dilemmas to be identified and addressed, ensuring that different voices are considered in the creation of AI policies. By working together, stakeholders can set standards and best practices to ensure ethical AI use in taxation. This involves making AI decision-making processes transparent and regularly auditing and updating AI systems to meet ethical standards, preventing future litigation and claims.

These measures will mitigate risks and ensure responsible and active utilisation of AI in taxation. By addressing ethical concerns proactively, policymakers can prevent misuse and build public trust in AI-driven tax systems. This approach not only improves tax administration, but also supports the broader societal goals of fairness and justice. Ultimately, a robust ethical framework for AI in taxation will support responsible innovation and sustainable development of digital tax systems, benefiting both taxation authorities and taxpayers (Zhurenkov et al., 2021).

4.10 Conclusion

This chapter presented the findings from different studies on AI's role in tax compliance. The analysis highlights AI's significant potential to increase tax compliance and facilitate tax administration, while also pointing out challenges and areas that require further research. Importantly, the chapter directly responds to the study's objectives by evaluating how AI can support tax compliance among South African SMMEs, identifying the infrastructure and skills required for implementation, and highlighting the practical implications for tax authorities and policymakers. These findings also address the research questions by demonstrating how AI tools can reduce compliance burdens and foster a culture of voluntary compliance. Ethical considerations are key to responsibly implementing AI technologies in taxation. Future research should tackle these challenges and explore new ways to use AI to improve tax compliance and administration.

Chapter 5: Closing remarks, recommendations and suggestions for future research

5.1 Introduction

This section outlines a comprehensive synopsis of the main results from the scoping review on how AI can improve taxation compliance among SMMEs. It also offers recommendations for policymakers and practitioners, as well as suggestions for future research, with a focus on the implications for South Africa. The goal is to consolidate the insights gained from the reviewed literature and propose actionable steps to leverage AI for improved tax compliance among SMMEs, addressing both opportunities and challenges.

5.2 Summary of Key Findings

The scoping review highlighted several critical aspects of AI's impact on tax compliance among SMMEs:

Enhanced Detection and Prediction: AI significantly improves detection of tax fraud and prediction of taxpayer behaviour through advanced data analysis. This enables the tax authorities to proactively address non-compliance issues and concerns, thereby enhancing overall compliance rates. AI systems can sift large volumes of scattered information to detect sequences and irregularities that might indicate fraud. This makes it easier for the tax authorities to step in early and prevent revenue losses (Nembe et al., 2024).

Streamlined Tax Administration: AI streamlines tax administration processes, reducing the administrative burden on both taxpayers and the authorities. This not only saves time, but also minimises tax collection-related costs and enforcement. Through automating tasks like data entry, handling documents and performing compliance verifications, AI provides the tax authorities with the opportunity to focus on sophisticated, pre-set tasks, rendering the tax administration system more efficient and responsive (Nembe et al., 2024).

Positive Impact on SMMEs: The use of technological innovations can positively impact taxation compliance amongst SMMEs. Real-time data analytics and timely remittances help them to manage their tax obligations more effectively. Digital tax systems provide SMMEs with tools to track their financial transactions, calculate taxes accurately, and file returns on time. This reduces the risk of errors and penalties, thereby encouraging voluntary compliance.

In addition, digital platforms simplify the tax process, making it more accessible to small business owners (Baseka, 2022; Mbise & Baseka, 2022).

Algorithmic Government and AI: The integration of algorithmic government and AI in taxation services has a noteworthy effect on tax compliance. These technologies facilitate more accurate and well-organised tax administration, leading to higher compliance rates. Algorithmic government results in predetermined procedures and AI to operate public administration processes. In the context of tax compliance, this can include automated risk assessments, personalised taxpayer services, and predictive analytics to forecast compliance trends. The study suggests that leveraging these technologies can enhance tax compliance (Adha et al., 2024).

AI Technologies and Tax Monitoring: Various AI advancements, comprising machine learning, RPA, and advanced data analytics, improve the accuracy and efficiency of monitoring tax payments. Data mining techniques can analyse past data to anticipate future compliance behaviour, while RPA can simplify repetitive tasks such as data extraction and processing. Advanced data analytics uncovers hidden patterns in tax data, improving decision-making and compliance. However, challenges remain in fully leveraging these technologies, particularly in analysing unstructured data such as text documents and social media posts. Addressing these challenges requires ongoing investment in AI research and development (Zaqeebaa et al., 2024).

Adoption Challenges in SMMEs: While AI offers opportunities to optimise profit and improve efficiency among SMMEs, challenges such as financial constraints, compatibility issues, and legal concerns must be addressed to facilitate wider adoption. Many SMMEs don't have the money to invest in advanced AI technologies or the technical know-how to set up and maintain these systems. Compatibility issues with existing IT infrastructure and concerns about data privacy and security can also hinder AI adoption. The study emphasises the need to address these barriers to encourage wider AI adoption among SMMEs. By overcoming these challenges, SMMEs can leverage AI to enhance their competitiveness and operational efficiency (Schwaeke et al., 2024).

Global Shift to Digital Taxation: The global transition towards a new era of digital Tax Administration 3.0 highlights the need for strong rules and capacity building. Using digital tools like AI and block chain makes it much easier to comply with tax regulations and promotes

smooth operations. Block chain technology can be likened to a digital ledger that everyone can see, but no one can alter. It ensures that every transaction is recorded transparently and securely, making it nearly impossible for fraud or errors to occur. This renders it a powerful tool for industries that require high levels of trust and accuracy. However, challenges remain in adopting and integrating these technologies, notably in transitioning economies with weak infrastructure and governing frameworks. The findings point to the need to simplify digital tax systems for SMMEs and ensure that regulatory frameworks are adaptable to technological advancements. The shift towards digital taxation represents a significant transformation in how tax systems operate globally (Belahouaoui & Attak, 2024).

Impact of Digital Transformation: Digital transformation can be compared to giving enterprises a high-tech makeover, making processes more efficient and transparent. This can improve tax compliance because it reduces the costs and complexities associated with tax avoidance. However, the impact is not uniform. Different types of enterprises, whether large or small, public or private, experience these changes differently, with much variation in how digital transformation affects their tax behaviour. For example, larger enterprises with more resources may be better able to exploit digital tools for tax planning and avoidance, while smaller ones may struggle to keep up with compliance requirements. Policymakers need to consider these varying impacts when designing regulations to ensure that digital transformation supports rather than undermines tax compliance (Ren, 2024).

Ethical Dimensions: The creation and use of AI technologies in taxation must be guided by ethical considerations to ensure global stability and security. Ethical frameworks are essential to address concerns related to privacy, transparency, and fairness in AI applications. Collaborative efforts among citizens, businesses, scientists, and governments are crucial to create an ethical framework that aligns with the rapid digitalisation of society. This will help to mitigate potential disadvantages and ensure that AI technologies are used conscientiously and effectively in the taxation field. Ethical considerations also include ensuring that AI procedures and tools are designed and utilised in a manner that does not discriminate against certain groups of taxpayers and that they enhance rather than undermine trust in the tax system (Zhurenkov et al., 2021).

5.3 Conclusion

Considering the outcomes, the following practical recommendations are offered to policymakers in South Africa:

Develop Robust Regulatory Frameworks: Establish all-encompassing regulatory guidelines that promote AI's integration in tax administration whilst addressing ethical considerations and privacy concerns. These frameworks should be sufficiently flexible to adapt to rapid technological changes and should include provisions for data protection, transparency, and accountability.

Boost Skills and Knowledge: Invest in capacity building among the tax authorities and SMMEs so that they are able to effectively use AI technologies. Training programmes, technical support, and resources are required to ensure that all parties understand and successfully implement AI solutions.

Encourage Collaboration: Foster collaboration between the regulatory authorities, firms, and academic institutions to identify innovative AI solutions for tax compliance. Collaborative efforts promote sharing of best practices, expansion of new technologies, and the formulation of a supportive ecosystem for AI adoption.

Support SMMEs: Provide financial and technical support to SMMEs to facilitate their adoption of digital tax systems and AI technologies. This could include grants, subsidies, and tax incentives to offset the costs of AI implementation, as well as access to technical expertise and resources.

Ensure Ethical AI Implementation: Develop guidelines and standards for the ethical implementation of AI in taxation to ensure transparency, fairness, and accountability. Policymakers should work with stakeholders to create ethical frameworks that address potential risks and ensure that AI technological tools are used with caution.

5.4 Recommendations for Practitioners

The following are some recommendations for professionals in tax administration and compliance:

Leverage AI for Fraud Detection

Utilising AI technologies to enhance detection of tax fraud and non-compliance is a critical step in modernising tax administration. AI can be likened to having a super-smart detective on one's team. It can analyse huge volumes of data quickly and well accurately spotting errors and anomalies that could point to fraud. By using advanced data analysis and predictive modelling, AI helps businesses to detect fraud more efficiently and accurately. Practitioners should invest in AI tools that can analyse huge datasets and pinpoint patterns indicative of fraudulent activities. These tools can manage huge volumes of data from different places, like financial transactions, tax returns, and even social media, to spot anything unusual or suspicious. By using machine learning algorithms, AI systems can keep learning and adapting to new fraud tactics. This proactive approach not only helps in identifying fraud, but also in preventing it by flagging high-risk activities before they escalate.

Streamline Processes with AI

Using AI to streamline tax administration can make everything run more smoothly and efficiently. AI can handle routine activities like information input, document handling, and account reconciliation, freeing up time for more important work. For example, AI operations can automatically retrieve and validate scattered information from tax forms, reducing the need for manual checks and cutting down on errors. This results in faster processing and more accurate tax filing. AI can also help to keep workflows on track, making sure that key activities are completed on timeously and that any problems are quickly fixed. By automating these processes, the tax authorities can focus on important activities like creating policies and educating taxpayers.

Enhance Data Analytics Capabilities

Investing in advanced data analytics tools is essential to uncover hidden patterns and improve decision-making in tax compliance. Practitioners should build their data analytics capabilities to better understand taxpayer behaviour and identify compliance risks. Advanced analytics unveils developments and patterns that might not be readily visible using conventional analysis techniques. For instance, data analytics can help identify sectors or regions with higher rates of non-compliance, enabling targeted interventions. By combining AI with data analytics, the tax authorities can create predictive models that forecast potential compliance issues and allocate resources more efficiently. This data-centric method makes it easier to make well-informed, knowledgeable choices and implement strategies that boost overall tax compliance.

Provide Training and Support

Offering training programmes to staff to build their skills in using AI technologies and digital tax systems is essential for proper application of AI in taxation administration. Continuous professional development ensures that staff are equipped to handle new technologies and can effectively use AI tools. Training should cover various aspects of AI, including its capabilities, limitations, and ethical considerations. Hands-on training sessions help staff to become familiar with AI-powered systems and understand how to integrate them into their daily workflows. Providing on-going support and resources such as user manuals and help desks can further enhance staff proficiency and confidence in using AI technologies. By allocating resources to training and support, the tax authorities can facilitate a seamless shift to AI-driven processes and maximise the benefits of these technologies.

Adopt a Holistic Approach

Integrating AI with other digital technologies such as block chain can create a comprehensive and efficient tax administration system. Practitioners should explore the synergies between different technologies to enhance their overall effectiveness and improve tax compliance. Imagine a world where technology works together seamlessly to make tax administration easier and more secure. Block chain can act as a safe and clear ledger for logging activities, while AI can verify the accuracy of tax filings and spot any discrepancies. This combination not only improves data security, but it also minimises the fraud risks.

Other technologies like RPA and the Internet of Things can work alongside AI by taking over repetitive tasks and offering real-time data for analysis. By adopting an all-inclusive methodology, the tax authorities can create an integrated system that leverages the strengths of multiple technologies, leading to improved tax administration and compliance.

Foster Collaboration and Innovation

Encouraging collaboration between the tax authorities, technology providers, and academic institutions can drive innovation in the utilisation of AI for taxation compliance. Partnerships enable knowledge and best practices to be shared, and the development of new AI applications that meet the specific needs of tax administration. Such collaborations can also tackle common challenges like data privacy and cybersecurity by creating standardised protocols and

frameworks. Embracing a culture of innovation and collaboration helps the tax authorities to keep abreast of emerging trends and continuously enhance their AI capabilities.

Monitor and Evaluate AI Systems

It is crucial to frequently assess and analyse AI systems in ensuring that they are working effectively as well as reliably. On-going oversight helps to identify any issues early on and ensures the AI continues to meet its goals and adapt to new challenges. The tax authorities should formulate mechanisms to assess the performance of AI tools and make the necessary adjustments. Key performance indicators (KPIs) can assist in measuring how AI impacts fraud detection, and process efficiency, and how satisfied taxpayers are. Regular evaluation helps to pinpoint areas for improvement and ensures that AI systems align with tax administration goals. Feedback from staff and taxpayers offers valuable insights into how user-friendly and effective the AI tools are, guiding future enhancements.

Address Ethical and Legal Considerations

Adoption of AI in tax compliance must be guided by ethical and legal considerations to ensure fairness and transparency. The tax authorities should create policies and guidelines that tackle issues like data privacy, algorithmic bias, and accountability. Making sure that AI systems are transparent and easy to understand is key to building trust among taxpayers and stakeholders. Legal frameworks should be updated to include leveraging AI for tax administration, setting clear rules on data usage, security, and compliance. By addressing these issues, the tax authorities can create a responsible and ethical AI ecosystem that supports effective tax compliance.

Promote Public Awareness and Engagement

Increasing public understanding of the advantages and capabilities of AI in tax compliance can enhance taxpayer engagement and cooperation. The tax authorities should communicate the advantages of AI such as improved accuracy, faster processing times, and personalised assistance to encourage acceptance and adoption. Public awareness campaigns can also address common misconceptions and concerns about AI, fostering positive perceptions of its use in tax administration. Engaging with taxpayers through workshops, webinars, and informational material can further promote understanding and support for AI-driven initiatives.

Ensure Scalability and Flexibility

AI systems should be built to scale and adapt so they can meet the changing needs of tax administration. As tax laws and regulations change, AI tools must be adaptable to new requirements and capable of handling increased volumes of data. Scalable AI solutions can grow with the organisation, ensuring long-term sustainability and effectiveness. Flexibility in AI systems also allows for customisation to adhere to the specific requirements of different taxpayer segments, like SMMEs, large corporations, and individual taxpayers. By ensuring scalability and flexibility, the tax authorities can future-proof their AI investments and maintain their relevance in a dynamic tax environment.

Utilise AI for Predictive Analytics

Using AI for predictive analytics can provide the tax authorities with valuable foresight into potential compliance issues and trends. Predictive models can analyse past data to anticipate future trends like the likelihood of tax evasion or the impact of policy changes on compliance rates. This proactive approach enables the tax authorities to implement preventive measures and allocate resources more effectively. Predictive analytics can also support strategic planning and decision-making, helping the tax authorities to stay ahead of emerging challenges and opportunities.

Enhance Taxpayer Services with AI

AI can greatly improve the way taxpayers receive support by offering personalised and efficient assistance. AI-based chatbots and virtual assistants can respond to a multitude of queries, from simple tax information to more complex compliance issues, and they are available 24/7. These tools provide instant responses, which reduces waiting times and boosts taxpayer satisfaction. Moreover, AI can analyse interactions to detect common problems and areas for improvement, helping the tax authorities to refine their services to better meet taxpayer needs.

Integrate AI with Tax Policy Development

AI can play an essential role in tax policy development by supplying evidence-based perceptions as well as recommendations. By analysing large datasets, it can identify the impact of existing policies and suggest adjustments to improve compliance and revenue collection. It can also simulate the effects of proposed policy changes, helping policymakers to make

informed decisions. Integrating AI into the policy development process can create more proficient and flexible tax policies that fulfill the needs of taxpayers and the economic environment.

Support Continuous Improvement with AI

AI can support continuous improvement in tax administration by providing immediate feedback and insights. AI tools can observe performance metrics and identify areas for enhancement, enabling the tax authorities to make data-driven adjustments. Continuous improvement initiatives should focus on optimising processes, enhancing taxpayer services, and addressing compliance challenges. By leveraging AI for continuous improvement, the tax authorities can maintain high standards of efficiency and effectiveness.

Cultivate Innovation

Building a culture of innovation within the tax authorities is key to successfully adopting AI. Staff should be encouraged to embrace new technologies and explore creative solutions, driving the effective use of AI in tax compliance. This means creating an environment where experimentation and learning are valued, and where staff feel empowered to share ideas and improvements. A culture of innovation not only enhances AI adoption, but also attracts and retains talented individuals, ensuring that the tax authorities have the skills and expertise required to leverage AI effectively.

Collaborate with International Partners

Working with international partners can offer valuable insights and best practices for using AI in tax compliance. The tax authorities can learn much from the experiences of other countries that have successfully implemented AI-driven tax systems. International collaboration can also facilitate knowledge and resources sharing, helping the tax authorities to overcome common challenges and enhance their AI capabilities. By working together, tax authorities can develop global principles and frameworks for the moral and effective use of AI in taxation.

Address the Connectivity Gap

Guaranteeing equitable access to AI tools is important for the success of AI-driven tax compliance initiatives. The tax authorities should address the digital divide by providing support and resources to SMMEs and other taxpayers that lack access to digital tools. This

includes offering training programmes, subsidies for technology adoption, and initiatives to improve digital literacy. By addressing the digital divide, the tax authorities can ensure that all taxpayers benefit from AI-driven improvements in tax compliance.

Promote Transparency and Oversight

Honesty and oversight are fundamental to build confidence in AI systems. The tax authorities should ensure that AI algorithms are clear and that their decision-making processes can be easily explained. This includes providing clear information on how AI systems work, and how utilisation of data assists in decision-making processes. Accountability mechanisms should also be in place to handle any issues or concerns that arise from using AI. By promoting transparency and accountability, the tax authorities can build confidence in AI systems and ensure that they are used ethically and responsibly.

5.5 Suggestions for Further Research

Future study should delve into several key areas to better understand how AI can enhance tax compliance amongst SMMEs:

Long-Term Impact: Conduct long-term studies to see how AI impacts tax compliance and administration over time. This will help to identify sustained benefits and any emerging challenges. Such studies will shed insights on the progression of AI technologies as well as their long-term effect on compliance behaviour.

Comparative Analysis: Perform comparative analysis across different regions and sectors to understand AI's varying impacts on tax compliance. Such studies can highlight best practices and pinpoint factors that affect AI's implementation in different contexts.

Ethical Implications: Investigate the ethical implications of AI in taxation and develop methodologies to address potential threats. Such research should focus on ensuring that AI technologies do not violate ethical morals and behaviours.

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Ethical Clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

1 October 2024
Mr Sinekhaya Bongoza (224173822)
School Of Acc Economics&Fin
Westville

Dear Mr Sinekhaya Bongoza,

Original application number: 00027123
Project title: The role of artificial intelligence in enhancing tax compliance among SMMEs: a scoping review and implications for South Africa

Exemption from Ethics Review

In response to your application received on 24 July 2024, your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,

[redacted]

Prof Claire Lauren Vermaak
Academic Leader Research
School Of Acc Economics&Fin

Turnitin Report

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