



**THE IMPACT OF ARTIFICIAL INTELLIGENCE ON TAX COLLECTION**

**THIS TOPIC FORMS PART OF A BIGGER STUDY: THE IMPACT OF ARTIFICIAL  
INTELLIGENCE ON TAX ADMINISTRATION**

by

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# ABSTRACT

## THE IMPACT OF ARTIFICIAL INTELLIGENCE ON TAX COLLECTION

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### **Background:**

Tax authorities can rely on digital technologies such as artificial intelligence to better manage taxes. Digital technologies offer an opportunity to reduce fraud and increase revenue. Digital technologies can improve tax compliance by facilitating the collection of authentic, accurate and complete information about traded goods and services, and enhancing the ability of border agents to collect the appropriate level of trade taxes.

### **Main purpose of study:**

The main purpose of this study is to understand and determine how the implementation of artificial intelligence can impact the collection of taxes.

### **Method:**

The study will make use of a mixed method in terms of reviewing literature and the use of a quantitative research methodology. A mixed studies review includes the combination of both a systematic review and the use of other methods, such as questionnaires and surveys.

### **Results:**

After analysing the various publications, it is noted that artificial intelligence and its impact on tax systems is a broad and complex issue. Authors have concluded that automation

and the use of artificial intelligence may help to improve tax compliance which will have an impact on tax collection.

**Conclusions:**

Artificial intelligence may assist tax administrators by reducing the costs involved in the traditional tax process. This may be done by reducing the lengthy process and use of complicated paperwork used in tax collection. Tax authorities may rely on the aid of AI to assist in analysing the volumes of data provided by taxpayers when filing tax returns. The success of AI adoption within the tax system is reliant on how taxpayers accept and perceive its usage.

**Keywords:** Artificial intelligence, tax administration, digitalisation, tax evasion, data analytics, tax compliance.

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## LIST OF ABBREVIATIONS AND ACRONYMS

**Table 1: Abbreviations and acronyms used in this document**

Abbreviation	Meaning
AI	Artificial Intelligence
APEC	Asia Pacific Economic Cooperation
BEPS	Base Erosion and Profit Shifting
CIAT	Inter-American Centre of Tax Administration
DAC	Development Assistance Committee
EAT	Agencia Estatal de Administración Tributaria
E-filing	Electronic filing
EY	Ernst and Young
GDP	Gross Domestic Product
HRMC	Her Majesty's Royal Commission
IOT	Internet of things
IP	Intellectual property
IRS	Internal Revenue Services
KRA	Kenya Revenue Authority
OECD	Organisation for Economic Co-operation and Development
PEoU	Perceived ease of use
PWC	Price Waterhouse Coopers
PU	Perceived Usefulness
SARS	South African Revenue Services
SPSS	Statistical Package for Social Science
UP	University of Pretoria
VAT	Value-Added Tax

## CHAPTER 1:

# THE IMPACT OF ARTIFICIAL INTELLIGENCE ON TAX COLLECTION

This mini-dissertation forms part of a bigger study on the impact of artificial intelligence on tax administration.

## 1.1 INTRODUCTION

Technology has transformed our societies and our daily lives. It can certainly be said that it has improved the way we live and influenced how businesses are run around the world (Hillyer, 2020). The use of the internet has allowed businesses to reach people all around the world by the click of a button; the technological capabilities of the internet have given all the possibilities of expanding personal and business horizons (Strauss, 2021).

Artificial intelligence (also referred to as 'AI'), as one of the technological tools available, provides businesses and tax authorities with the instrument to relieve the complexity of decision-making, as it motivates internal structural transformation. It also allows for the more complex and time-consuming tasks to be completed efficiently and effectively (Huang, 2018).

Tax revenue authorities are investing significantly in resources in the development of e-services and digital solutions. Additionally, they are taking advantage of the fast-tracking of digital transformation to improve their services, reduce burdens on taxpayers and improve tax compliance (OECD, 2021). Based on the above, the old manual way of collecting taxes has proven to be inefficient, as it indicates that the revenue authority could potentially lose out on revenue that could be collected via the use of electronic transactions.

The responsibility of revenue authorities in countries is to ensure that all taxes are collected for the benefit of that said country and its people. Efficient tax administration can help to encourage businesses to become formally registered, thereby expanding the

tax base and increasing revenues (Richard, in The World Bank, 2018). The impact of AI is important when it comes to enforcement capabilities, improving efficiency and fairness in the tax system (Fidelangeli & Galli, 2021).

## **1.2 BACKGROUND/RATIONALE FOR THE STUDY**

The history of technology is not limited to invention, development and innovation, it also includes the history of engineering and applied science (Hughes, 2001). Technology can be anything created and not-naturally occurring that improves a process, outcome or understanding. Nowadays, through increased connectivity, instant message communication and established infrastructure systems, the use of technology and new ideas are spreading extremely fast (Desjardins, 2018). Technology is involved in digital transformation, as introduced by the Fourth Industrial Revolution, to replicate a process, so it becomes more efficient and effective. The idea is to utilise technology, not only for copying an existing service in the digital form, but to also transform that service significantly (Samuels, 2021).

The introduction of the Fourth Industrial Revolution has fundamentally altered the way in which business is conducted and how people live (Schwab, 2016). Furthermore, the Fourth Industrial Revolution can be associated with exponential innovation that is changing the world and it is unmatched in comparison to the previous revolutions (Strauss, 2021). The Fourth Industrial Revolution has introduced an array of commercial activities carried out by electronic means, known as E-commerce. E-commerce has enabled efficient and affordable ways to distribute resources without the limitation of geographical boundaries. This however has resulted in the undermining of tax laws based on geographical boundaries. E-commerce has changed the distribution of taxable activities, altered the balance of taxing authorities, and resulted in erosion of countries' tax bases (Oguttu, 2017).

To address the above identified issue, on 22 May 2019, the Organisation for Economic Co-Operation and Development (OECD) Ministerial Council Meeting adopted the

recommendation on artificial intelligence. The recommendation is to encourage innovation and trust in artificial intelligence by revenue authorities to help to encourage tax compliance (Yeung, 2020).

Artificial intelligence is understood to be digital systems, often computers, and their ability to perform tasks that are commonly associated with human intelligence (Copeland, 2021).

Artificial intelligence allows machines to understand and achieve specific goals by showcasing human intelligence, to enable them to perform and achieve certain tasks (Business Standards, not dated). The definition that will be adopted is that artificial intelligence is the use of computers or associated technological programmes that are designed to make tax administration processes easier, as they limit human intervention.

Tax authorities can rely on digital technologies such as artificial intelligence to better manage taxes. Digital technologies offer an opportunity to reduce fraud and increase revenue. Digital technologies can improve tax compliance by facilitating the collection of authentic, accurate and complete information about traded goods and services, enhancing the ability of border agents to collect the appropriate level of trade taxes (Kitsios, Jalles & Verdier, 2020).

Taxation is the fees and financial obligations that are imposed by the government on its residents via the revenue authority. This process is involuntary and does not require any consent from the resident in that country (Corporate Finance Institute, not dated). Governments rely on the collection of taxes to raise revenue to supply citizens with public goods and services (Tanzi & Zee, 2001). There are a vast number of types of taxes used to generate revenue for governments. The type of taxes levied by tax authorities on individuals and businesses include income tax, Value-Added Tax (VAT), donations tax, dividends tax and estate duty, to name but a few (South African Revenue Service, 2021). Tax is the primary source of revenue for governments to support social and economic developments within their countries. The use of artificial intelligence offers innovative opportunities for governments to collect taxes (Joshi, 2020).

Around the world tax authorities are challenged with how to adapt tax administration for the collection of taxes to a global economy that is continuously transforming through digital technologies (International Chamber of Commerce, 2018). Tax administration is understood to be administration, management and supervision of the execution and application of the tax laws. Tax administration also includes the development and formulation of tax policies relating to existing or proposed tax laws. This is illustrated through the assessment, collection, enforcement, litigation, publication and statistical gathering functions under such laws (Law Insider, Not dated).

In this study the intent is to understand the impact of AI on tax collection. Impact is the force or action of one object hitting another or a powerful effect that something, especially something new, has on a situation or person (Cambridge Dictionary, not dated). An impact is the measure of an action's benefit to society and the planet (Cohen, in Kholod, 2019).

It is the researcher's understanding that the word impact is commonly used with various meanings. For this study, the researcher adopts the definition of impact as defined by the OECD and the Development Assistance Committee (DAC). Impact is the direct, indirect, intended, or unintended effects produced by an intervention (OECD & DAC, 2019).

Digitalisation poses a challenge to fair taxation and adequate tax collection. Artificial intelligence may help tax systems to mitigate those risks and strengthen the tax systems' position relative to tax evasion practices (Fidelangeli & Galli, 2021).

The purpose of this study is to establish and understand the impact that artificial intelligence has on the tax collection of a country and to make recommendations accordingly.

### 1.3 RESEARCH PROBLEM

Developing countries are faced with a big challenge when it comes to establishing systems that are tax efficient. It is also noted that in the developing countries, governments opt to exploit what is available to them instead of establishing modern tax systems that will be efficient (Tanzi & Zee, 2001:1-2). The exploitation occurs for the following reasons:

- Employment and shopping take place mainly in the informal sector, and it has proven difficult to calculate the income and consumer taxes. The informal sectors have proven difficult to quantify.
- The lack of education and training for staff and taxpayers limits the establishment of an efficient tax administration.
- Lack of reliable statistics prevents policy makers from accurately evaluating the potential impact of major changes, as small changes are preferred over major structural ones.
- Wealthy taxpayers with economic and political influence often discourage tax reforms that would increase their burdens.
- Information is not always readily available as taxpayers tend to withhold information as they feel the pinch of paying higher taxes and they try to avoid tax obligation. This tends to create avenues for tax avoidance or tax evasion.

Based on these challenges, governments in developed countries collect twice the revenue of their counterparts in developing countries.

Tax administrators mainly in African countries and developing countries have not identified effective and efficient means of administration within the current digitalised economy. This poses a risk as new challenges for tax perspectives are emerging daily due to new technological inventions and business models (Hamudi, 2020).

The Fourth Industrial Revolution has resulted in digitalisation, and this has resulted in the evolution of digitalisation using artificial intelligence (Selebogo, 2020). Digitalisation has



brought about the reliance on the use of technology. This has impacted the way in which organisations do business and introduced what is known as the “digital economy”.

In the digital economy, business leaders are starting to explore opportunities that come with investing in artificial intelligence. Artificial intelligence is improving labour productivity, by automating processes and improving on efficiencies. Improvements in productivity will drive Gross Domestic Product (GDP) gains (Damioli, Van Roy & Vertesy, 2021). Similarly, the efficiencies created by the process of automation will overflow to and improve the tax process of businesses.

The change in how business is done in the digital economy requires changes in how tax is collected. Tax authorities need to consider adopting innovative ways to collect and process financial data from taxpayers. They need to be more forward-thinking and consider moving away from the manual task to enable real-time decision-making (PWC, 2019).

The aim of this mini dissertation is to analyse the effect that artificial intelligence has on tax collection and how it will potentially affect different areas that are related to it. The effects of this phenomenon will not only be for taxpayers, but for tax authorities as well.

#### **1.4 RESEARCH QUESTION**

How does artificial intelligence impact the processes of tax collection?

#### **1.5 RESEARCH OBJECTIVE/S**

This mini-dissertation will focus on the following objective:

- To determine how the implementation of artificial intelligence can impact the collection of taxes.

The mini-dissertation is, however, part of a bigger study that includes the following objectives:

- To establish how artificial intelligence can assist in curbing tax evasion.
- To establish how data analytics could impact the process of tax administration.

## **1.6 PRELIMINARY LITERATURE REVIEW**

From the title of this study, the main constructs identified are AI, digitalisation, tax administration and tax evasion. These constructs are discussed in detail below.

### **1.6.1 Artificial Intelligence**

The potential of artificial intelligence (AI) has many possibilities that could benefit the tax function. The benefit afforded by AI is that it can process volumes of transactions within seconds, thus, giving tax professionals sufficient time to focus on value-adding activities (Ernst & Young Global Ltd, 2020).

The benefits that can be associated with AI in the tax processes through automation include:

- The reduction of duplicate work by standardising the way in which employees gather and analyse data.
- The reduction of the time spent in gathering and compiling data; therefore, deadlines will be adhered to in a short span of time.
- Identification and elimination of errors before submission to the revenue authority.
- Syncing and matching submissions in real time to the revenue authority, together with addressing and resolving possible discrepancies.

In the past, it has been a challenge for tax authorities to detect the under-reporting of income and overstated deductions by taxpayers resulting in tax losses. The use of technology solutions is assisting to better detect this tax crime (OECD, 2017). The technology that could be best suited for identifying these tax crimes could be data analytics. Data analytics is the science of analysing raw data to enable the end user to make conclusions about information (Frankenfield, 2021).

The emergence of advanced analytics and its ability to examine data or content using sophisticated approaches such as pattern recognition, outlier detection and data mining, has opened up new opportunities for the use of artificial intelligence across all aspects of tax administration (OECD, 2016).

The pressure on tax authorities to collect tax revenues has increased the reliance on digital methods for tax collection and administration. Tax authorities are responding to the pressure for tax transparency required by governments, basing their efficiency on data gathering programmes that enable matching and sharing of taxpayers' information. Data analytics is used to improve tax collections, as well as compliance from taxpayers (Ernst & Young, 2019).

Data analytics assists in identifying fraud by applying tools such as algorithms and approaches to identify trends and anomalies within volumes of complex data (Adamov, 2019).

Data analytics has been used around the world to address tax fraud issues. Below are examples of how data analytics has been used (Inter-American Centre of Tax Administration, 2021):

- The Internal Revenue Services (IRS) in the United States uses social media to identify taxpayers who live a wealthier life than what they declare in their tax records. This has saved \$300 billion in lost tax revenue.
- Her Majesty's Revenue and Customs (HMRC) in the United Kingdom relies on the connect system, which is a type of data analytics tool, to verify the reported financial information of taxpayers to other sources of data such as their bank accounts and asset ownership to establish fraudulent activity.
- The Agencia Estatal de Administracion Tributaria (EAT) in Spain makes use of data analytics to pursue wealthy taxpayers who could be moving large assets abroad for the purpose of tax evasion.

- In Costa Rica, data analytics has been used to expose simulated transactions of over \$31 million to third parties.
- The Servicio de Administracion Tributaria in Mexico uses artificial intelligence which allows it to collect volumes of data from reported electronic invoices to strengthen tax compliance.
- The Australians are developing 'ANGIE', a data analytics tool that will identify "patterns of interest" and detect new connection between taxpayers.
- The Canada Revenue Agency puts emphasis on the fight against tax evasion by continuously improving the gathering and use of data to encourage tax compliance.
- In South Korea, the revenue authority has developed a data analytics tool that analyses taxpayer's data and their connected parties to identify irregular transactions.
- The Kenya Revenue Authority (KRA) published Electronic Tax Invoice requirements. With the implementation of this system, all persons registered for Value Added Tax (VAT) are required to comply and adopt the guidelines stipulated within a period of 12 months (Kenya Revenue Authority, 2021). The implementation of Electronic Tax Invoice published by the KRA will ensure that the invoicing requirements are met and that all VAT registered persons comply, and this will effectively improve the tax collection of Kenya.

In a South African context, during the 2021 annual budget speech to Parliament, the former Finance Minister Tito Mboweni, announced that SARS would get an additional three billion rand (R3bn) for upgrades to technology and infrastructure. The windfall was mostly to focus on the prevention of transfer pricing schemes, but also to have an effect on the common eFiling system (South African Government, 2021).

The investment in technology will result in better methods for SARS to measure compliance of companies and to ensure better tax collection success. Once SARS improves its ability to measure compliance through digitalisation, it will naturally affect all taxpayers, thus increasing the need for tax management digitalisation (Konsise, 2021).

## **1.6.2 Digitalisation**

Digitalisation has changed the way in which people interact. The way in which people communicate, learn and share ideas has changed, as digitalisation has minimised time and distance as a barrier to communication (Kgonare, 2017). Digitalisation is used to describe the general integration of digital technologies into our everyday lives. This integration is referred to as “Industry 4.0”, because it encompasses the Fourth Industrial Revolution (Sarc, Curtis, Kandlbauer, Khodier, Lorber & Pomberger, 2019). Common examples of the integration of digital technologies into everyday life include the use of (i) robots in assembly lines in manufacturing; (ii) self-check-out machines at grocery stores; (iii) self-check-in counters at the airport; (iv) self-order machines found at Mc Donald’s; and (v) voice-activated assistance when you call service centres (Chand, Kostic & Reis, 2020).

Digitalisation has disrupted the way in which organisations conduct business. Consumers are now able to transact with domestic and international businesses from the comfort of their own homes, giving rise to what is now known as the “digital economy”. This change in how organisations transact has caused tax challenges. Tax administrators have had to identify an effective and efficient way to manage taxation in the digitalised economy (Hamudi, 2020).

Tax policy makers are posed with challenges on how to tax the digital economy from a direct and indirect tax perspective (OECD, 2015).

In the area of direct taxation, the following are categories of tax challenges from the digital economy:

### **1.6.2.1 Nexus**

Traditionally companies are obliged to pay taxes based on the jurisdiction where they have a physical presence. However, the digital economy has eliminated the need for a nexus to a jurisdiction, to provide goods or services to its customers (OECD, 2015). The

main tax challenges posed by the digital economy are the lack of nexus and the spread of new business models in which the customer and seller are in different jurisdictions (Hadzhieva, 2019). In taxation the term nexus is understood to be the relationship between a taxing authority and a taxpayer. There must be a link between the jurisdiction and revenue derived by the taxpayer for the taxing authority to impose tax (Murray, 2020).

#### **1.6.2.2 Data**

Information technology has become sophisticated to an extent that it has enabled companies in the digital economy to gather and use customer information across borders. Companies use the personal data of customers to feed artificial intelligence algorithms to target advertisements to relevant customers. Tax authorities currently have a challenge in attributing a value to data generated (OECD, 2015).

#### **1.6.2.3 Characterisation**

New business models that have developed from digitalisation have created uncertainties in relation to the characterisation of payments made for e-commerce transactions. Online payments from e-commerce transactions, for instance, make it difficult to establish whether a company has received payments in the course of business. This is due to an absence of an intermediary, such as banks (OECD, 2015).

The digital economy also gives rise to tax challenges relating to indirect taxation such as VAT. Base erosion and profit shifting risks relating to VAT, are due to remote digital supplies to exempt businesses and remote digital supplies in a multi-location enterprise (OECD, 2015). The lack of an effective international framework to ensure VAT collection in the country of consumption creates VAT challenges, especially when private customers purchase goods and services from companies based abroad (OECD, 2015).

### **1.6.3 Tax evasion**

The other challenges posed by the digital economy on taxation are tax evasion and tax avoidance. Although these two terms are often mistakenly used interchangeably, the terms have different meanings. Tax evasion is the deliberate misrepresentation of tax affairs by taxpayers to the tax authorities, which is illegal and fraudulent. This is done to reduce the taxpayers' tax liability. Tax avoidance on the other hand is the legal use of loopholes within the tax regime to one's advantage to reduce their tax liability (Musviba, not dated).

The meaning of tax avoidance was captured in the case involving *Ayrshire Pullman Motor Services and David M. Ritchin Vs Commissioner of Inland Revenue* when the Lord President, Lord Clyde held that: A taxpayer is allowed to use tax laws to arrange his affairs in a manner that reduces his tax liability, the same way that Inland Revenue is allowed to take advantage in collecting the maximum tax owed by the taxpayer using the same laws. Thus, tax avoidance is legal or at least not illegal, since one is mostly probably using the tax laws to limit his tax liability under the same laws (Onyeka & Nwankwo, 2016).

Tax avoidance and tax evasion have a negative impact on public revenue. Tax evasion undermines the purpose of revenue collection. It erodes governments' capacity to provide quality public goods and services to its citizens. When governments are unable to provide for the citizens' needs, this reduces morale amongst citizens and gives them little incentive to comply with their tax obligations. This phenomenon results in a disconnect between citizens and public institutions. Therefore, it is important for tax authorities to promote effective tax policies to reduce tax evasion to ensure that governments can provide quality services and goods to citizens (Pierri, Best, Blanco & Monreale, 2021).

Annual revenue losses from tax evasion and corruption are estimated to be in the billions, and the OECD encourages governments to strengthen their powers of investigating tax evasion. Governments are encouraged to promote transparency by exchanging information and their experience in curbing tax evasion (APEC/OECD, 2019).

To curb the evasion of taxation in the digital economy tax authorities can look to solutions offered by AI. One of the common purposes of AI in taxation is the prevention of tax evasion and improved services to taxpayers. When the processes are in place to improve tax compliance by way of artificial intelligence, this will assist with identifying the tax defaulters that are paying less or no tax. This can be achieved by analysing and monitoring the financial data of the individual or institution (Joshi, 2020).

#### **1.6.4 Tax Administration**

Tax policy makers are posed with challenges on how to tax the digital economy from a direct and indirect tax perspective. The daunting challenge for tax collection in the digital economy is whether governments have taxing rights in cross border transactions (OECD, 2015).

An analysis of tax administration in African countries shows that some African countries have not undertaken any meaningful preparation for the taxation of the digital economy. Only countries such as Egypt, Kenya, Nigeria, and South Africa have direct tax policies implemented. African countries are challenged with finding a balance between a tax regime that promotes investment and business continuity within the digital economy, while leveraging the tax of revenue to support economic development within their countries (Hamudi, 2020).

The evasion of custom duties, VAT and excise duty, through cross-border trade, has important tax revenue implications for both developed and developing economies (Kitsios *et al*, 2020).

Tax authorities can reduce the prevalence of cross-border fraud by using digital technologies. Digital technologies offer an opportunity to reduce fraud and increase revenue. Digital technologies can improve tax compliance by facilitating the collection of authentic, accurate and complete information about traded goods, enhancing the ability of border agents to collect the appropriate level of trade taxes (Kitsios *et al*, 2020).



Tax administration in developing countries is often characterised by interactions between tax officials and taxpayers. This is due to limited sources of data to monitor tax compliance. Therefore, tax officials are responsible for the direct monitoring of tax compliance. This however makes the tax systems in developing countries susceptible to corruption. Several developing countries have responded to this problem by introducing electronic filing of taxes. Electronic filing broadly refers to the ability of taxpayers to submit tax declaration on an online platform, thereby eliminating the in-person submission to tax officials (Okunogbe & Pouliquen, 2018).

Digitalisation has allowed tax authorities to improve tax compliance by offering services such as electronic tax filing, the pre-population of tax returns and the ability to verify completed returns. This has assisted in ensuring accuracy of taxes completed, as it allows tax authorities to reconcile tax payments, monitor revenue collection and perform tax audits using big data to assess taxpayer risk. Countries around the world have made efforts to digitalise their tax administration. Following the modernisation and automation of administrative processes in SA, the use of electronic tax submissions, customs declarations and payments have risen from 20% to almost 100% in the last decade (Kitsios *et al.*, 2020).

When using artificial intelligence in the tax function, it allows the revenue authority to expedite the collection of taxes and reduce tax evasion while providing a service to all taxpayers (OECD, 2019).

In the study the researcher will further expand on the above literature and address the objectives mentioned above. This will help to conclude on the research question, namely on how artificial intelligence will impact the tax administration process.

## **1.7 RESEARCH DESIGN AND METHODOLOGY**

### **1.7.1 Research design**

Research design is the science of arranging procedures for overseeing information that is collected and analysed to get to the most valid findings (Vogt, in Collis & Hussey, 2009:111). The research design of a research paper is important as it is the 'glue' that holds all of the elements together (Akhtar, 2016). Elements of the research design will include the empirical research methodology, the nature of the study, the time horizon, as well as the nature of the data. These elements will be briefly discussed below.

### **1.7.2 Empirical research**

Unlike conceptual research that stems from abstract theories, empirical research is based on data, experience and observations to answer a given problem (Kothari, 2004). This study aims to make use of an empirical study by collecting primary data from a questionnaire and analysing the results thereof.

### **1.7.3 Nature of study**

Studies can take place in causal, descriptive or exploratory form. A causal study tests the cause-and-effect relationship of two or more variables to determine a specific situation or occurrence (Daniel & Sam, 2010). A descriptive study is used to gather data to describe a situation and to answer a research problem. The results are usually not a definite answer, but they provide a useful insight into the theories raised. With descriptive research, observation and survey would be used in data collection (Nassaji, 2015).

An explorative study intends to discover new solutions or insights. This would normally include surveys, previously gathered data and other analyses. The current study will make use of the descriptive study approach with the use of a questionnaire and a review of previously gathered academic literature (Vithal, 2010).

#### **1.7.4 Sampling**

The focus of the study will be on South African taxpayers, who have tax knowledge and file taxes for the organisations for which they work. The study will make use of the judgemental or selective sampling approach. Judgemental sampling, also known as selective sampling, is a technique used by researchers to selectively select the units that are to be studied (Sharma, 2017). Only taxpayers with tax knowledge will be considered for the study. The unit of analysis relates to the sample of the population upon which this study will focus. This study will focus on taxpayers who are tax professionals in medium to large companies, as well as business owners with tax knowledge.

#### **1.7.5 Nature of data**

Data can be classified into primary data and secondary data. Primary data refers to data that is collected from an original source by the researcher and includes surveys, questionnaires, observation and focus groups (Collis & Hussey, 2009:73). Secondary data refers to data previously collected by other researchers. It includes academic literature, books, websites and journals (Barnham, not dated). For this study, both types will be used. The study will include the results from the questionnaire, known as primary data, as well as the information collected from published academic literature, known as secondary data. The research methodology is discussed next in relation to the research design.

#### **1.7.6 Research methodology**

A research methodology shows us the path for which one intends to carry out the research using the information that is collected (Paperpile, 2022). There are different types of research methodologies, namely qualitative, quantitative and mixed.

Qualitative research methodology involves the gathering of data in a word format rather than numbers. It can be used to understand concepts and opinions, as well as to generate

new ideas. Quantitative research methodology involves the gathering and analysis of numerical data to explain or predict a problem. The data analysis consists of numbers and statistical data and the collection of data through surveys, questionnaires, interviews, tests and experiments (Bhandari, 2022).

Mixed research methodology makes use of qualitative and quantitative dimensions. Mixed research methods may be explained as studies in which the researcher collects and analyses data, integrates the findings and draws conclusions using both qualitative and quantitative approaches or methods in a single study. One of the rationales for using a mixed method in research is that it provides a comprehensive and complete picture of the study (Doyle, Brady & Byrne, 2009).

This study will make use of a mixed method in terms of reviewing literature and the use of quantitative research methodology. A mixed study review includes the combination of both a systematic review and the use of other methods, such as questionnaires and surveys (Grant & Booth, 2009).

## **1.7.7 Research Survey**

### ***1.7.7.1 Data collection***

The study will make use of questionnaires to collect its data. A questionnaire comprises a set of questions that are sent to recipients to complete on their own, using options provided to them (Kothari, 2004). An Online Survey link will be used, namely SurveyMonkey, to distribute the questionnaire and collect data. Respondents will be recruited by privately contacting individuals on LinkedIn, as well as using the researcher's own social network.

### ***1.7.7.2 Design of the questionnaire***

The questionnaire will comprise of 2 parts. The first part of the questionnaire will be based on demographics. The second part will seek to answer the research question and the

objectives. The questionnaire will use a matrix or grid style, where each question is posed on the left side and the answer is ticked from a range of scale, with options such as Yes, No and Unsure (Saunders, Lewis & Thornhill, 2019).

#### ***1.7.7.3 Data privacy and ethical considerations***

The respondents' anonymity will remain protected, as they will not be required to disclose their names in the survey or questionnaire. Furthermore, the link is generic, and the individuals' answers are not sent to any email but rather computed into the survey.

The introduction states that the information will not be shared with external parties and the reporting of results will not affect their anonymity. Continuing with the survey will imply that the respondent agrees to give informed consent.

The introduction states that participation in the survey is voluntary, and they can opt out at any time. In addition, it states that it should take less than 5 minutes to complete.

An application for ethical clearance was submitted to the Research Ethics Committee of the Faculty of Economic and Management Sciences of the University of Pretoria, and approval to conduct research was granted.

#### ***1.7.7.4 Validity and reliability***

When conducting a quantitative study, consideration needs to be given to the results of the study and the rigour of the research. Rigour is the term used to refer to the researcher's efforts to enhance the quality of the research. Validity and reliability are used to measure this. Validity of research refers to whether the data gathered addresses the concerns raised in the research problem or constructs of the research. Reliability refers to a measure of consistency (Heale & Twycross, 2015). An example of this is that each question in the questionnaire needs to have an exact and consistent meaning for all respondents.

To ensure validity and reliability of the data from the survey, an analysis was carried out by an independent statistician. The data analysis was carried out using the statistical analysis tool Statistical Package for Social Science (SPSS).

#### ***1.7.7.5 Application of the research and reputational considerations***

The results of the research will be used for academic purposes only and for the completion of the Masters mini-dissertation and the use thereof as clearly stated in this study. The questionnaire is part of a project whereby the University of Pretoria is developing and implementing a research project focused on the impact which artificial intelligence has on tax administration for its Masters in Taxation programme. Participation in this online questionnaire is completely voluntary and will be completed anonymously. The participants cannot be identified and can answer the questions as honestly as possible. The participants can withdraw from the questionnaire at any time should they wish to do so, without having to explain why and without facing any penalties.

The participants can ask questions about the proposed study before signing consent. Participants have the rights of access to their data. The intellectual property of the University of Pretoria will not be at stake.

#### ***1.7.7.6 Access and Storage***

Data will be stored online. It will be protected on SurveyMonkey with passwords, as per their website information, which is securely stored according to best practice (Survey Monkey, Not dated). The researcher will be responsible for disposal of data after the project ends. Data will be stored for as long as it is needed for the project. Once the project is over, it will be deleted and stored for 60 days on SurveyMonkey backup systems before it is permanently deleted.

## **1.8 STRUCTURE OF THE MINI-DISSERTATION**

In this mini dissertation the results of the study conducted on the impact of artificial intelligence on tax collection will be presented. The mini-dissertation will be structured as follows:

### **Chapter 1: Introduction**

Chapter 1 provides insight and background on the rationale of the research topic: the impact of artificial intelligence on tax collection. The research problem and the research question and objectives pertaining to the topic are clearly articulated. It furthermore introduces the concept of research design and methodology, as well as a preliminary literature review. This chapter also includes a list of the abbreviations used in the mini-dissertation.

### **Chapter 2: Literature review**

Chapter 2 presents the literature on artificial intelligence and its impact on tax collection. Various constructs are identified and discussed pertaining to artificial intelligence and tax collection. The chapter concludes with deducing hypotheses from literature that are to be tested in the study.

### **Chapter 3: Data analysis and presentation of results**

Chapter 3 discusses the research design and methodology adopted in the study. The data analysis and collection process will be outlined and explained in this chapter. Hypotheses deduced in the previous chapter will be expanded on. The data collected from the questionnaire and hypotheses will be assessed and analysed, to determine how they answer the research question and objectives.

## **Chapter 4: Conclusion**

The final chapter of this study will provide a synopsis of the research process conducted from when the research problem was identified, it will reflect upon whether the research question was answered, and whether the predetermined objectives were met.



## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 INTRODUCTION**

This chapter provides an overview of literature of previous studies on artificial intelligence and taxation, to better understand how the adoption of artificial intelligence may impact tax collection. The adoption of technology is important for revenue authorities of developing countries to improve efficiency and effectiveness. By adopting technology into their systems, revenue authorities will be able to reduce tax avoidance and evasion, which will result in an increase in revenue collection (Madegwa, Makokha & Namusonge 2018).

Developing countries have three main sources used by governments to raise revenue to finance their expenditure. These include tax sources, non-tax sources and capital receipts. Tax sources comprise of all tax types levied by governments to generate revenue, and these include but are not limited to Value Added Tax, personal income tax and corporate income tax. Non-tax revenues refer to aid received from other governments, such as loans. Capital receipts are comprised of revenue from investments made by government. Amongst these three sources, taxation is the one mostly relied upon (Pantamee & Mansor, 2016).

#### **2.1.1 Tax Administration**

To generate sufficient revenue from taxation, governments rely on efficient tax administration. Tax administration is used to manage the tax system of a country. In some countries the tax administration is set-up as a department of government that works within the parameters of regulations prescribed by the countries' tax legislation. Tax administration is the process of assessing and collecting taxes from tax individuals and companies by authorities in such a way that the correct amount is collected efficiently and effectively with minimum tax avoidance or tax evasion (Maiga, 2015). To increase revenue generated from tax, governments of developing countries have implemented tax

administration reform. Tax administration reform is the amendment of a government's existing tax administration pattern and tax laws to enhance the collection of tax revenue. Governments of developing countries have employed the mechanisms of tax reform to enhance their revenue collection (Pantamee & Mansor, 2016).

One of the main pillars of tax reform is the implementation of information technology and databases. In the 21<sup>st</sup> Century tax administration is relying on advanced technologies as a tool to source data and improve tax compliance. An example of this is the use of artificial intelligence in tax reform. The use of artificial intelligence will aid the tax administrators in increasing the tax ratio, reducing tax evasion and improving tax compliance by taxpayers (Kamil, 2022).

### **2.1.2 Tax Compliance**

Tax collection is said to be the process that enables taxpayers to voluntarily comply with their tax obligations (CIAT, 2016). The compliance of taxpayers is therefore the cornerstone of tax collection. Tax compliance is an issue that has existed dating back to the introduction of tax. Tax compliance is a concept where taxpayers fulfil their tax obligations and exercise their taxation rights. Tax compliance is understood to be the payment of taxes on time and disclosure of correct tax information by taxpayers (Naeem & Gulzar, 2021). Another concern of tax compliance involves the accuracy of the information contained in the tax returns and the cost of making the tax returns (Gwaro, Maina & Kwasira, 2016).

Tax compliance can be distinguished between two types: voluntary and involuntary tax compliance. The voluntary tax compliance requires no state enforcement for the taxpayers to comply with the tax requirements in contrast to the involuntary tax compliance (Mandola, 2013). Tax compliance is concerned with the timely and accurate submission of tax remittance information to the revenue authority (Gwaro, Maina & Kwasira, 2016).

In recent times, tax administration has relied upon electronic administration by using a variety of advanced technologies as a means to source data and to improve tax compliance. The introduction of artificial intelligence through tax reform is believed to be able to increase tax revenue collection through its ability to reduce tax evasion and encourage taxpayer compliance (Kamil, 2022).

### **2.1.3 Artificial Intelligence**

Artificial intelligence is a high-tech science form of information technology used to simulate, extend and surpass human intelligence. It has been widely employed in areas such as finance, medical care, transportation, e-commerce and tax collection (Li & Zhong, 2021). Artificial intelligence came about through automation, and it is explained to be a machine's ability to perform tasks that would demand human intelligence or behaviour. Examples of such tasks are the ability to learn, understanding human speech, making good conjectures and an ability to verbalise objectives (Donepudi, 2018).

Artificial intelligence may assist tax administrators by reducing the costs involved in the traditional tax process. This may be done by reducing the lengthy process and use of complicated paperwork used in tax collection. Tax authorities may rely on the aid of AI to assist in analysing the volumes of data provided by taxpayers when filing tax returns (Shakil & Tasnia, 2022).

The application of AI in the field of taxation brings to realisation the premise of tax compliance. AI technology has enhanced the work of tax authorities and enhances taxpayers' trust in the tax system (Li & Zhong, 2021). This improves on tax compliance by reducing tax evasion which results in increased tax collection.

## **2.2 USE OF ARTIFICIAL INTELLIGENCE FOR E-FILING**

Tax authorities mainly source tax information on taxpayers from self-collection or declarations by taxpayers. Each of these methods pose their own challenges. Self-

collection requires a huge workload and taxpayer declarations pose a lot of uncertainties, resulting in inefficient tax collection. To combat inefficient tax collection, tax administrators have transformed tax collection systems from an offline system, which was a lengthy process that involved complicated paperwork, to an online system (Jing-Yi, 2019).

Globally governments are increasing their reliance on information and communication technologies to provide better public services to their citizens. The success of this initiative is derived from how citizens value the convenience and usefulness of such services. The most prominent type of electronic government service is the introduction of electronic filing (e-filing) service for taxpayers. E-filing enables taxpayers to submit their tax returns electronically to the revenue authorities (Che Azmi & Kamarulzaman, 2009). The introduction of e-filing by governments has made it easy for taxpayers to pay taxes, thus improving on taxes collected (Akitoby, 2018)

E-filing is an online service employed by tax administrators to collect taxes. The system assists taxpayers in submitting their income tax returns electronically, which is done in real time. E-filing is part of the tax reform that aims to make filing tax returns easier for taxpayers. This system provides satisfaction for taxpayers that aids in encouraging tax compliance (Kamil, 2022).

In theory, e-filing should reduce the taxpayers' costs of complying with tax regulations and increase tax revenue. The tax compliance costs may be reduced through decreasing the time and resources used by taxpayers in gathering information to file taxes. E-filing reduces the amount of time used by taxpayers to submit tax returns and reduces the turnaround time for receiving tax refunds. This system is also valuable in lowering the number of errors made when filing returns. It is also said to minimise physical human interaction with tax officials and inspectors, which reduces the risk of bribes. Lowering tax compliance costs can improve the economy and the allocation of resources, and eventually increase tax revenues for governments (Kochanova, Hasnain & Larson, 2020).

South Africa introduced e-filing in 2001 for the submission and payment of VAT and PAYE. Similar to other countries that introduced e-filing into their tax systems, the adoption of the service by South African citizens was stagnant. In the 2012 year of assessment, SARS introduced two additional features to its e-filing service. These included an e-filing mobisite application and a live online help facility that allowed taxpayers to submit tax returns using their mobile devices (Jankeeparsad, 2013).

The implementation of the e-filing system was found to have a positive effect on taxpayer compliance. The quality of the service offered by tax authorities and understanding of tax regulations by taxpayers partially affect taxpayer compliance (Kamil, 2022).

The e-filing system is said to have a direct impact on the levels of tax compliance. The system ensures that the taxpayers have correctly filled in all of the required mandatory fields before allowing them to proceed to the next level. The effect of this ensures that the data received by revenue authorities is of high-quality compared to the data received from manual returns. An online filing system ensures that there is a lack of inconsistencies, missing information and unintentional errors by taxpayers (Gwaro, Maina & Kwasira, 2016). Tax administrators rely on information technology tools that allow for the cross-referencing of information and the use of intelligent information processing to better detect inconsistencies in the tax returns submitted, identify missing tax returns and late payments (CIAT, 2016).

### **2.3 ARTIFICIAL INTELLIGENCE FOR THE IMPROVEMENT OF TAX COLLECTION AND ADMINISTRATION**

The development of artificial intelligence offers tax professionals tools such as forecasting, clustering, and a virtual support system, that provide convenience and improve efficiency. Artificial intelligence can be used in the tax administration process to eliminate repetitive tedious tasks such as processing documents and reviewing filed returns to identify correctness and to identify errors resulting in non-compliance (Rathi,

Sharma, Lodha & Srivastava 2021). This will then alleviate pressure on tax administrators to focus on analysing the identified transactions, instead of sifting through information.

Artificially intelligent robots are able to assist tax authorities in detecting errors, classifying accounts and transactions, assessing and identifying tax audit risks, and increasingly proposing tax strategies within the framework of complex global laws (Bevacqua, 2021).

KPMG, one of the prestigious accounting firms, launched the “Tax Service”, an intelligence tax product that assists Chinese companies to solve automated tax compliance problems. China is one of the countries with a complex tax system that has frequent policy changes. The omission of tax information during the tax declaration process could result in serious tax risks and consequences. The use of the “Tax Service” aids in avoiding these risks by its ability to conform to policy requirements in the declaration process. Additionally, the “Tax Service” product can perform automatic preparation of VAT and corporate income tax returns, as well as local additional tax calculation tables, trend analysis, and the timely detection of potential errors, risks, or abnormal conditions (Huang, 2018).

Governments are promoting the use of AI to drive the collection of taxes by increasing flexibility for taxpayers through chatbots and virtual voice assistance. The Singapore Inland Revenue Service (IRAS) uses “Joanna”, a chatbot used to answer queries from taxpayers. Joanna is also able to automatically identify application forms for tax authorities, discriminate between tax rates in different forms applicable to tax authorities, and assist taxpayers to accurately fill in and track service requests (Li & Zhong, 2021).

The application of AI technologies improves tax inspection, and efficiently evaluates and reduces tax risk. It can also be attributed to the improvement of tax collection and administration. AI also has the ability to optimise the allocation of manpower and resources.

## **2.4 TECHNOLOGY ACCEPTANCE MODEL**

An important measure of the success of artificial intelligence within tax administration is to evaluate whether taxpayers have accepted it. Technology acceptance is derived from psychology-based theories of reasonable action and planned behaviour (Marangunic & Granic, 2013). The theory assumes that an individual's perception or attitude towards technology influences their use of the technology (Cakmak, Benk & Budak, 2011).

The technology acceptance model (TAM) states that technology acceptance is dependent on the technology users' perceived ease of use (PEoU) and the technology's perceived usefulness (PU). PEoU refers to the extent to which the technology user believes that using a new information system requires minimal effort. PU on the other hand is the degree to which a user believes that the new information system would be useful in enhancing the efficiency of performance of their task (Udo, Gupta, Bagchi & Zaidi, 2015).

In the context of AI technology, perceived usefulness refers to the notion that the more taxpayers believe in its usefulness, the higher the possibility of them using it. In contrast, perceived ease of use suggests that the easier the taxpayer perceives the use of systems with AI technology, the more likely they are to use these systems.

### **2.4.1 Hypothesis**

To determine how the implementation of artificial intelligence can impact the collection of taxes, the following hypotheses have been developed from the analysis of the literature and the questions used in the survey.

Hypothesis 1: There is an association between the filing of returns online and the use of online payment methods offered by revenue authorities.

Hypothesis 2: There is no association between respondents who file returns online and their perception of artificial intelligence being able to assist in the collection and payment of taxes.

Hypothesis 3: There is an association between respondents who make use of online payment methods offered by revenue authorities and their perception on whether artificial intelligence could assist in the collection and payment on tax.

Hypothesis 4: There is an association between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online methods to file returns.

Hypothesis 5: There is an association between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online payment methods offered by revenue authorities.

In the next chapter the data collected from the survey is analysed through the use of a statistical analysis tool and the above derived hypotheses are explained in detail.



## **CHAPTER 3: DATA ANALYSIS**

The objective of this study is to evaluate and understand the impact which artificial intelligence has on tax collection. A survey was used to gather taxpayers' understanding and acceptance of artificial intelligence, technology, or data analytics in the tax administration process. The survey was conducted as part of a bigger study that aims to understand the impact which artificial intelligence has on tax administration.

A total of 97 survey responses were received and the data was captured. The quantitative data gathered was analysed by using descriptive statistics and inferential statistics. The descriptive and inferential techniques were used to determine differences and relationships between variables of the survey to test the hypotheses. The analysis was carried out by a statistician and independent researcher. The data analysis was carried out using the statistical analysis tool Statistical Package for Social Science (SPSS).

This chapter provides the detailed data analysis of all of the data collected from the surveys in relation to the objective aiming to understand the impact of artificial intelligence on tax collection.

### **3.1 DESCRIPTIVE STATISTICS**

Descriptive statistics is a technique used to describe and summarise the characteristics of data collected from a survey. Descriptive statistics also provides a useful strategy for summarising data and providing a description of the sample but cannot provide information for causal analysis (Marshall & Jonker, 2010). The nominal level of measurement was used for the demographic questions.

### **3.2 DEMOGRAPHICS**

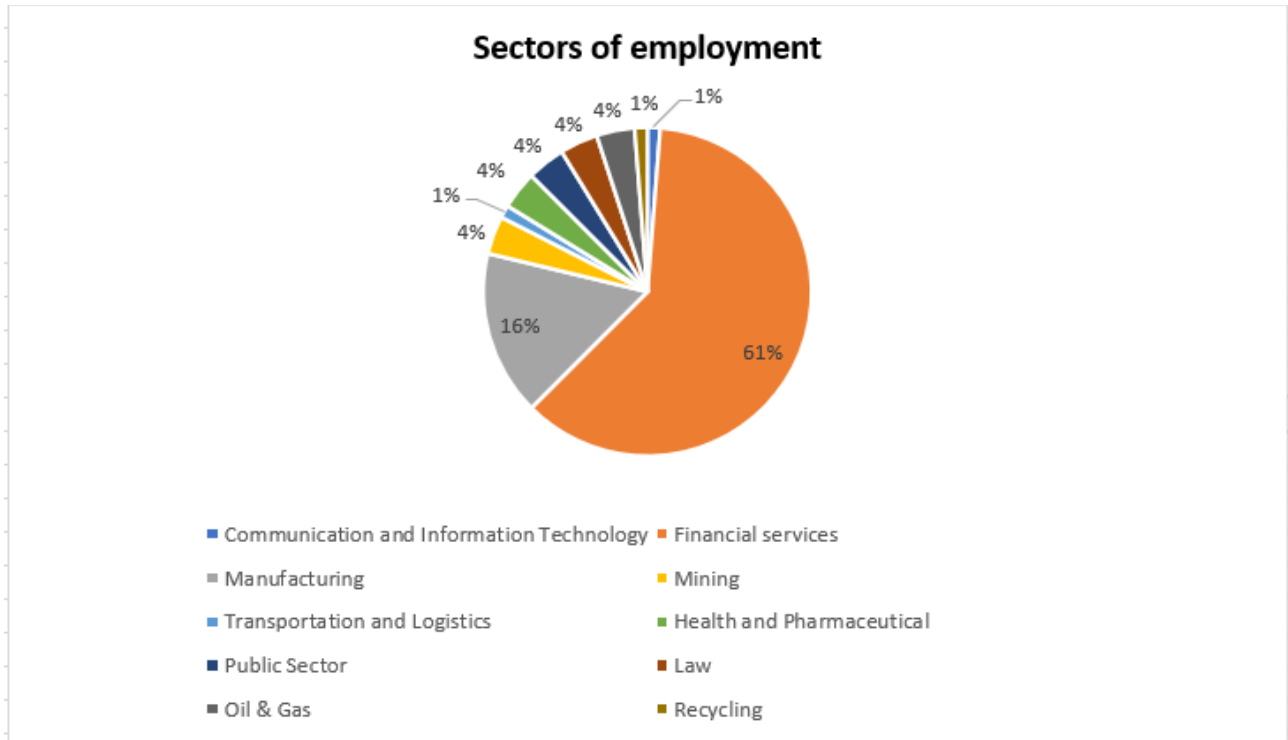
Judgemental sampling was used in the study. Judgemental sampling, also known as selective sampling, is a technique used by researchers to selectively select the units that are to be studied (Sharma, 2017). The unit of analysis for this study focused on taxpayers who are tax professionals as well as business owners with tax knowledge.

The researcher used frequency tables to display this data. The researcher targeted tax professionals. The survey was answered by 97 participants. Seventeen of the responses were disqualified as they were not tax professionals as required. The remaining qualifying responses were categorised into sectors of profession in table 2.

**Table 2: Sectors of Profession**

<b>Sector</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Cumulative present</b>
Financial services	42	52.5	52.5
Manufacturing	13	16.3	68.8
Communication and Information Technology	1	1.3	70.1
Mining	3	3.8	73.9
Transportation and Logistics	1	1.3	75.2
Other	20	25	100
Total	80	100	

The above table provides a snapshot of the results of the sectors of employment chosen by the participants. Fifty-two-point five percent, which is seen to be the majority of the participants, were employed in the financial services sector. The second largest group identified as “other”. Participants who selected “other” did not see themselves in any of the provided industries that have been mentioned. Participants who selected “other” were requested to specify in which category they were employed. This data was grouped and categorised into the given sectors. Figure 1 below shows all of the categories in which the tax professionals are employed in a pie chart.



**Figure 1: Sectors of employment**

- 61% of the participants are tax professionals in the financial services sector
- 16% of the participants are tax professionals in the manufacturing sector
- Tax professionals in the mining, law and health sector amount to 16% of the participants
- 7% of the participants fall within various sectors such as law, the public sector and transportation

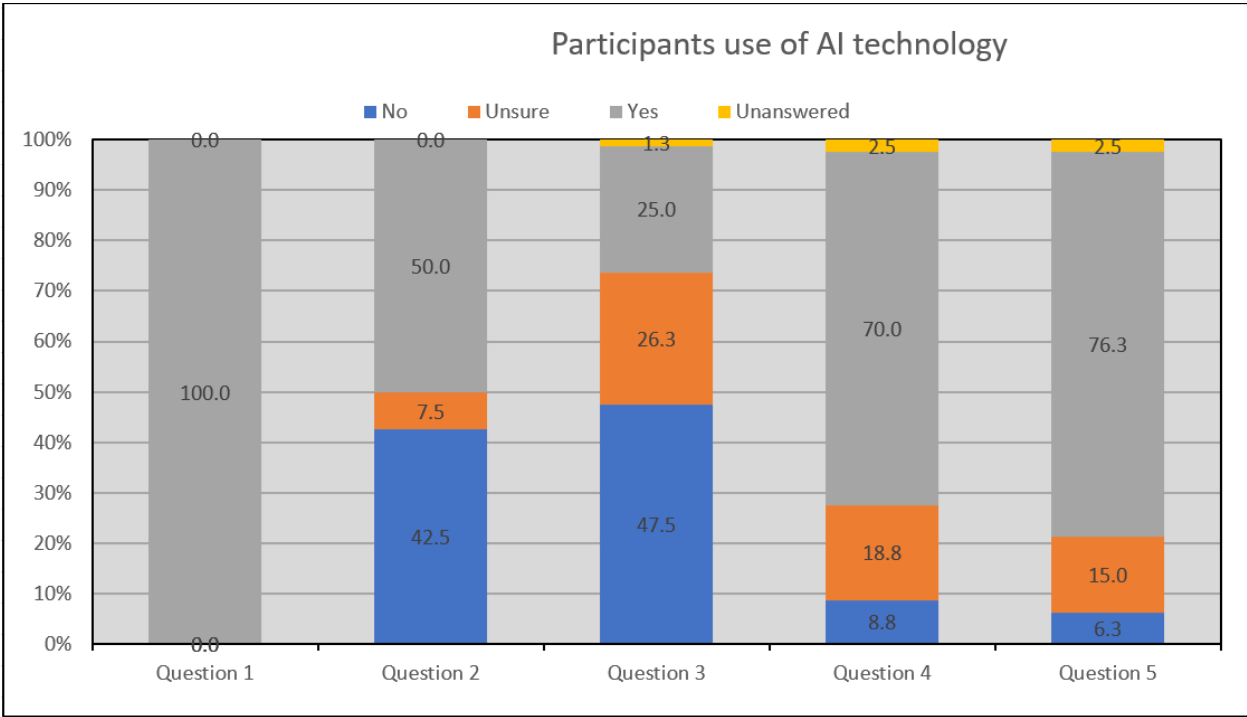
The above findings are of significance as they indicate that the participants in the study are individuals with work experience in the field of taxation.

**Table 3: Population**

<b>Tax knowledge in jurisdiction other than South Africa</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Cumulative percent</b>
Yes	43	53.75	53.75
No	35	43.75	97.5
Unanswered	2	2.5	100
Total	80	100	

Table 3 above shows that only 53.75% of the survey population indicated that they have tax knowledge in a jurisdiction other than South Africa, whilst 43.75% indicated that they do not. A minority of 2.5% of the population did not answer the question. This is of importance as it shows the researcher that participants are aware of tax administration in other jurisdictions. Therefore, this does not limit the research to the South African tax jurisdiction only.

Section Two of the survey aimed to identify the usage of AI technology. The below graph illustrates the findings from the survey. Refer to the survey in the Appendix for questions asked in the horizontal axis of the graph.



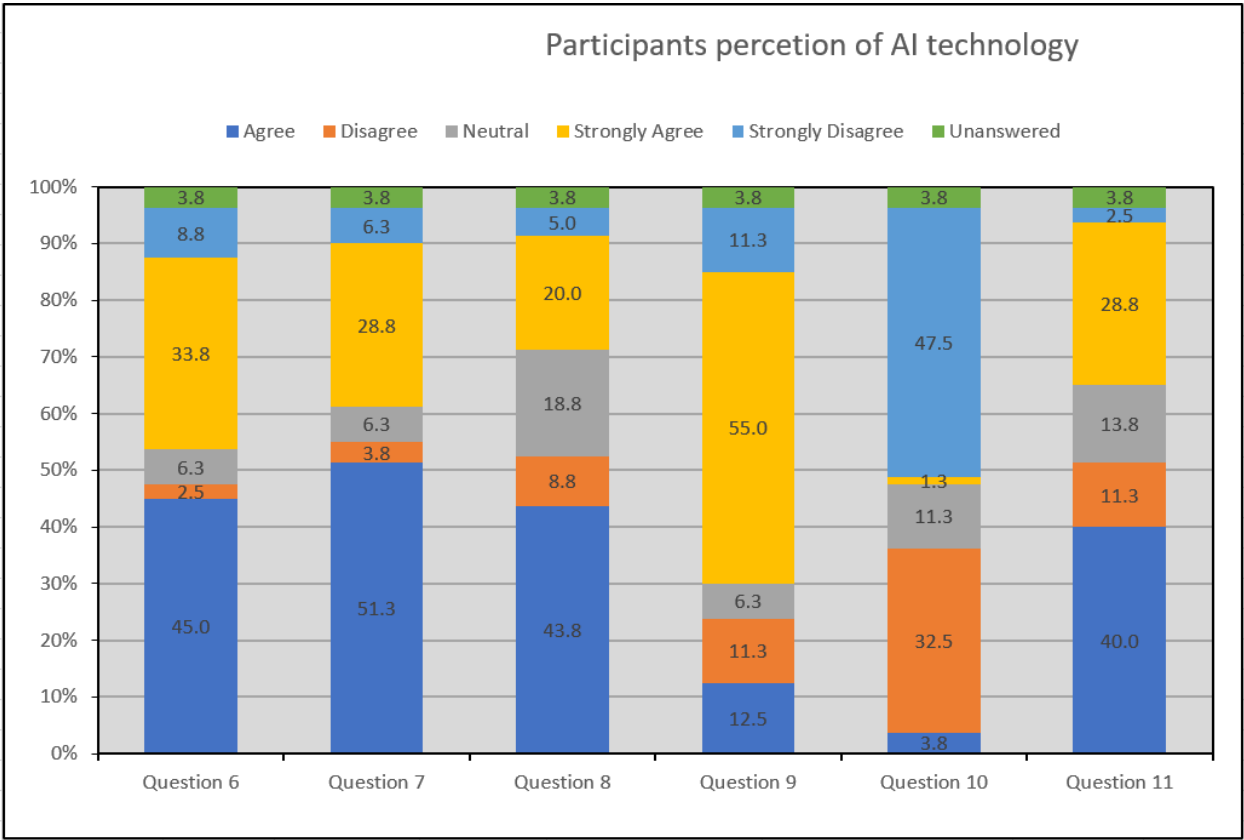
**Figure 2: Participants’ use of AI**

The above figure indicates the following findings:

- That of the total participants in the survey, 100% said that their organisations use e-filing platforms to submit tax returns.
- There is an equal amount of participants whose organisations submit tax returns in other countries besides South Africa.
- The precondition set in Question 3 was ignored, as the graph indicates a higher value of responses in this question from those who indicated yes in Question 2. This indicates that the majority of the participants do not file returns manually.
- Similar to Question 3, participants ignored the precondition set out in Question 4. The majority of the participants, 70%, said yes to using online platforms to submit taxes.
- Most of the participants used online payment methods offered by revenue authorities to pay taxes.
- A minority, less than 3% of the participants, did not answer Question 3, Question 4 and Question 5 of the survey.

The above stated findings indicate that participants to the survey do make use of technology systems offered by revenue authorities in their tax administration. The existence of a significant association between these constructs will be tested below.

Section Three of the survey aimed to identify the participants' perception of AI technology. The below graph illustrates the findings from the survey. Refer to the survey in the Appendix for questions asked in the horizontal axis of the graph.



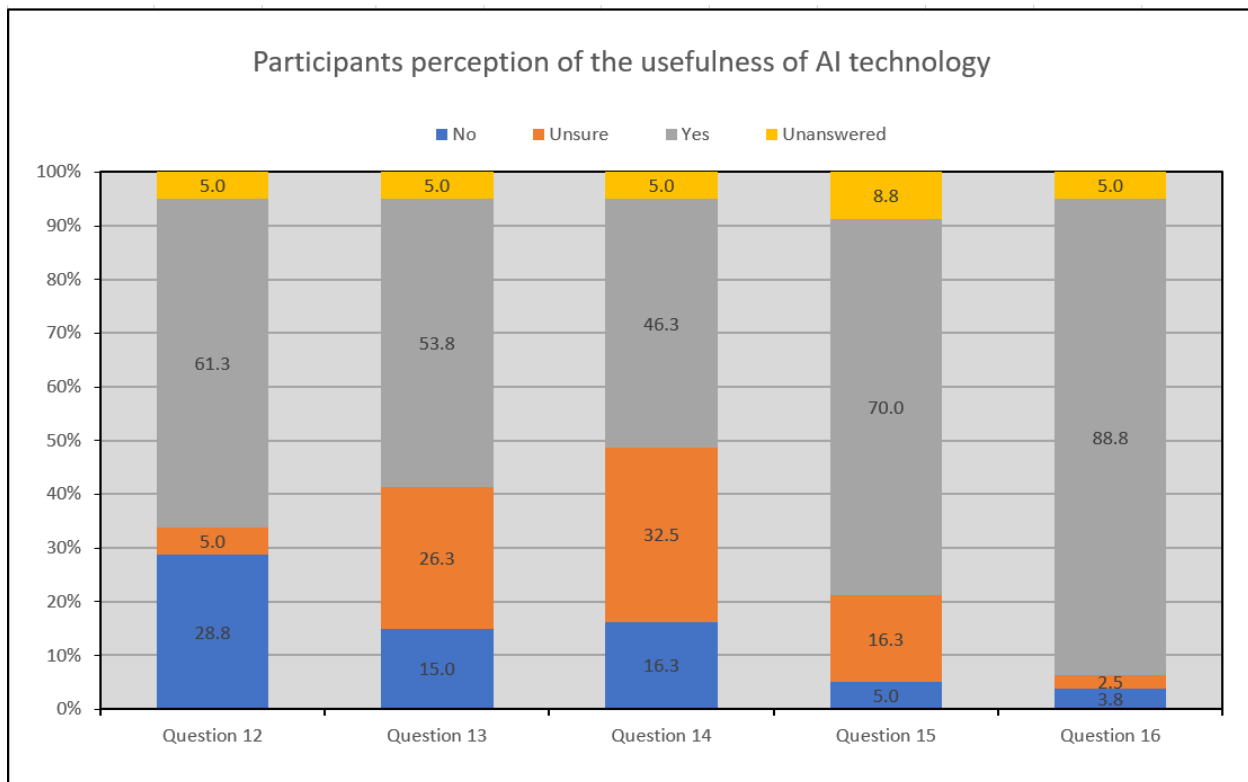
**Figure 3: Participants' perception of AI**

The above graph indicates the following significant findings:

- The combination of the participants who answered agree and strongly agree to the statement “artificial intelligence could assist in the collection and payment of taxes” amounts to 78.8%. This indicates that the majority of the participants are in favour.

- A total of 80.1% of the participants are in agreement that the use of technologies would assist in reducing errors in submission and payments of taxes.
- With regard to the question enquiring whether artificial intelligence could help in curbing tax evasion, 68.8% of the respondents agreed, whilst 13.8% of the respondents disagreed with this statement, and 18.8% were neutral.

Section Four of the survey aimed to identify the usage of AI technology. The below graph illustrates the findings from the survey relating to this section. Refer to the survey in the Appendix for questions asked in the horizontal axis of the graph.



**Figure 4: Participants’ perception of usefulness of AI**

The above figure shows responses by the respondents regarding the use of data analytics within tax software.

- Of the participants that responded to this question, 61.3% responded that their organisations use tax software. Although the number of yes responses was more than half of the respondents, the value was not substantially significant.
- Of the participants, 58.3% agreed that tax software saved them time in completing their tasks. This question had a precondition that participants respond, should they have answered yes to the previous question, Number 12.
- Interestingly, only 46.3% of the participants said that tax software aids in tax compliance. The majority of the participants said no or were unsure.
- The Question 15 graph had a precondition that of the participants that said that their organisations don't use tax software, would they consider using them? Seventy percent of the participants responded yes.
- The majority of the participants agreed that tax software systems are beneficial in achieving tax efficiency/compliance.

### **3.3 INFERENCE STATISTICS**

The results from the questionnaire were also analysed using the inferential statistics technique. This technique offers researchers the opportunity to test the relationship between data to test hypotheses or make conclusions based on statistical evidence (Doucette, 2017). This technique was carried out by making use of the following methods:

#### **3.3.1 Cross Tabulation**

Cross tabulation is a basic tool used for empirical research. It is used to test hypotheses about the contingency between two or more variables. They are usually presented in a matrix called a contingency table. Whereas a frequency distribution table describes the distribution of one variable, a contingency table describes the distribution of two or more variables simultaneously. It merges two or more frequency distribution tables into one. Each cell gives the number of respondents that gave that combination of responses, that is, each cell contains a single cross tabulation (White & Korotayev, 2004).



### **3.3.2 Statistical Significance**

To determine whether the variables identified using the cross tabulation influence each other, the researcher identified whether the association was statistically significant. The significance level of a test is defined as the probability (p value) of deciding to reject the null hypothesis when the null hypothesis is true (a decision known as a Type 1 error). If the p-value is less than the significance level, then the null hypothesis is rejected. In this study, both 5% and 10% as levels of statistical significance were considered (Storey & Tibshirani, 2003).

### **3.3.3 Association Tests for Cross Tabulations (r x c contingency tables)**

The statistical test used is the Pearson chi-square test of independence, and this is used when both variables are nominal. It is used to calculate the probability that a relationship found in a sample between two variables is due to chance (random sampling error). It does this by measuring the difference between the actual frequencies in each cell of a table and the frequencies one would expect to find if there were no relationship between the variables in the population from which the sample has been drawn. The larger these differences are, the less likely it is that they occurred by chance (Pallant, 2020).

In addition, the Pearson chi-square test for independence is considered to be too liberal if more than 20% of cells had an expected frequency of less than 5% is stated at the bottom of the table with the above test result or if some of the expected counts is less than 1. Thus, in this case, the Fisher-Exact test (for 2 by 2 tables) or the Fisher Freeman Halton (FFH) test were used. These tests are "exact" because no large-sample approximations were used and provided an exact p value that is valid regardless of the sample size (Lydersen, Pradhan, Senchaudhuri & Laake, 2007).

### **3.3.4 Cramer's V**

Cramer's V is used to measure the strength of the association between two nominal variables (Pallant, 2020).

## **3.4 CRITICAL ANALYSIS OF THE SURVEY RESULTS AND HYPOTHESIS USING INFERENCE STATISTICS**

### **3.4.1 Hypothesis 1: There is an association between filing returns online and the use of online payment methods offered by revenue authorities.**

The following questions tested this hypothesis:

Question 4: If you answered yes to Question 2, asking whether your organisation submits returns in any country other than South Africa, is the return submitted on an online platform?

Question 5: If you answered yes to Question 4, does your organisation make use of online payment methods offered by the revenue authority?

The precondition requesting the respondent to answer Question 5 if they answered yes to Question 4, appeared to have been ignored by the respondents. (Some respondents who answered no or unsure in Question 4, answered yes to Question 5).

S2Q4 * S2Q5 Crosstabulation						
			S2Q5			Total
			No	Unsure	Yes	
S2Q4	No	Count	5	0	2	7
		% within S2Q4	71.4%	0.0%	28.6%	100.0%
		% within S2Q5	100.0%	0.0%	3.3%	9.0%
	Unsure	Count	0	10	5	15
		% within S2Q4	0.0%	66.7%	33.3%	100.0%
		% within S2Q5	0.0%	83.3%	8.2%	19.2%
	Yes	Count	0	2	54	56
		% within S2Q4	0.0%	3.6%	96.4%	100.0%
		% within S2Q5	0.0%	16.7%	88.5%	71.8%
Total	Count	5	12	61	78	
	% within S2Q4	6.4%	15.4%	78.2%	100.0%	
	% within S2Q5	100.0%	100.0%	100.0%	100.0%	
Chi-Square Tests						
		Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	
Pearson Chi-Square		90.957 <sup>a</sup>		0.000	0.000	
Likelihood Ratio		57.660	4	0.000	0.000	
Fisher-Freeman-Halton Exact Test		51.766			0.000	
N of Valid Cases		78				
a. 5 cells (55,6%) have expected count less than 5. The minimum expected count is ,45.						
Symmetric Measures						
		Value		Asymptotic Significance	Exact Significance	
Nominal by Nominal	Phi	1.080		0.000	0.000	
	Cramer's V	0.764		0.000	0.000	
N of Valid Cases		78				

**Figure 5: Inferential statistics on hypothesis 1**

**Table 4: Cross tabulation on hypothesis 1**

Cross-tabulation variables	Pearson-chi-square test statistics	Fisher or FFH test (if applicable)	Significance (p-value)	Result
Question 4 and Question 5		0.000	0,764	Do not reject the hypothesis at the 5% or 10% level of significance

The results indicated that as the significance value was below 0.05, statistically significant association between filing returns online and the use of online payment methods offered

by revenue authorities exists. A similar pattern was observed for both groups as, of the respondents that selected yes to Question 4, 96.4% answered yes to Question 5. Seventy-one point four percent of the respondents that answered no to Question 4, also answered no to Question 5. The strength of the association (0.764), as measured by Cramer V, is indicative of a very strong, negligible effect as the degrees of freedom is 4  $((3-1) * (3-1))$ .

### **3.4.2 Hypothesis 2: There is no association between respondents who file returns online and their agreement to the statement “artificial intelligence could assist in the collection and payment of taxes”.**

The precondition requesting the respondent to answer Question 4 if they answered yes to Question 2 appeared to have been ignored by the respondents. (Some Respondents who answered no or unsure in Question 2, answered yes to Question 4).

The following questions tested this hypothesis:

Question 4: If you answered yes to Question 2, asking whether your organisation submits returns in any country other than South Africa, is the return submitted on an online platform?

Question 6: Artificial intelligence could assist in the collection and payment of tax.

S2Q4 * S2Q6 Crosstabulation									
			S2Q6						
			Agree	Disagree	Neutral	Strongly agree	Strongly disagree	Total	
S2Q4	No	Count	3	0	0	2	2	7	
		% within S2Q4	42.9%	0.0%	0.0%	28.6%	28.6%	100.0%	
		% within S2Q6	8.8%	0.0%	0.0%	7.4%	28.6%	9.3%	
	Unsure	Count	8	0	3	3	1	15	
		% within S2Q4	53.3%	0.0%	20.0%	20.0%	6.7%	100.0%	
		% within S2Q6	23.5%	0.0%	60.0%	11.1%	14.3%	20.0%	
	Yes	Count	23	2	2	22	4	53	
		% within S2Q4	43.4%	3.8%	3.8%	41.5%	7.5%	100.0%	
		% within S2Q6	67.6%	100.0%	40.0%	81.5%	57.1%	70.7%	
Total	Count	34	2	5	27	7	75		
	% within S2Q4	45.3%	2.7%	6.7%	36.0%	9.3%	100.0%		
	% within S2Q6	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
Chi-Square Tests									
		Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)				
Pearson Chi-Square		10.919 <sup>a</sup>	8	0.206	0.201				
Likelihood Ratio		9.876	8	0.274	0.320				
Fisher-Freeman-Halton Exact Test		9.102			0.248				
N of Valid Cases		75							
a. 11 cells (73,3%) have expected count less than 5. The minimum expected count is ,19.									
Symmetric Measures									
		Value	Approximate Significance	Exact Significance					
Nominal by Nominal		Phi	0.382	0.206	0.201				
		Cramer's V	0.270	0.206	0.201				
N of Valid Cases		75							

**Figure 6: Inferential statistics on hypothesis 2**

**Table 5: Cross tabulation on hypothesis 2**

Cross-tabulation variables	Pearson-chi-square test statistics	Fisher or FFH test (if applicable)	Significance (p-value)	Result
Question 4 and Question 6		0.248	0,270	Do not reject the hypothesis at the 5% or 10% level of significance

The results indicated that, as the significance value was above 0.05, no significant association exists between the answer given by respondents to Question 4 and their perception of artificial intelligence. This means that AI has no impact on the participants' tax compliance. A similar pattern was observed across all groups. Whether the respondents answered "yes, unsure or no" to Question 4, the majority of them (above 70% across all three categories) agreed that artificial intelligence could assist in the

collection and payment of taxes. The strength of the association (0.270), as measured by Cramer V, is indicative of a large negligible effect as the degrees of freedom is  $8 ((3-1) * (5-1))$ .

**3.4.3 Hypothesis 32: There is an association between respondents who make use of online payment methods offered by revenue authorities and their perception on whether artificial intelligence could assist in the collection and payment of tax.**

The precondition requesting the respondent to answer Question 5 if they answered yes to Question 4, appeared to have been ignored by the respondents. (Some respondents who answered no or unsure in Question 4, answered yes to Question 5).

The following questions tested this hypothesis:

Question 5: If you answered yes to Question 4, does your organisation make use of online payment methods offered by the revenue authority?

Question 6: Artificial intelligence could assist in the collection and payment of tax.

S2Q5 * S2Q6 Crosstabulation								
			S2Q6					
			Agree	Disagree	Neutral	Strongly agree	Strongly disagree	Total
S2Q5	No	Count	2	0	0	2	1	5
		% within S2Q5	40.0%	0.0%	0.0%	40.0%	20.0%	100.0%
		% within S2Q6	5.9%	0.0%	0.0%	7.4%	14.3%	6.7%
	Unsure	Count	7	0	2	2	1	12
		% within S2Q5	58.3%	0.0%	16.7%	16.7%	8.3%	100.0%
		% within S2Q6	20.6%	0.0%	40.0%	7.4%	14.3%	16.0%
	Yes	Count	25	2	3	23	5	58
		% within S2Q5	43.1%	3.4%	5.2%	39.7%	8.6%	100.0%
		% within S2Q6	73.5%	100.0%	60.0%	85.2%	71.4%	77.3%
Total	Count	34	2	5	27	7	75	
	% within S2Q5	45.3%	2.7%	6.7%	36.0%	9.3%	100.0%	
	% within S2Q6	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	
Pearson Chi-Square	5.593 <sup>a</sup>	8	0.693	0.659	
Likelihood Ratio	5.971	8	0.651	0.733	
Fisher-Freeman-Halton Exact Test	6.373			0.554	
N of Valid Cases	75				

a. 11 cells (73.3%) have expected count less than 5. The minimum expected count is .13.

Symmetric Measures					
	Value	Approximate Significance	Exact Significance		
Nominal by Nominal	Phi	0.273	0.693	0.659	
	Cramer's V	0.193	0.693	0.659	
N of Valid Cases		75			

**Figure 7: Inferential statistics on hypothesis 3**

**Table 6: Cross tabulation on hypothesis 3**

Cross-tabulation variables	Pearson-chi-square test statistics	Fisher or FFH test (if applicable)	Significance (p-value)	Result
Question 5 and Question 6		0.554	0,193	Reject the hypothesis at the 5% or 10% level of significance

The results indicated that no significant association exists between respondents who make use of online payment methods offered by revenue authorities and their perception on whether artificial intelligence could assist in the collection and payment of tax. A similar pattern was observed across all groups. Whether the respondents answered “yes, unsure or no” to Question 4, the majority of them (above 70% across all three categories) agreed that artificial intelligence could assist in the collection and payment of taxes. The strength

of the association (0.193), as measured by Cramer V, is indicative of a very moderate negligible effect as the degrees of freedom is 8  $((3-1) * (5-1))$ .

**3.4.4 Hypothesis 4: There is an association between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online methods to file returns.**

The precondition requesting the respondent to answer Question 4 if they answered yes to Question 2, appeared to have been ignored by the respondents. (Some respondents who answered no or unsure in Question 2, answered yes to Question 4).

The following questions tested this hypothesis:

Section 1(d): Do you have tax knowledge in a jurisdiction other than South Africa?

Question 4: If you answered yes to Question 2, asking whether your organisation submits returns in any country other than South Africa, is the return submitted on an online platform?



DoyouhavetaxknowledgeinajurisdictionotherthanSouthAfricaPleaseti * S2Q4					
Crosstab					
		S2Q4			Total
		No	Unsure	Yes	
Doyouhavetaxknowledgeinajuri sdctionotherthanSouthAfricaPl easeti	Count	4	10	21	35
	% within Doyouhavetaxknowledgeinajurisdict ionotherthanSouthAfricaPleaseti	11.4%	28.6%	60.0%	100.0%
	% within S2Q4	57.1%	66.7%	37.5%	44.9%
Yes	Count	3	5	35	43
	% within Doyouhavetaxknowledgeinajurisdict ionotherthanSouthAfricaPleaseti	7.0%	11.6%	81.4%	100.0%
	% within S2Q4	42.9%	33.3%	62.5%	55.1%
Total	Count	7	15	56	78
	% within Doyouhavetaxknowledgeinajurisdict ionotherthanSouthAfricaPleaseti	9.0%	19.2%	71.8%	100.0%
	% within S2Q4	100.0%	100.0%	100.0%	100.0%
Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	
Pearson Chi-Square	4.537 <sup>a</sup>	2	0.103	0.117	
Likelihood Ratio	4.558	2	0.102	0.117	
Fisher-Freeman-Halton Exact Test	4.502			0.109	
N of Valid Cases	78				
a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 3,14.					
Symmetric Measures					
		Value	Approximate Significance	Exact Significance	
Nominal by Nominal	Phi	0.241	0.103	0.117	
	Cramer's V	0.241	0.103	0.117	
N of Valid Cases		78			

**Figure 8 Inferential statistics on hypothesis 4**

**Table 7: Cross tabulation on hypothesis 4**

Cross-tabulation variables	Pearson-chi-square test statistics	Fisher or FFH test (if applicable)	Significance (p-value)	Result
Section 1(d) and Question 4		0.109	0,241	Reject the hypothesis at the 5% or 10% level of significance

The significance value of 0.109 of the FFH test indicates that there is no association between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online methods to file returns. Observation of the results show that, of the respondents that selected yes to having tax knowledge in a jurisdiction other than South Africa, only 81.4% make use of online filing methods. This makes up 62.5% of the respondents who use online filing methods. Of the respondents that answered no to having tax knowledge in a jurisdiction other than South Africa, 60% make use of online filling methods. This group makes up 37.5% of the respondents who use online filing methods. The strength of the association ( $0.241$ ), as measured by Cramer V, is indicative of a medium negligible effect as the degrees of freedom is 2  $((3-1) * (2-1))$ .

**3.4.5 Hypothesis 5: There is an association between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online payment methods offered by revenue authorities.**

The precondition requesting the respondent to answer Question 5 if they answered yes to Question 4, appeared to have been ignored by the respondents. (Some respondents who answered no or unsure in Question 4, answered yes to Question 5).

The following questions tested this hypothesis

Section 1(d): Do you have tax knowledge in a jurisdiction other than South Africa?

Question 5: If you answered yes to Question 4, does your organisation make use of online payment methods offered by the revenue authority?

DoyouhavetaxknowledgeinajurisdictionotherthanSouthAfricaPleaseti * S2Q5					
Crosstab					
		S2Q5			Total
		No	Unsure	Yes	
DoyouhavetaxknowledgeinajurisdictionotherthanSouthAfricaPleaseti	Count	3	9	23	35
	% within DoyouhavetaxknowledgeinajurisdictionotherthanSouthAfricaPleaseti	8.6%	25.7%	65.7%	100.0%
	% within S2Q5	60.0%	75.0%	37.7%	44.9%
Yes	Count	2	3	38	43
	% within DoyouhavetaxknowledgeinajurisdictionotherthanSouthAfricaPleaseti	4.7%	7.0%	88.4%	100.0%
	% within S2Q5	100.0%	100.0%	100.0%	100.0%
Total	Count	5	12	61	78
	% within DoyouhavetaxknowledgeinajurisdictionotherthanSouthAfricaPleaseti	6.4%	15.4%	78.2%	100.0%
	% within S2Q5	100.0%	100.0%	100.0%	100.0%
Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	
Pearson Chi-Square	6.133 <sup>a</sup>	2	0.047	0.047	
Likelihood Ratio	6.246	2	0.044	0.083	
Fisher-Freeman-Halton Exact Test	6.053			0.047	
N of Valid Cases	78				
a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 2,24.					
Symmetric Measures					
	Value	Approximate Significance	Exact Significance		
Nominal by Nominal	Phi	0.280	0.047		
	Cramer's V	0.280	0.047		
N of Valid Cases	78				

**Figure 9: Inferential statistics on hypothesis 5**

**Table 8: Cross tabulation on hypothesis 5**

Cross-tabulation variables	Pearson-chi-square test statistics	Fisher or FFH test (if applicable)	Significance (p-value)	Result
Section 1(d) and Question 5		0.047	0,280	Do not reject the hypothesis at the 5% level of significance

The results indicated that, as the significance value was below 0.05, a statistically significant association exists between respondents who have tax knowledge in a

jurisdiction other than South Africa and the use of online payment methods offered by revenue authorities. A similar pattern was observed for both groups as, of the respondents that selected yes to having tax knowledge in jurisdictions other than South Africa, 88.4% make use of online payment methods and 11.6% said no or unsure. Of the respondents that selected no to having tax knowledge in jurisdictions other than South Africa, 65.7% make use of online payment methods and 34.3% said no or were unsure. The strength of the association (0.280), as measured by Cramer V, is indicative of an above medium, negligible effect, as the degrees of freedom is 2  $((3-1) * (2-1))$ .

### **3.5 CONCLUSION**

The study aimed to analyse the impact which artificial intelligence may have on the collection of taxes. The study formed part of a bigger study that aimed to analyse the impact which artificial intelligence may have on tax administration. Several findings arose from the data collection in line with the objective of the study.

The use of e-filing has a positive impact on use of online methods to pay taxes. Participants who use online filing methods do not necessarily agree that artificial intelligence could assist in the collection and payment of taxes, therefore confirming the perceived usefulness theory of technology acceptance. There is an association between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online payment methods offered by revenue authorities. This could mean that other countries' use of online payment methods has a positive impact on their tax collection. The survey did not ask the participants which other jurisdictions they have tax knowledge in, therefore the researcher is unable to specify upon which countries this finding impacts.

The above findings show that just like any form of technology, artificial intelligence has its benefits and limitations. The attitude or perception taxpayers have towards artificial intelligence determines their reliance thereon.

## **CHAPTER 4: CONCLUSION**

### **4.1 INTRODUCTION**

The empirical study aimed to understand the impact which artificial intelligence has on the collection of taxes. The previous chapters of this research included the literature review, the data analysis, together with the techniques used to analyse the data. The purpose of this chapter is to summarise the findings, discuss the limitations of the study and highlight the conclusion.

### **4.2 SUMMARY OF FINDINGS AND CONCLUSION**

The main objective of this study was to analyse the impact which artificial intelligence has on tax collection. To achieve this objective the researcher analysed qualitative and quantitative data.

Chapter 1 of the study provided the background or rationale of the research topic. The research problem, the research question and the objective pertaining to the topic were clearly articulated. Artificial intelligence, digitalisation, tax administration and tax evasion were identified as constructs and explained.

Chapter 2 contained the qualitative data used in the literature review. Tax compliance was identified as the cornerstone of tax collection. Previous studies highlighted that AI technology has a positive impact on tax compliance, which results in increased tax collection. Literature also identified that the success of AI adoption within tax administration is dependent on how taxpayers accept it. The researcher cited the theory of technology acceptance as a measure for how taxpayers relate to AI technology. In this chapter the hypotheses developed from the analysis of the literature and the questions used in the survey emerged. These hypotheses were analysed in the data analysis chapter.

Chapter 3, which is the data analysis chapter of the study, analysed quantitative data. To obtain quantitative data, the researcher conducted a survey which was targeted at tax professionals to obtain their perception and acceptance of AI technology within the tax system. The researcher relied on the use of the statistical analysis tool SPSS, to analyse the data. Approved statistical methods were used in the analysis of the data.

The survey was answered by 97 participants. Seventeen of the responses were disqualified, as they were not tax professionals as required. Descriptive statistics are used to describe and summarise the characteristics of data collected from a survey. Furthermore, the researcher used inferential statistics techniques to test the relationship between data to test hypotheses or make conclusions based on statistical evidence.

The inferential analysis indicated the following conclusions:

- There is an association between filing returns online and the use of online payment methods offered by revenue authorities.
- There is no association between respondents who file returns online and their agreement to the statement “artificial intelligence could assist in the collection and payment of tax”.
- No significant association exists between respondents who make use of online payment methods offered by revenue authorities and their perception on whether artificial intelligence could assist in the collection and payment of tax.
- An association exists between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online methods to file returns.
- A statistically significant association exists between respondents who have tax knowledge in a jurisdiction other than South Africa and the use of online payment methods offered by revenue authorities.

### **4.3 LIMITATIONS**

The sample of the research was only limited to tax professionals, which had a positive element as it meant that participants were familiar with tax issues and concepts referred to in the survey. However, this limited the sample size of the data which may be seen to have an impact on the final findings. The study was broadly based, and the researcher did not limit the study to a specific jurisdiction.

### **4.4 FUTURE RESEARCH**

The application of AI in the field of taxation impacts the premise of tax compliance. AI technology has enhanced the work of tax authorities and enhances taxpayers' trust in the tax system (Li & Zhong, 2021). This improves on tax compliance by reducing tax evasion which results in increased tax collection. Tax compliance is quite a broad subject, so future studies may focus on the impact of artificial intelligence on tax compliance. Future studies could be conducted on a similar topic without limiting or choosing a different sample or population from which to collect data. This study could also be conducted as a comparative study on how different tax jurisdictions have applied AI technology within their tax systems and how it has impacted tax collection.

### **4.5 FINAL REMARKS**

From the research it is evident that artificial intelligence does have an impact on tax compliance. Participants who use online filing methods do not necessarily agree that artificial intelligence could assist in the collection and payment of taxes. This confirms the perceived usefulness theory of technology acceptance. It is evident that humans still have their reservations with regard to artificial intelligence.

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# APPENDICES

## APPENDIX A: QUESTIONNAIRE



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Economic and Management Sciences

### Letter of Introduction and Informed Consent

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### The impact of artificial intelligence on tax

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Dear Participant

You are invited to participate in an academic research study conducted by Eza Hlomendlini, Solange Mvudi Nsimba and Oratile Moripe, Masters students from the Department of Taxation at the University of Pretoria.

The purpose of the study is to evaluate the understanding that taxpayers have towards the use of artificial intelligence, technology, or data analytics in the tax administration

process. Furthermore, the questionnaire aims to analyse how these applications can or will make the tax administration process easier or better.

Please note the following:

- This is an anonymous survey as your name will not appear on the questionnaire. The answers you give will be treated as strictly confidential as you cannot be identified in person based on the answers you give.
- Your participation in this study is very important to us. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences.
- Please answer the questions in the attached questionnaire as completely and honestly as possible. This should not take more than 10 minutes of your time.
- The results of the study will be used for academic purposes only and may be published in an academic journal. The researchers will provide you with a summary of our findings on request.
- Please contact our study leader, Mr L.L. Motsamai, 012 420 2750 or e-mail: [Lungelo.Motsamai@up.ac.za](mailto:Lungelo.Motsamai@up.ac.za), if you have any questions or comments regarding the study.

**SECTION 1: Demographics**

a. Are you willing to participate in this questionnaire?

Yes		No	
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b. Sector operating in *(please tick relevant answer)*

Financial services	
Manufacturing	
Communication and Information Technology	
Mining	
Construction	
Transportation and Logistics	
Other (Please specify)	

c. Are you a tax professional employed in a medium to large company or business owner with tax knowledge? (Please tick the applicable option)

*(If participant answers neither to the below question, survey will end)*

Tax professional		Business owner with tax knowledge		Neither	
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d. Do you have tax knowledge in a jurisdiction other than South Africa?  
*(Please tick relevant answer)*

Yes		No	
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Fairly divided

## SECTION 2: Questions

Technology has transformed our societies and our daily lives. It can certainly be said that it has improved the way we live and how businesses are run around the world. The use of artificial intelligence, as a form of technology, has many possibilities that could benefit the tax function. One of these possibilities is that artificial intelligence can process volumes of transactions within seconds. Thus, giving tax professionals sufficient time to focus on value-adding activities.

		Yes	No	Unsure
1	Does your employer or organisation use e-filing to submit returns?			
2	Does your organisation file or submit taxes in any other country besides South Africa?			
3	If yes to (2) above, is this done manually?			
4	If yes to (2) above, is this done on an online platform?			
5	If yes to (4) above, does your organisation make			

	use of online payment methods offered by the revenue authority?			
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Tax revenue authorities are investing significantly in resources in the development of e-services and digital solutions. They are taking advantage of the fast-tracking digital transformation to improve their services, reduce burdens on taxpayers and improve tax compliance. In doing so they are also able to reduce or limit the occurrence of tax evasion.

Please indicate how much you agree with the following statements:

		<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Neither agree nor disagree</b>	<b>Somewhat Disagree</b>	<b>Strongly disagree</b>
6	Artificial intelligence could assist in the collection and payment on tax.					
7	The use of technologies would assist in reducing errors in submissions and payments of taxes.					
8	The use of technology will assist in curbing Tax evasion.					
9	Understating income in order					

	to pay less taxes is wrong.					
10	Tax evasion is ethical if the tax system is unfair.					
11	Penalties imposed by revenue authorities encourage the organisation to pay taxes.					

Tax authorities are responding to the pressure for the tax transparency required by governments basing their efficiency on data gathering programs that enable matching and sharing of taxpayers' information. Data analytics is used to improve tax collections and encourage compliance from taxpayers. To that effect, organisations make use of data analytics in tax software systems to ensure compliance with relevant tax authorities.

		Yes	No	Unsure
12	Does your organisation make use of the available tax software systems (Thomson Reuter OneSource/CaseWare Cloud/TaxPacc)?			
13	If yes to (12) above, has the use of tax software systems assisted in time saving?			



14	If yes to (12) above, has the tax software system assisted in improving tax compliance?			
15	If no to (12) above, would you consider using tax software systems?			
16	Do you think tax software systems are beneficial in achieving tax efficiency/compliance?			

**SECTION 3: Comments**

17. How does your organisation prefer to deal with tax queries (online, in person at the tax branch or otherwise)? Please elaborate.

18. Do you have any comments regarding the benefits or disadvantages of artificial intelligence and automated processes on tax administration and tax compliance? Please elaborate.