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An Investigation into the Changing Workplace of South African Auditors and their Experiences of Artificial Intelligence (AI) Systems and the Implications for the Auditing Profession

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DECLARATION

I declare that the dissertation, which I hereby submit for the degree at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution. Indeed, any necessary efforts have been made in order to acknowledge and reference all secondary material used in this dissertation.

Signature: 

December 2023

ABSTRACT

The ongoing technological development and advancements have led to changes to the audit profession in South Africa and an alteration of the audit professionals' work life. This dissertation investigates the impact this change has had and may still have on the auditor. The focus is mainly on the auditor's work life and work experiences in the face of this digital transformation, considering the impact that Artificial Intelligence (AI) systems, such as audit tools and audit software packages, have on the auditors' way of work and their workflow. The investigation adopted the concept of individual unlearning to better understand how exactly this impacted the auditor, allowing for insight into behaviour and attitude, enabling the auditor to interact and work well with the new Information Technology (IT) audit tools introduced/integrated into their work processes. This dissertation adopts the qualitative thematic analysis (TA), investigating the auditor, their thoughts, and perceptions on their experiences with IT audit tools used in the audit process, the impact that these IT audit tools have, and the support that the auditors receive from their designated workplace rather than solely focusing on the technology and the benefits it yields for the company. This approach ensured an understanding of the auditors' preconceived outlooks on AI versus what they have experienced while incorporating them into their work processes. This allowed for further insight into the implications of integrating IT audit tools on the auditor's role. Twenty in-depth semi-structured interviews were conducted with South African auditors from different audit companies. The chosen participants were placed into two cohorts; each had a key informant, allowing for the recruiting of other participants. It was found that the use of IT audit tools in audit has a direct influence on the manner in which the auditor experiences their work. Furthermore, the findings indicate that the role of the auditor is changing, thus implying changes in the profession, too. There should be continuous learning initiatives and adaptive strategies within South African audit firms. This dissertation contributes to the existing literature on the impact of digitalisation on the South African audit profession and its stakeholders.

Keywords: Audit Process; Auditor; Automation; Digitalisation; Work Life; Upskilling

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LIST OF ACRONYMS

AI	Artificial Intelligence
AICPA	American Institute of Certified Public Accountants
ADP	Audit Development Programme
APC	Assessment of Professional Competence
BCompt	Bachelor of Accounting Science
BRA	Business Risk Audit
COVID-19	Coronavirus Disease 2019
CPA	Certified Public Accountant
CPD	Continuing Professional Development
GAAS	Generally Accepted Auditing Standards
IAASB	International Auditing and Assurance Standards
ICAEW	Institute of Chartered Accountants in England and Wales
IRBA	Independent Regulatory Board for Auditors
IT	Information Technology
ITC	Initial Test of Competence
ISA	International Standards on Auditing
IFAC	International Federation of Accountants
NDA	Non-Disclosure Agreement
RA	Registered Auditor
SADAG	South African Depression and Anxiety Group
SAICA	South African Institute of Chartered Accountants

Contents

CHAPTER ONE – INTRODUCTION

Background to the Study

Artificial intelligence (AI), particularly systems such as audit software packages and Information Technology (IT) audit tools, plays a fundamental role in the everyday function of the audit profession in South Africa. The way AI influences and impacts the South African auditor and how they experience their work can be both negative and positive, which is what this dissertation aims to capture. Although it can be argued that the audit software packages and tools used in the South African audit space do more good than bad in terms of the benefits they provide the auditor during their work processes, we must not neglect the negative aspects that may come with their use. Thus, it is essential to consider the auditor's experience in relation to introducing and integrating these digital technologies into their work. It is essential to consider the effects of these IT audit tools on the auditor to understand the auditor's experience and its impact on the audit profession.

As Pettersen (2018:1) describes, AI is characterised by computer systems that require human intervention through "visual perception, speech recognition decision making or translation." Through the use of algorithms, simply put, AI can be described as the advanced development of computer systems that have the ability to make decisions that are said to be ahead in development and observe its social environment, with the specific purpose of minimising risk in order to accomplish the objective of a particular task (Guang-huan, cited in Albawwat and Frijat, 2021:755). Currently, the concept of AI comes in the form of sophisticated technology (new and updated computer software and hardware) that are seen to aid in keeping up with the globalisation, automation, and digitalisation of the business world; however, what implications might this have for the South African audit profession and the audit professional? Can this be viewed as something that has a positive or negative connotation for the South African auditors' work life? This is what this Masters dissertation aims to establish.

The audit profession is no stranger to this occurrence, boasting an increase in the automation and digitisation of the audit processes (Albawwat and AI Frijat, 2021). This

is owed to the increasingly fast-paced and competitive business environment that has come with and has been created by globalisation. Globalisation, in its nature, requires that businesses develop an international interface, which can cause many business firms to try and keep up with this notion (Albawwat and AI Frijat, 2021).

The introduction and integration of IT audit tools have vastly improved auditors' work and drastically transformed the audit process (Alles and Gray, 2020). However, there seems to be a concern about AI replacing the auditor soon (Alles and Gray, 2020). Frey and Osborne, cited in Alles and Gray, 2020) hypothesise a 94% probability that this may be a reality that the audit profession will face. Concerned that tech companies, i.e., Google, could interfere with and disrupt the audit profession, it comes as no surprise that audit firms have taken the initiative to invest in "cutting-edge technological innovations to enhance the audit process's efficiency and effectiveness" (Alles and Gray, cited in Albawwat and Frijat, 2021:755).

The Problem Statement

This dissertation focuses on the audit profession in South Africa, particularly the impact of AI on the profession and the implication that this has on the auditor's role. It explores the auditors' work life and focuses on their work experiences in relation to the use of AI systems such as audit software packages and IT audit tools. This dissertation looks beyond the surface to understand the relationship that the auditor has with the AI systems utilised within their profession and the implications that this may have on the audit profession as a whole, digging deeper in its quest to understand the participation of auditors in the digitalisation and automation of the audit profession. It is important to note that for the purpose of this dissertation, the reference to 'AI systems' refers to IT audit tools and audit software packages.

As a profession, the field of auditing is known to be highly regulated. Responsible for this regulation is the Independent Regulatory Board for Auditors (IRBA) and the registration of all Registered Auditors (RAs) in South Africa to ensure that all auditors comply with the Auditing Profession Act of 2021 according to IRBA and the International Federation of Accountants (IFAC) on a global spectrum. The IRBA is responsible for ensuring that:

(1) improper conduct by RAs is investigated; (2) develop an "investigative and disciplinary system for RAs; (3) conduct quality assurance reviews;" (4) ensure that auditing standards are set; (5) the maintenance of a registry of RAs; (6) "set additional initial professional development requirements to become a RA;" and (7) ensure that procedure is followed to ensure the public is out of harm's way in their dealings with RAs (IFAC, 2020:1). The code of ethics for professional auditors under the IRBA states that RAs must follow ethical considerations and requirements set in accordance with the Auditing Profession Act of 2021.

The legislation mentioned above, under which South African auditors are expected to adhere, is the milieu within which AI has been introduced into the audit profession. Auditors must question whether any 'new' way of doing their work would contravene their professional regulations and ethics. Therefore, apart from the need to understand how AI might have changed the way auditors do their job, it is also essential to know whether the IT audit tools comply with the ethics and regulations mentioned above. Ahmed (2020:1) asserts in the Information Systems Audit and Control Association (ISACA) that auditors must prioritise *two* (own emphasis) primary aspects when performing an audit using AI systems (i.e., audit software packages and IT audit tools). Firstly, compliance assesses the risks related to "the rights and freedoms of data subjects" (Ahmed, 2020:1).

Furthermore, the auditor must be aware of any risks incurred when working with sensitive data that needs to be audited for clients (Ahmed, 2020). Secondly, technology considers risks related to "machine learning, data science and cyber security" (Ahmed, 2020:1). This suggests that working with technology comes with its pros and cons; as such, auditors are expected to be aware of the necessary precautions that should be taken to ensure the safety and protection of the data they work with. Auditors and audit companies must develop clear objectives for the audit and consider the risk IT audit tools may pose to the company and the audit profession. Ahmed (2020:1) adds that from a compliance perspective, auditors need to understand the underlying data privacy and data protection principles and the impact of AI applications and initiatives on the rights and freedoms of data subjects and natural persons.

Having a complete understanding of the IT audit tools used would be most effective when it comes to developing policies to ensure that the work done by the auditor is still within the stipulated audit standards. With the importance of the legislation, the ethics and consideration laid out above, it is important to consider the auditor and how they experience their work when a new audit software package or audit tool is introduced or when there is an update on the software or audit tools already in use. Considering the impact this may have on the auditors' workflow is imperative.

The digitisation of the audit process is an ongoing and prevailing process that will continue for centuries. Although this process can be perceived as beneficial to the auditor and the company for which they work, it can also be perceived as a notion that causes or comes with what Cong, Du and Vasarhelyi (2018) referred to as technical disruption. When audit companies introduce these new forms of technology, it benefits the company more than the auditor tasked to work with the newly introduced and integrated AI system/s (Cong *et al.*, 2018). Furthermore, disruptive technology is a new wave of innovation that changes or 'disrupts' how audit companies operate (Cong *et al.*, 2018). This will, in turn, impact those working in the said company. Likewise, auditors are bound to be directly or indirectly impacted by any new technologies added or changes in their day-to-day work, ultimately affecting their work life and how they experience their work (changes in the workplace and workflow) (Cong *et al.*, 2018).

The introduction of new audit software packages and audit tools ultimately creates new opportunities for the auditors to learn and enhance their skills, but it also poses a lot of demands as it requires that the auditor using them have advanced technological skills (Greenman, 2017). The changes are undoubtedly needed and have been a continuous process that is not new to the audit profession (Chen, Huang, Chiu and Pai, 2012). However, these changes are taking place rapidly and quickly, often proving to be drastic (Chen *et al.*, 2012), which is even more reason to consider the impact that this may have on the auditor and how this impacts their work. New technologies (audit software packages and audit tools) can be said to have a significant impact on the "overall structure and processes" (Cong *et* al., 2018) within the audit profession and thus massively transform existing professional occupations and task profiles within a very short time (Neely and Cook, cited in Cong *et al.*, 2018:2-3).

Therefore, as researchers, the ramifications of this change and continuous transformation must be considered in line with how they impact the auditors' work and workplace.

The Purpose of the Dissertation

It is with the above-mentioned in mind that this dissertation explores the auditors' capabilities and whether they are able to align these capabilities "(technical knowledge, skills, values, ethics and attitudes)" to that which is required of them, in a new auditing environment (Barac, Gammie, Howieson and van Staden, 2016:5). Additionally, this dissertation aims to understand how IT audit tools like audit software/audit tools have changed the workplace and work practices for auditors (Ahmed, 2020). Furthermore, the aim is to establish whether the auditors experience any conflict with their professional ethics and regulations, considering that they are no longer expected to do audits manually, but perform an audit digitally (Ahmed, 2020).

Moreover, the goal is to gain more insight into how IT audit tools (audit software packages and audit tools) have changed, influenced, impacted, and shaped the South African audit profession. Lastly, this dissertation asks the question: Can auditors upskill themselves by gaining the necessary skills and knowledge to keep up with this shift and transformation to automation of the audit process? Therefore, I will explore the integration and implementation of IT audit tools in the audit profession by including auditors and their work experiences with audit software packages and audit tools in mind, as well as the implications of their implementation and use on the profession. This dissertation looks into this phenomenon through the eyes of the auditor, moving beyond the surface and digging deeper to get a holistic picture of what the audit profession is like and where it stands today, rather than merely focusing on the IT audit tools alone.

Research Questions

The dissertation asked the following research question:

"How has the introduction of Artificial Intelligence systems changed the audit profession and workplace, and what have been the experiences of South African auditors?

The above question was broken down into the following five sub-questions:

1. What new technologies (audit software packages/audit tools) have been introduced into South African auditing firms, and how have these affected the auditors' work life and experiences?
2. Can these new technologies be deemed useful in ensuring quality auditing, reducing human error, and reducing the auditors' workload?
3. Will auditors be able to upskill themselves with the necessary skills and knowledge needed in order to keep up with this shift and transformation of the audit process?
4. Do auditors believe there is any conflict between the introduction of AI in their workplace and their professional values and ethics?
5. What are the implications of using IT audit tools for the audit profession?

Aims and Objectives of this Dissertation

This dissertation aims to analyse the experience of audit professionals on their use of IT audit tools and their impact on their profession. It sought to understand whether auditors perceive that they have the necessary skill set and knowledge to keep up with the introduction and integration of IT audit tools into their work, as well as whether they could continuously upskill themselves as technology advances. Furthermore, it looks into the concept of unlearning and how this impacts the auditors' perception of the newly introduced AI systems.

The primary objectives of this dissertation are to:

- Examine the usefulness of the audit software packages/audit tools to the auditor and the auditors' ease of use.
- Explore the implications of audit software packages, how they shape the South African audit profession, and what this could imply for the profession.
- Investigate whether South African auditors can keep up with the technological advancements of the audit software packages and the auditors' view on this.
- Assess and know the risks and benefits of introducing and using AI systems in the audit profession through the eyes of the auditor.
- Gain insight into what the role of the auditor has become for the auditor and what it might look like in the future.

The Rationale of the Dissertation

Ilias, Ghani and Azhar (2017) state that although studies have been conducted on the impact of AI (i.e., IT audit tools such as audit software and audit tools), the findings are broad. In the context of South Africa, there are inadequate studies on the impact of AI on the auditor and the profession that are South African-based, making it challenging to generalise some of the conclusions of these studies to South Africa. Additionally, there is a focus on the IT audit tools and their risks and benefits to the audit profession without considering the auditors' work life and experiences concerning their use of newly introduced or updated audit software packages and audit tools. Ilias *et al.,* (2017) further elaborate that research has been conducted on the perceptions of auditors on the audit software packages and audit tools that are used in Certified Public Accountant (CPA) firms; these would be firms like Deloitte and KPMG in the context of South Africa. However, there is a focus on the adoption of specific kinds of audit software (general audit software), what these software packages can do for the auditor, and what these software packages can do in terms of analysing and mining specific data (Ilias *et al.*,2017). Moreover, these audit software packages impact business decision-making, regulatory compliance, continuous reporting, financial reports availability, analysis, and lastly, continuous auditing (Jaber and Abu Wadi, 2018:365).

These include the benefits and difficulties auditors might encounter during the audit process (Jaber and Abu Wadi, 2018). Therefore, with the above in mind, emphasis is placed on the auditor, their work life, and their work experiences to understand their perspective on the digitisation and automating of the audit process.

This dissertation also moves the auditor from being a passive entity to an active one by giving the auditor a voice and getting their insight and perception on IT audit tools, such as audit software packages and tools in their designated places of work. In doing so, capturing the narrative of the auditor, their experiences, thoughts and ideas on the automation of the audit process and the auditors' perspective on what the future of auditing might look like given the nature of technology today and the fact that it keeps advancing. Furthermore, it captures the subjectivity of a phenomenon that would be somewhat robotic.

Considering this and the lacunae in the existing literature, this dissertation focuses on the auditors' experiences with IT audit tools used in their designated company and their implications on the auditor's work. Moreover, this research study adds to a scientific body of knowledge in the Social Sciences on new technologies and how they are changing and shaping the workplace and multiple professions. Furthermore, this dissertation seeks to generate rich and in-depth information that can be used for further research as well as for the entities mentioned above (Social Sciences). In addition, it seeks to bring about a better understanding of the South African audit profession today. This includes the ideas, thoughts, and perceptions of the auditor in this regard. Lastly, it seeks to bring insight into what awaits auditors and those yet to join the profession in a more professional capacity in the future. Thus, the above contributes to the main argument of this dissertation.

Argument of the Dissertation

This dissertation argues that the introduction, integration, and implementation of new audit software packages or tools and the upgraded versions of the already-used AI systems have fundamentally changed the audit workplace over the last decade. Additionally, through the analysis of the data collected, it is of no question that the digitalisation and automation of the audit process and the digital infrastructure of the audit profession have

impacted how South African auditors experience their work and will continue to do so in the long run.

To make this argument, this dissertation asks, *How has the introduction of Artificial Intelligence systems changed the audit profession and workplace, and what have been the experiences of South African auditors?* To answer this question, four empirical chapters were employed utilising the following topics under which this question will be further discussed: The South African audit profession, the audit process, ensuring audit quality and the implications on the auditors' work life, the future of auditing and skills development, and the conclusion. These chapters demonstrate how the South African audit profession has been changed and influenced by the introduction and use of IT audit tools (audit software packages and tools) and the impact and implications on the auditors' work role.

The analysis of the data collected for this study indicated that there has been a change in how auditors perform their audit duties. It appears that the way audits were performed in the past five years and even before is different from how they are done currently, although some performance methods remain. This is strongly connected to understanding the client's needs. Moreover, this shows how the auditor perceives and understands the AI system, which is crucial. This ensures that the auditor can easily use the audit software/audit tool without any hindrances that could get in the way of doing and completing the audit effectively and with the utmost efficiency.

Additionally, to avoid the auditors' lack of understanding, which could also affect the degree to which they interact with the software/audit tools, the introduction of more digital infrastructure and a digitalised way of doing things ensures two things, among others: it benefits the audit company and improves how the auditor performs the audit/does their work (Teo, 2011). As such, the audit company needs to take into account the auditors' individual and collective experiences of these changes and try to avoid succumbing or possibly getting overwhelmed by the competitive nature of the audit profession as a whole; in turn, introducing software that may stress the auditor and in some instances make their work life more difficult. This not only affects the company by creating a passivity on the auditor's end towards the new audit software and tools, but stunts the auditor's growth in this new technology, thus affecting the shift towards

digitalisation of the overall profession. This pressures auditors to use audit software and tools they have not gotten adequate training for and limits the amount of technological advancement that could occur in the future. Furthermore, something of this nature will affect the auditors' perceptions of the IT audit tools introduced, impacting their work lives.

It can be argued that the concept of unlearning, as afore mentioned in the dissertation, can be implemented to try and change this. The data analysis for this paper indicated the following: the research participants in both Cohorts A and B perceived a positive reception to the IT audit tools introduced and used within their designated workplaces and that the process of individual unlearning, coupled with the willingness to work with the newly introduced software and keeping an open mind, yields positive results in terms of work life and their experience of the software. Although clearly stating that the audit software package and audit tools do not entirely reduce their workload, they noted that it makes them work faster with a lesser chance of human error. Furthermore, having formal and informal support through effective leadership, supervising, and training, some research participants stated that it had improved their understanding and use of IT audit tools. This kind of support seemed to help create a more positive outlook towards the IT audit tools they utilise currently and the ones that will possibly be introduced in the not-so-distant future.

As such, it can be assumed that to make the relationship between the auditor and the audit software and tools with which they interact cohesive, company support and the leadership within that company must be strengthened. It is evident from participant responses that this is the case; they receive the help they need to perform optimally. Although some admit that the workload is still a lot, they also acknowledge that the audit software has made it much easier and faster to work while ensuring the client's needs are met.

The Structure of the Dissertation

This dissertation is divided into six chapters:

Chapter two of this dissertation illustrates the review of South African literature on IT audit tools, their implementation, and their use in the audit profession in South Africa.

This includes the implications of this digital transformation on the audit profession, particularly on the auditor. In this chapter, the dissertation draws from multiple scholarly articles to demonstrate the extent to which the transformation to the digitalisation and automation of the audit process has gone into South Africa. The themes identified and discussed in this chapter are the digitalisation of the audit profession and IT audit tools, the audit process and ensuring audit quality, AI and the future of the audit profession, and the training and upskilling of auditors. Here, the chapter also considers the concept of unlearning to showcase and illustrate the emergence of a new way of thinking within the audit profession to keep up with digitalisation and automation. Furthermore, the chapter looks into the auditor's consideration in all processes involving IT audit tools, like the audit software packages and audit tools, through the company's support. By identifying lacunae, this dissertation places emphasis on the importance of training and upskilling to ensure success in completing the audit rather than only considering the computer technology used.

The research methodology is the third chapter of this dissertation. Chapter three discusses the research methodology adopted to conduct the research study for this dissertation. The chapter commences with the research design (qualitative thematic analysis [TA]), which outlines how the analysis of the subject matter of this research study will be investigated. The research design details the approach to which the research study will be conducted and outlines the details. Next, the study setting details the medium used to facilitate the interviews with the selected research participants. The eligibility criteria that the research participants had to meet in order to be eligible to qualify as a participant were discussed, followed by sampling – the methods of selecting eligible research participants for the study. Data collection and data analysis were discussed in detail within this chapter, detailing the data collection instruments and the methods used to analyse the data collected. The chapter concludes by discussing the ethical considerations followed when conducting the research study and the limitations/challenges experienced while the research study was being carried out. It ends with a conclusion to the chapter.

Next are the empirical chapters, which encompass the information obtained after the data collected were analysed to contribute to the main argument of this dissertation. The first of these chapters is chapter four, titled The South African audit profession. This chapter discusses the audit profession in South Africa and the impact that IT audit tools like audit

software and tools have had on it and its stakeholders. The chapter situates the 'professions' within a conceptual framework, discussing this with reference to the relevant legislation and regulatory frameworks the South African audit profession follows. Furthermore, I discuss the technologies introduced into the profession and their impact on the profession. To make this discussion, four areas were utilised: understanding professions, the South African audit profession, the new technologies that have been introduced/updated and upgraded, and how these new technologies have disrupted, influenced and shaped the South African audit profession. In its quest, chapter four answers the sub-question, "What new technologies (audit software packages) have been introduced into South African audit firms, and how have these affected the audit profession? The chapter addresses this question, giving evidence from secondary data proving that the introduction of new technologies impacts the South African audit profession.

Chapter five investigates the factors that influence the South African audit professional's work life and how they experience their work, highlighting all the factors that impact their work in a beneficial or non-beneficial way. Here, I capture the auditors' thoughts and perceptions of what the IT audit tools they work with do or do not do for them. I also investigate the technological learning curve experienced by the auditors when a new software or audit tool is introduced and integrated into the auditors' work, addressing the skills gap that may be present in this context as well. In this chapter, I argue that the auditor should have the necessary skills and knowledge to work with the IT audit tools introduced and integrated into their work processes. This will ensure a bridge in the skills gap concerning the technological learning curve. I also argue that the auditors' ability to gain more knowledge and skills regarding the newly introduced audit software will aid in them staying relevant within their profession. This argument is captured through the following themes: factors influencing audit quality, the impact of technology on audit quality, the impact of technology on the auditors' workload, the technological learning curve, the auditors' perceptions of the IT audit tools, and the conclusion of the chapter.

Following this argument is chapter six. This chapter is titled, The Future of Auditing and Skills Development. Here, the thoughts of the auditors are captured in what direction they think the South African audit profession is going. Chapter six argues that employee participation is integral to the success of the digital transformation of the South African

audit profession. It is important that employees are considered when any change is introduced within an organisation; thus, this applies to a digital transformation, too. Emphasis was placed on the auditors' thoughts, views, and perspectives on the South African audit profession and what they thought was necessary for the auditor to stay relevant and flourish within the profession. I looked into skills development in light of the afore mentioned to get insight into what the auditors think can be done to ensure that those in the profession and those yet to join are equipped with the skills and knowledge they need to work at their optimum best.

The last to complete the empirical chapters is chapter seven. This chapter sums up the argument of this dissertation, arguing that the introduction, integration, and use of IT audit tools into the audit profession and the auditors' work play a role in influencing and shaping the profession. Furthermore, the auditors' role is also impacted by this digital transformation, and the technological developments and advancements will continue to impact them.

CHAPTER TWO – THE LITERATURE REVIEW

Introduction

Introducing AI systems, such as audit software packages and tools, has gradually changed and, in some ways, transformed the audit profession as we know it (Holmes and Lyngsten, 2020). This has compelled the profession to keep up with these technological advancements to ensure that the audit firm stays ahead of its competitors (AICPA, 2020). This impacts the firm and has implications for the audit professional. Therefore, the auditors' experiences of the digitalisation of the audit profession must be captured to bring insight into the challenges and benefits of the digitalisation and automation of the audit for both the profession and its professionals. This transition to the digitalisation and automation of the audit profession has highlighted the importance of educating audit professionals about the many computer technologies and AI systems being introduced and those they are tasked to work with on a day-to-day basis (Holmes and Lyngsten, 2020).

This section of the dissertation evaluates the literature on the introduction and use of AI systems (i.e., audit software packages and IT audit tools) in the audit profession, shedding light on the impact this has on the auditor and the implications this has on the auditors' role. With the audit profession advancing in the direction of automation, there is added pressure for auditors and those yet to join the industry to possess a significant level of knowledge, if not the basic level of knowledge, of the newly introduced AI systems and Information Technology (IT) in particular (Holmes and Lyngsten, 2020). Four themes will be used to gain insight into and highlight this impact on the auditor, namely: (1) the digitalisation of the audit profession and AI systems; (2) the audit process and ensuring audit quality; (3) AI and the future profile of the audit profession; and (4) the training and upskilling of South African auditors.

The inclusion and introduction of technological advancements, such as new or updated computer software, within the audit profession bring to question the implications of this on the auditor and their work/role. It has led to questions on what this means for the auditor's knowledge base and whether the auditor's role will change in this regard. With this shift comes the question of whether the auditors have adequate IT knowledge to

manage and still perform tasks within audit regulations and standards while ensuring good audit quality. Due to the magnitude of the above, the training and upskilling of auditors have become of the utmost importance. Rezaee, Sharbatoghle, Elam and Mcmicke (2018) opine that auditors must have a vast knowledge of their client's industry and business to perform a reliable and objective audit. The introduction and use of IT audit tools, such as audit software packages and tools, allow for this by enhancing how auditors perform their duties and evaluate audit evidence (AICPA, 2020). Thus, we must not neglect how the future of South African auditing might look, how this impacts the auditor, and how their role might be changed or steered towards change in light of these new developments.

> In the future, it is also believed that the auditor will make use of meta-information exchange, expert systems and clustering to perform their job (Vasarhelyi *et al*., cited in Holmes and Lyngsten, 2020).

Again, this leads to the question of whether South African auditors will be able to keep up with the transition to digitalisation and automation and if they can meet expectations or potentially be replaced by IT audit tools and audit software packages. Introducing and integrating these IT audit tools into the auditor's work processes creates a new work environment and, perhaps, new job role opportunities for the South African auditor. In the same light, it may present a lot of uncertainty. Therefore, auditors' work life and workflow experiences must be considered to have a holistic picture of what is happening within the audit profession in South Africa.

Furthermore, analysing the above sociologically would aid in answering some of the questions regarding this change. Moreover, thinking about the impacts of AI on the audit profession will assist in a better understanding of the transition to digitalisation and automation and what this might mean for the role of the South African auditor.

The Digitalisation of the Audit Profession and Artificial Intelligence Systems

This section starts by introducing the concept of digitalisation. According to Valenduc and Vendramin (2017), digitalisation can be described as the process of transforming data using digital technologies to make better business decisions, reduce human error, and add

value opportunities. In their description, they further add that a common way to think about digitalisation is that it is a process that combines two things:

> …continuing trends in the analysis of the information society or knowledge-based society; and significant breakthroughs the scope and impacts of which must be carefully assessed (Valenduc and Vendramin, 2017:123).

This is explained better by Babayeva and Manousaridis (2020), stating the following:

> The continuous transformation towards a digital society in which the consumption of IT is unceasingly growing, it is necessary to understand the way the audit profession is changed by digitalisation (Babayeva and Manousaridis, 2020:18).

This seems to be a growing trend in and outside of South Africa. Babayeva and Manousaridis (2020:18) state that an evaluation of the literature has demonstrated that the transition to a "digital society" has been the push factor for many audit companies in terms of determining the type of AI systems (i.e., audit software packages and IT audit tools) that will be utilised during the audit process and that will benefit the firm while staying within the Generally Accepted Auditing Standards (GAAS) (Pettigrew, 1991) and IRBA in the South African context. This has pushed many audit firms into investing billions every year in different kinds of software in order to have the upper hand over their competitors (Alles and Gray, 2020), investing in the latest and advanced technologies and innovations to enable an effective and efficient enhancement in the audit process (Alles and Gray, 2020). IT audit tools are applied to specific auditing tasks to resolve any errors within the audit that could have devastating financial implications for audit firms (Baldwin, Brown and Trinkle, 2007). This places importance on IT audit tools to avoid audit failures and the financial implications that may come with the use of these tools (Baldwin, Brown and Trinkle, 2007). Thus, it is for the reasons stated above that:

> …the study conducted by FAR (2016) hypothesises that automation and digitalisation of the auditing industry will result in structural modifications that will have a considerable impact on the entire audit profession (Babayeva and Manousaridis, 2020:18).

Furthermore, Babayeva and Manousaridis (2020) state that these new developments will enhance the advantages of the audit profession and benefit the auditor in conducting their duties effectively and efficiently. This has led to the introduction of three types of software systems to the audit profession to aid in making the audit process more manageable and avoid financial implications that could leave the audit firm in a bad financial standing (Albawwat and AI Frijat, 2021). The three audit software systems include assisted, augmented, and autonomic IT audit tools, each with its own use and way of helping the auditor perform their tasks to their full capacity and potential. Assisted IT audit tools help the auditor in the "decision-making process or react to different situations by repeating many of the tasks humans are already doing (mechanical intelligence)" (Albawwat and AI Frijat, 2021:756). Their functions are based on built-in procedures. Here, the software does the work while the auditor makes decisions, thus allowing for quick decision-making during the auditing process (Munoko, Brown-Liburd and Vasarhelyi, 2020). Augmented IT audit tools "interact with the environment and learn from the auditor (analytical intelligence)" (Guang-huan, cited in Albawwat and AI Frijat, 2021:756). In this phase, the software and the auditor work together and depend on one another, making joint decisions (Munoko *et al*., 2020). According to Albawwat and AI Frijat (2021:756), autonomous IT audit tools exhibit "intuitive and empathetic intelligence." Intuitive intelligence allows the AI system to solve issues in an innovative and effective manner.

However, the auditors' experiences are still not adequately captured regarding their use of AI and their perceptions of the software packages (Issa, Sun and Vasarhelyi, 2016). From the audit profession's viewpoint, this transition to digitalisation and automation provides new opportunities for the auditor but also comes with its own challenges (Holmes and Lyngsten, 2020). Studies outside of South Africa, such as that of Holmes and Lyngsten (2020), have shown that it adds pressure to be more knowledgeable about working with the new technologies introduced and implemented. It is inevitable that when technology meets human interaction, there will be a change in the work environment, hence the importance placed on the auditor's upskilling and the impact on their workflow. This also raises questions about the ethical nature of what is taking place. With the introduction of IT audit tools and their implementation, there is an increase in the number of autonomous decisions being made by algorithms "that use the information provided

without verifying the authenticity," which would bring about accountability concerns (Holmes and Lyngsten, 2020:5). This is something that seems to be prevalent is South African audit firms too. This then becomes problematic for the audit profession and possibly the auditor, as they are responsible for overseeing the audit process and ensuring the reliability of the audit.

Since the audit environment is highly regulated, both locally and internationally, the standards must be continuously updated and changed to ensure alignment with the automation of the audit process. Though this may differ in certain areas, given that not all the IT audit tools, and audit software packages used in South Africa are used in other countries, there is an international auditing standard that must be maintained. Thus, it is important to maintain the reliability of the audit, ensure its authenticity, and bring awareness to the auditor directly impacted by this.

A recurring theme in the research on AI systems (IT audit tools and audit software packages) and auditing is the usefulness of these systems to the audit profession and how they benefit audit firms by placing them above their competitors. International arguments made on this topic, such as that made by Baldwin, Brown and Trinkle (2007), state that without the correct computer software (IT audit tools, audit software packages), businesses will be unable to keep up with the digitalisation of work and will not survive it. This has sparked many debates on whether these IT audit tools are useful to the audit firm and the auditor (Baldwin, Brown and Trinkle, 2007). Among them is the use of IT audit tools to resolve audit issues, particularly in auditing and assurance (Baldwin, Brown and Trinkle, 2007), to benefit audit firms, which indirectly assumes that they benefit the auditor, in turn, pointing to a disconnect between the application of these IT audit tools, which are in the form of audit software and the experiences of those that use them (auditors) and oversee the audit process (Chowdhury, 2021). Such is also evident in South African audit firms (Myoli, 2022).

The Audit Process and Ensuring Audit Quality

It is a globally known fact that the auditing process is complex, involving tasks that require "structured, semi-structured and unstructured decisions" (Baldwin *et al.*,

2007:77). In its nature, the auditing process warrants a lot of uncertainty due to the risks that come with it. Therefore, those tasked with overseeing the auditing process (auditors, risk assessors) must possess the necessary skills, knowledge, education, experience, and expertise to manage the process without errors (Baldwin *et al.*, 2007). This is increasingly seen across the audit profession and can be seen as one of the many implied demands of using new technologies within the profession. The introduction of AI systems (i.e., audit software packages and Big Data analytics) is meant to improve the efficacy of the audit process tasks, in turn, "increasing the sufficiency (i.e., the appropriate amount) of audit evidence" (Kend and Nguyen, 2021:270). This suggests that those tasked with this responsibility should be experts with the required knowledge in auditing and IT to conduct audit tasks requiring AI systems such as audit software packages and audit tools. The advancement in audit quality should offer auditors a "smarter analysis and continuous auditing" (Babayeva and Manousaridis, 2020:19). As a result, the auditor should be able to explain smart analysis by focusing on the "automation of different repetitive audit tasks that increase the quality of the initial checks," thus, decreasing human error significantly (Babayeva and Manousaridis, 2020:19). Furthermore, this is said to put the auditor at an advantage as they are exposed to a faster and more efficient decision-making process that automatically fulfils their audit tasks—essentially, providing a service that keeps their clients happy and leads to lessened risk during the audit process (Manita *et al.*, cited in Babayeva and Manousaridis, 2020:19). Moreover, the move to digitalisation is meant to allow the South African auditor to provide continuous auditing that is not limited to what they are taught within their designated firm or what they might have learnt at a tertiary institution.

With more emphasis being placed on the importance of introducing and using IT audit tools, there is also a certain level of neglect towards the challenges this may pose to the auditor, and the South African auditor is not exempt from this fact. Kend and Nguyen (2021:270) state that the challenges auditors face have a lot to do with how they can derive value from the increased amount of information to which they are currently exposed.

The introduction and use of AI systems (audit software packages and IT audit tools) are said to "assist auditors by automating the collection, formatting and mapping of key audit objectives, evidence and procedures" (Kend and Nguyen, 2021:270). Therefore, the use of IT audit tools automates the audit process, requiring less input from the auditor and

doing more of the work for them. This is seen as a benefit to the auditor and, on the broader spectrum, the company they work for (Kend and Nguyen, 2021). The conclusion that these innovations benefit the firm and auditor seems somewhat problematic, as both entities must be considered to make that claim. In the context of South Africa and the audit industry here, it is important that the auditors' perceptions of the use of IT audit tools be further looked into to determine how South African auditors perceive this and how their work life and experiences are impacted.

Additionally, the innovations of the IT audit tools used in the audit profession in South Africa must be "incorporated into the current auditing framework" to not infringe on the auditors' rights or contravene how they do their work (Kend and Nguyen, 2021:270). Introducing AI systems, such as audit software packages and IT audit tools aimed at Big Data analysis in the audit process, does not always benefit the auditor. According to a study by Rose *et al.* (cited in Kend and Nguyen, 2021:271), "With 127 senior auditors from two Big 4 firms found that auditors have difficulty recognising patterns in Big Data visualisations. They concluded that their results suggest that Big Data visualisations used as evidential matter have fewer benefits when they are viewed before auditors examine more traditional audit evidence."

The above is significant for auditing firms on a global scale. This indicates that despite the introduction of innovations such as IT audit tools, there still is a need for old-school methods (Kend and Nguyen, 2021). The concept of modern-day auditing must be married to traditional auditing methods to avoid any possible constraints on how the auditor carries out their duties (Kend and Nguyen, 2021). The current auditing framework, as mentioned by Kend and Nguyen (2021), must ensure that the auditor's work life and experiences of the auditor are considered when it is being compiled. Furthermore, a study by Omitogun and Al-Adeem (cited in Kend and Nguyen, 2021:271) found that auditors in developing countries have good information technology skills and are well acquainted with Big Data and data analytics; however, they lack relevant technical skills and are unfamiliar with related data analysis tools.

Therefore, it is always best to consider South Africa as a developing country in order to make an informed deduction on where it lies in terms of the factors mentioned above by Kend and Nguyen (2021). Further research should be conducted to study the introduction

of new technologies in the audit process and the effects of International Auditing Standards (IAS), which should change the face of auditing and the profession in a developing country like South Africa. This would aid in a better understanding of the future of auditing in South Africa and the auditors' role, specifically in this context. The investigation should "explore key components for possible guidelines on data protection and ethical requirements in IT audits" (Omitogun and AI-Adeem, cited in Kend and Nguyen, 2021:271). Essentially, the way audit firms operate should still align with national and international audit standards and stay within the set regulations without placing too many constraints on general audit practice despite innovation and the differences in the status of the country where the audit is being performed. Thus, considering this digital transformation nationally, the South African auditor's role must be considered.

Artificial Intelligence and the Future of the Audit Profession

The gradual and continuous digitalisation process is the main factor that presents both challenges and opportunities for the audit profession and the audit profession at a global scale (Tiberius and Hirth, 2019). As such, to ensure that developing countries such as South Africa are not left behind, both the auditor and their clients must adapt to the digital transformation within the audit profession.

There is an increased emphasis on audit firms being able to recognise Big Data and develop "the ability to apply data analysis techniques," as well as creating a method that enables "their management executives to act on empirical information" (Kend and Nguyen, 2021:271). With the emergence of automation and digitalisation, there are new auditing methods. The audit profession in South Africa is not separate from the above and, as such, finds itself in a position where there needs to be the need to learn new skills and expertise required to manage this. In a situation where the skills, knowledge, identity, and expertise required for modern-day auditing are substituted for "more technical, 'number-crunching' types of competencies," this would have implications for how practice provides a suitable environment for the development of auditors as professionals (Turley *et al.*, cited in Kend and Nguyen, 2021:271). This then prompts the notion that further research must be conducted to document the changes occurring gradually within

the audit profession both nationally and internationally. This is to record the impact of these changes on the auditor in South Africa and, subsequently, the audit profession globally. Since IT audit tools aimed at the analysis of Big Data have significant implications for the auditor and the profession, audit firms must capture all changes in their "audit methodology and technologies" in response to the demands of their clients for "assurance and the challenges of the information age" (Kend and Nguyen, 2021:271). This helps to ensure adequate information for the auditor to derive value from and apply it to their day-to-day workings according to the set auditing standards in their country and the international auditing standards.

Kend and Nguyen (2021:271) provide an example of this,

> (…) to bring into play new business risk audit (BRA) methodologies, a number of the larger firms sought, through their auditing practice, to renegotiate the bases of their professional identity and status within audit firms and to widen their jurisdictional claims over other areas of expertise (Robson *et al.*, cited in Kend and Nguyen, 2021:271).

The demand for audit assurance and the additional pressure to produce high-quality audits is changing the nature of the audit profession. This change includes how the auditor does their work and the organisational structure as companies find themselves in a place where they must "renegotiate the bases of their professional identity" (Robson *et al.*, cited in Kend and Nguyen, 2021:271). This comes with the added pressure to perform efficiently in an economy and age (digital age) that forces international change in the audit environment. Though the new ways of doing audits may complement the South African auditor, any lack of education and training can be a source of stress in this regard. The auditor must know about the newly introduced software packages and audit tools and receive adequate training to avoid falling behind or becoming irrelevant in their own profession.

It is no surprise that introducing AI systems (audit software packages and IT audit tools) brings change to auditing operations and the auditor. However, auditors must be able to anticipate how this may change their work and profession and what this means for their future endeavours as auditors. South African audit firms and their managers (audit managers) should be able to anticipate the stressors that may come with a changed work

environment and take the necessary steps to reduce these stressors and alleviate them altogether. This is attributed to the fact that they must derive adequate valuable knowledge from the information available regarding the changes occurring within their profession that are also specific to their country (South Africa). Despite these changes, assuring that IT audit tools are currently in use within their place of work is still expected.

The lack of universally adopted audit standards that are explicit to the use of AI, that affect and impact the audit process, and the type of AI system used (Information Systems Audit and Control Association, 2018) can be an issue for the auditor during the audit process. These IT audit tool solutions can vary from one type of audit software to another, making the audit process even more complex. Additionally, this very complexity of IT audit tools and the "…shortage of qualified data scientists will routinely lead to the outsourcing of AI development projects to one or more third-party resources…. This will subsequently increase the challenge for the AI auditor" (Information Systems Audit and Control Association, 2018:5).

Therefore, this challenge must be avoided as it could increase the auditor's job stress. With these challenges in mind, South African audit professionals must upskill themselves in order to keep up with any new responsibilities that may be thrown their way. Babayeva and Manousaridis (2020) further state that the upskilling of auditors is a possibility and could benefit the auditors and the profession. In doing so, ensuring that the digitalisation of the audit process does not lead to the "loss of job opportunities" (Babayeva and Manousaridis, 2020:1). Moreover, Babayeva and Manousaridis (2020:21) state that what auditing might look like in the future or what it looks like currently with many companies embracing the digitalisation and automation of the audit, many (auditors) "must possess a 'hybrid' of skills that were not necessary for the past" (Babayeva and Manousaridis, 2020:21).

Despite using new technologies (i.e., audit software packages and tools) in the audit process, experts state that these new technologies cannot and will not replace the auditor (Tiberius and Hirth, 2019). Tiberius and Hirth (2019) further elaborate that these new technologies will lessen the auditors' workload, providing the auditor with some relief and support despite the auditors' job requirements becoming a little more complicated. Therefore, Tiberius and Hirth (2019) believe that firms and auditors alike must think

ahead and have insight into the recent developments to keep up with digitalisation. This will aid in a smooth transition and in a similar plight to ensure that South African auditors are not left behind in the process; firms should practice foresight to support decision-making, improve long-term planning, enable early warning, improve the innovation process, and improve the speed in reacting to environmental change (Iden, Methlie, & Christensen, cited in Tiberius and Hirth, 2019:1-2). This creates a competitive advantage and increases profitability (Rohrbeck and Kum, cited in Tiberius and Hirth, 2019:2).

The Training and Upskilling of Auditors

In the face of new technological developments, job retention occupies much of the literature (Bughin *et al.*, 2017). The three matters that come up in this regard are training, upskilling, and the possible change of the audit curriculum in order to avoid job loss. Contrary to popular belief that AI might eventually replace the auditor, the auditor could get in front of the potential threat by using resources like training, which is available to improve their skills, knowledge, and expertise (Bughin *et al.*, 2017). This will benefit the South African auditor.

By utilising the information given or available through training, technology/IT auditors[1] and general auditors[2] alike will be well-equipped for the transition to digitalisation and automation and will be able to keep up with some of the other changes that are yet to come, suggesting that they will not be significantly affected. In this way, the general auditor could avoid the "black box effect" and the challenges that may come with a lack of knowledge regarding the new technologies being introduced and those yet to come (Bughin *et al.*, 2017). The black box effect assumes that only technology/IT auditors are responsible for how the auditing algorithm works, which is seldom the case as the development of the algorithm solicits the input of software developers as well as the general auditor (Bughin *et al.*, 2017). With auditors being tasked to use AI in the audit

[1] An Information Technology (IT) auditor evaluates and assesses a company's information technology systems, processes and controls to ensure that the company adheres to the relevant regulatory frameworks and set standards (4 Corner Resources, 2023).
[2] General auditor is an individual that examines and analyses the accounting systems of a company and ensures that that the company adheres to its legal requirements, ensuring that it stays within tax legislation requirements (IRBA, n.d.a).

process, it is only natural that they will also become a part of it. Therefore, when technology/IT auditors oversee the "governance of AI and the integration among systems" (Information Systems Audit and Control Association, 2018:6), general auditors should be included to ensure that their upskilling takes place. Although "algorithms should be audited by model specialists, auditors having a basic understanding" of these procedures and tasks should be something that occurs (Information Systems Audit and Control Association, 2018:6). This would benefit the auditors and the profession by ensuring that auditors at least have knowledge of the basics and that they can build from that onwards.

Additionally, industry support can go a long way by providing training in the necessary skills needed to operate audit software and work with it during the audit process. Audit firms must consider the auditor's perceived experiences with the audit software by investigating how they could make this transition smoother (Bughin *et al.*, 2017) to benefit the auditor and the company they work for. Doing this creates a better and healthier working environment for the auditor, benefitting both the auditor and the company for which they work, and, as such, should apply to South African audit firms. This leads to a less stressful transition into this digital shift, whether with the new or current audit software and tools. The knowledge and experience that auditors have with audited cloud computing or cybersecurity can be used as a point of reference when learning how to operate and use the newly introduced audit software packages (Information Systems Audit and Control Association, 2018:6). Moreover, the business audit company can teach the IT and governance aspects of auditing and assurance to general auditors, equipping them with and enabling them to obtain new skills that can benefit them currently and in the future. In summary, thoroughly investigating the auditors' experiences with audit systems during software and audit tools will provide an understanding of building new audit objectives (ISACA, 2018).

Baldwin *et al.*, (2007) state that the main reason the audit profession is well-versed and recognised is due to the manner in which it is a specialised area that requires appropriate education, experience, and expertise for which a select few get trained. Furthermore, the current domain of audit and assurance is arguably the most recognised within the audit profession (Babayeva and Manousaridis, 2020). This explains the continuous adoption of IT audit tools within the audit profession. When examining the audit software, it is easily

recognisable that these IT audit tools depend on human knowledge; thus, they depend on the auditor and others involved in overseeing the audit process. Auditors are, therefore, expected to be competent and possess the IT skills and knowledge needed to keep up with the digital transformation within the profession (Babayeva and Manousaridis, 2020). Training is thus necessary. Auditors must feel confident and trust in their capabilities to effectively operate the IT audit tools (audit software packages and tools) they are exposed to at work (Babayeva and Manousaridis, 2020) in order to ensure quality auditing. In the South African context, this leads to the conclusion that more focus should be on alleviating auditors' concerns about using AI systems, and more emphasis should be placed on developing and sharpening their skills (Albawwat and AI Frijat, 2021:760). Auditors can do this by comprehending the effects of digitalisation and ensuring that they seek the necessary training and upskilling to cope with the technological transformations (Babayeva and Manousaridis, 2020). Additionally, audit firms can offer

> "Formal support" [by] providing training and improvement programs related to the technical transformation and including alterations in the work circumstances in order to support the upskilling process of employees (Burke, cited in Babayeva and Manousaridis, 2020:19).

This reassures the South African auditor of their job security and ensures they benefit from this digital transformation. The main objective of auditing is to "evaluate the reasonableness of financial statements, thus determining if the financial statements properly reflect the performance of the business" (SAICA, cited in Coetzee and du Bruyn, 2003:21).

Therefore, with the digitalisation of the audit profession in South Africa, auditors must upskill themselves in order to keep up with new technological developments within their profession. Those yet to join the profession are equipped with the necessary hands-on experience with IT audit tools before they enter the audit profession in South Africa. A South African study by Ahadiat (cited in Coetzee and du Bruyn, 2003:21) stated that it is necessary to ensure that students receive practical training on the necessary digital technologies.

Coetzee and du Bruyn (2003:22) posit that students are exposed to "audit software in their syllabuses." This gives them the opportunity to know what to expect when they enter the

audit profession and become a qualified auditor in South Africa. It also ensures they are knowledgeable and competitive, increasing their chances of employment as an audit professional and allowing them to move up the corporate ladder. The International Federation of Accountants (IFAC) and the South African Institute of Chartered Accountants (SAICA) issued guidelines that advocate for the introduction of computer technology in the accounting curriculum (Coetzee and du Bruyn, 2003). "Guideline number IEG 11 focuses specifically on computer technology in the accounting curriculum" (IFAC, cited in Coetzee and du Bruyn, 2003:23). In the same light, IRBA issued the South African Auditing Practice Statements (SAAPS), which should work as a guideline on how to navigate working with IT audit tools in the audit profession (Coetzee and du Bruyn, 2003).

However, it must be considered that this transformation does not come easily for auditors. According to Babayeva and Manousaridis (2020), this transformation and digitalisation of the audit profession can be met with resistance because human beings struggle to adapt to change (Jabil, cited in Babayeva and Manousaridis, 2020). "The audit profession has a reputation for being steady" (Raphael, 2017:32), meaning that transformations such as introducing and integrating IT audit tools into the workplace will not occur unless completely necessary. According to Jansen *et al.* (cited in Babayeva and Manousaridis, 2020), these changes must be willingly accepted, as in many cases where clients prefer hardcopies despite the digitalisation of auditing. Additionally, the digitalisation and automation of auditing can lead to fear of job loss on the auditors' end, which can also lead to resistance, and such is the growing trend in the South African audit profession (Coetzee and du Bruyn, 2003). Therefore, as already mentioned above, it must be considered that the auditor's mind be put at ease through training and support to ensure an easy transition. As can be imagined, this can negatively impact the auditors' work life and overall perception of the audit software packages and tools introduced. This points to the neglect of the human aspects of the auditor's work life. Thus, the advocacy of training and company support from audit firms to their auditors.

It is anticipated that the "automation and digitalisation of the audit profession will bring about structural changes that will have a profound impact on the entire audit profession" (Adiloglu and Gungor, 2019:208). Therefore, crucial to the broader understanding of the effects of automation and digitalisation on the audit profession are "Big Data, blockchain

and cyber security issues" (Adiloglu and Gungor, 2019:209). With more audit companies using digitalised business models, this will affect how the auditor performs their daily work tasks and the type of services that audit companies can offer their clients. This can be seen in the following things (Adiloglu and Gungor, 2019:209):

1. The automated recording of audit transactions
2. The improvement of fraud detection using advanced machine learning
3. The analysis of "unstructured data" (i.e., emails, social media broadcasts, and conference call audio files) (Adiloglu and Gungor, 2019:209)
4. The optimisation of the auditor's time allows for the "human judgment to analyse a broader and deeper set of data and documents" (Adiloglu and Gungor, 2019:209)

The synthesis of the above must match the benefits of their implementation with the perceptions of the auditor and how they impact their work life and work experiences (Omoteso, 2012). This is to ensure that a healthy relationship can be developed between the auditor and the AI systems they are exposed to, creating a healthy workflow and work environment. Despite implementing AI systems such as audit software, it is vital to recognise the reoccurring issue of increased pressure on the auditor that comes with this transformation and move to automation and digitalisation (Omoteso, 2012). Together with the implementation of automation, the digitalisation of the South African audit profession raises questions about the legitimacy of the audit profession. The company must consider the auditor's role and how it will be changed and impacted by this change. It is also vital to consider that the implemented IT audit tools still need the input and assistance of the auditor. As such, the audit company would have to consider this while also considering the effects this has on the auditor. Paramount to this issue is finding ways to ensure this transition is as smooth as possible and solutions that will benefit the firm and the auditor.

With the continuous digitalisation process within the auditing profession, automation of the audit process has become an unavoidable part of any business audit profession that aims to thrive in the digital working age (Fotoh and Lorentzon, 2021). It is a change that impacts not only the organisational structure but also those in it, particularly the auditors' place of work, essentially pointing to the training and upskilling of their staff. The

digitalisation and automation of the audit process is a change that requires the members of that company to work together and help each other to make the transition easier (Zhu, Dong, Xu and Kraemer, 2006). Ensuring that all accept the change and that it has a positive impact involves unlearning old auditing practices by the auditor and adopting new methods meant to prosper the auditor and the profession. Adopting and adapting to these new working methods in work life comes with its own implications and challenges, all of which must be considered and accepted by the audit company and the auditor. Although it can be said that these changes will be beneficial to both the auditor and the company, we must not neglect the challenges that this may present for the auditor. This can be attributed to the fact that auditors are expected to meet the audit firm and clients' demands, which have become more complex due to the digitalisation and automation of the audit process (Arsenie-Samoil, cited in Ottemo and Odden, 2019), all while adjusting to the use of IT audit tools and the new auditing techniques of completing auditing tasks. It also adds to the challenge of completing these tasks according to and within the already set auditing standards. Considering the above, it is no surprise that this change can be both a threat and insecurity to some and an opportunity for others.

Furthermore, in implementing IT audit tools in the audit process, there are also debates on which part or parts of the "audit process should be targeted for automation" (Moffitt, Rozario and Vasarhelyi, 2018:5) and how this may change the role of the auditor when it comes to that specific part of the audit process. Moffit *et al.*, (2018:6) suggest that in this regard, the auditor's role would be changed by "replacing perfunctory tasks and emphasising higher order thinking skills." Once more, it is highlighted that having the necessary skills and expertise to use IT audit tools requires training, as the auditor would be entering unfamiliar territory. It is noted that there are different types of data; therefore, the auditor that analyses these must have vast knowledge and the necessary expertise on the data and AI system used to analyse it (Moffitt *et al.*, 2018). This is where "Big Data and data analytics" comes in (Adiloglu and Gungor, 2019:209).

McKinsey (cited in Adiloglu and Gungor, 2019:209) describes Big Data as "beyond the ability of typical database software tools to capture, store, manage, and analyse." Here, the analysis of large amounts of data is converted into "actionable insights," allowing for the "full automation of entire processes" (Gotthardt, Koivulaakso, Paksoy, Saramo, Martikainen, and Lehner, 2020). Analysing this data could enable the auditor to conduct

risk assessments in real-time and identify unusual patterns in data that may point towards fraud and any errors or irregular data. Although Big Data analytics can be an advantage to the audit company and the auditor by enabling them to analyse large datasets simultaneously, this can lead to the exploitation and misuse of the data at hand (Gotthardt *et al.*, 2020), leading to unreliable audits. One of the challenges the audit profession faces is the full adoption of Big Data analytics and legitimacy. With some of the audit functions that are at play during this age of digitalisation and automation, some of the audit tasks are said to stray outside the audit profession and the audit profession as we know it into other fields such as supply chain management, health care, and others (Rickett, 2017). While auditors may have some of the necessary skills, knowledge, and expertise to manoeuvre these new developments, they may still not have adequate skills, knowledge and expertise needed to apply the appropriate dialectics to "build predictive analytic models, and this could result in potential false positives and inefficiencies" (Rickett, 2017:1).

Here, we witness the audit profession presented with the opportunity to expand on their knowledge and expertise by perhaps "integrating data analytics courses into their curriculum" as well as their training courses (Rickett, 2017:1). As such, debates have surfaced on whether the audit profession can and does provide the necessary knowledge and skills needed for data analytics (Rickett, 2017). Therefore, it should be a prerequisite for integrating Big Data and data analytics into the curriculum of those yet to join the profession (Rickett, 2017). Auditors who are well-versed in audit knowledge should be married to the concept of auditors having advanced statistical skills and the required technological expertise to work with significant data sets during the audit process. When picturing a modern-day auditor and the future profile of auditing, one should be able to envision an auditor that has a complete understanding of the audit process with the inclusion of analytical skills, "extracting and structuring Big Data and can effectively utilise data analytics techniques" (Rickett, 2017:1). Audit companies should be able to capitalise on this, if they invest in the training of their staff and the audit profession, in the investment of educating those that are yet to join the profession. Furthermore, although formal support can go a long way in solving and avoiding the challenge of lack of training and education, Ottemo and Odden (2019:45) found that informal support can be equally crucial to auditors "both in facilitating, and impeding the engagement in digital

work tools," when coming from their company of work. This brings the study to the next topic of discussion under entities crucial to the digitalisation and automation of the auditing profession.

According to Fanning and Center (cited in Adiloglu and Gungor, 2019:209), a blockchain is a distributed database that maintains a continuously growing list of data records that are hardened against tampering and revision, even by operators of the data store's nodes.

Blockchain technology is an auditing tool that auditors can use to perform tasks "without centralised transaction processes" (Adiloglu and Gungor, 2019:210). They further state that each blockchain keeps and records copies of current and previous transactions and operations within its chain; getting hold of these copies is possible (Deloitte, cited in Adiloglu and Gungor, 2019). Additionally, the lack or absence of one main authority/administration control warrants that all inputs are "viewed, approved and recorded by the user" (Adiloglu and Gungor, 2019:210). Emphasis is placed on the type of security and administration that needs to be used, as auditing's main purpose is to ensure that "things are done by the book." It becomes even more critical that the lucidity of the blockchain system be apparent as it does not enable users to eliminate or modify any of the transactions or operations made (Ovenden, cited in Adiloglu and Gungor, 2019). This makes it difficult to work, especially with adjusting and readjusting audit standards to fit into the wave of a digitalised auditing process.

Moreover, since a blockchain enables the user to record a transaction in real-time, it eliminates any fraud that may occur, aiding the auditor in avoiding litigation (Deloitte, cited in Adiloglu and Gungor, 2019). "A blockchain comprises a verifiable record of each process performed on the chain" (Adiloglu and Gungor, 2019:210); hence, the above statement. The fact that the blockchain has all these elements has improved how data can be stored and recorded, increasing the presentation of how audit tasks can and are performed (Deloitte, cited in Adiloglu and Gungor, 2019). To maintain the reliability of the audit, the data collected, stored and processed under these conditions, the auditor and the firm must invest in cybersecurity (Fotoh and Lorentzon, 2020). It is also crucial to the audit process that there is no audit expectation gap, which is "the differences in beliefs and desires between auditors and financial statement users regarding the duties of

auditors" (Fotoh and Lorentzon, 2020:2). Auditors must know their role in the use of the blockchain to avoid any confusion and putting the auditing firm under audit litigation.

In line with ensuring that audit fraud or any misuse of the data collected and stored is the challenge of providing adequate cybersecurity to protect it all. Cybersecurity is described as the measures taken to protect company data held on computer-based systems from risks of loss, damage, unauthorised access and misuse of unauthorised persons (Adiloglu and Gungor, 2019:210). The audit company must provide full-proof cybersecurity with minimal to no discrepancies. Issues that may arise from not having this can lead to the inadequacy to carry out the most basic of tasks, loss of intellectual property rights, and even great damage to the reputation of that designated audit firm as well as the auditors responsible for the information that would have been lost, damaged or tampered with (IIA, cited in Adiloglu and Gungor, 2019:210).

As can be imagined, this adds pressure to the auditors as they must ensure that all operations are done correctly while using audit tools and computer-based systems (IT audit tools, particularly audit software packages) that may be new or foreign to them. This also alludes to the auditor getting adequate training on these systems and tools to ensure they can fulfil their duties to the best of their capabilities without putting themselves or the company they work for at risk. This comes as no surprise as cyber-attacks have become a frequent occurrence, placing audit companies and their stakeholders (the auditor and their clients) at risk for consequences that may arise due to the attack being successful (IIA, cited in Adiloglu and Gungor, 2019:210). At the potential success of a cyber-attack lies the following violations for the audit company affected (Adiloglu and Gungor, 2019:210):

- Financial systems and assets through misuse, theft and extortion
- Intellectual property rights and business secrets through spying
- The brand and interest assets through defamation, accusation, and disclosure of secrets
- Business continuity through sabotage and interruption of operations

One of the biggest challenges is ensuring that the auditor and audit profession can provide adequate training to avoid mishaps. Companies must ensure they shield not only

themselves, but also their stakeholders. With the evolution of technology daily, the audit profession and the sum of its parts must put measures in place to strengthen their cybersecurity to stand against any cyber-attacks that could cause problems.

Considering the above, there is no doubt that some efforts to digitalise and automate the audit profession will be met with resistance and countermeasures. The automation and digitalisation of the audit profession are new and can sometimes come across as a foreign subject to the parties subjected to its implementation. It aims to change or alter the traditional way of auditing, which can bring about a certain level of discomfort and uncertainty for the auditor (Guo, 2021). This aligns with having to change as an auditor, develop and improve auditing skills and knowledge, and adapt to the new auditing environment through digitalisation and automation. Despite the efficacy of IT audit tools and the benefits that come with them, adjusting to this new way of doing things can be challenging for the auditor. Studies have shown that although digitalised business models are being used more often, the audit profession is still slow in adopting new technologies (in this case, IT audit tools, such as audit software packages), suggesting that audit professionals might not be warming up quickly enough to the adoption of AI models and Big Data (Alles, 2015).

Another challenge that arises regarding adopting and implementing IT audit tools (i.e., audit software packages) in the audit profession is unlearning. Introducing new technologies and techniques to traditional auditing means unlearning the old way of performing audit tasks during the audit process and incorporating the new methods. This aligns with ensuring a way forward for the auditing profession, which is promising and beneficial to the audit company and its clients. However, the slow adoption of this new way of doing things has created somewhat of what Fotoh and Lorentzon (2020:2) called an audit expectation gap. Fotoh and Lorentzon (2020:2) describe the audit expectation gap as the differences in beliefs and desires between auditors and financial statement users regarding the duties of auditors.

Therefore, all parties involved must have a uniform understanding and adoption of the new technologies and techniques applied to the auditing process. Clear expectations must be set out, along with formal guidelines and the potential issues that may arise with using AI systems (i.e., audit software packages and IT audit tools) that will be used during the

auditing process (Ottemo and Odden, 2019). Again, this can be done through adequate training and considering the possible risks the auditor may encounter should anything be done incorrectly during the auditing process.

Most research studies on this subject matter are often focused on "an audit firm level of analysis, addressing how audit firms themselves prepare for, implement and react to change" (Bovey and Hede, cited in Ottemo and Odden, 2019:7). However, the same amount of attention and resources is not allocated to research on auditor perceptions and experiences of these changes (Bramford and Forrester, cited in Ottemo and Odden, 2019). Nevertheless, there has been a growing consensus that auditors' views, perceptions, and experiences of introducing and implementing AI models are just as essential to this transition (Ottemo and Odden, 2019). It is crucial to the success of this transition to digitalised and automated business models that the behaviours and attitudes of the employees be considered. This ensures that the resistance challenge is overcome or minimised, which, in turn, reduces employee turnover.

Conclusion

Auditors must be rigorously and adequately trained in the digitalisation and automation of the audit process. It is also crucial that auditors take the initiative to upskill themselves outside of the training they receive in their workplaces to stay in the know. Although advantageous to their designated place of work, the effects and impact of the digitalisation and automation of the audit process must be considered. If IT audit tools benefit the auditor without disadvantages, it would be a disservice to the auditor and the audit profession. Introducing and using IT audit tools might increase the audit's reliability as it can aid in reducing and alleviating human error. Therefore, ensuring that auditors are adequately trained on the introduced IT audit tools could remove a lot of doubt and uncertainty about their abilities to lower this risk even further, thus proving helpful in maintaining audit quality. The continuous use and dependence on AI in the audit process can also lead to questions about future auditing profiles. These questions are based on the potential of AI taking over the auditor's job, as well as retention and job security. As such,

it is significant that this transition is not taken lightly and that auditors keep up with the technological advancements within their profession and industry.

Although the benefits of IT audit tools cannot be denied, adopting these systems is still relatively slow (Rickett, 2017). This can be attributed to challenges such as a lack of education and training on the newly introduced IT audit tools and the limitations of sticking to auditing standards. Furthermore, the fact that auditors may be inexperienced in using these technologies can lead to discomfort and fear of being at litigation risk if anything were to go wrong; thus, employee training and education are critical.

The audit process continues to evolve with digitalisation; as such, challenges such as this need to be addressed by implementing organisational support and adequate training. This should expand not only into the workspace but also into university education to have an early start on the solution. There is a need to ensure updates and adjustments to the auditing standards to avoid any setbacks during this transition to automation and digitalisation of the audit process (Rickett, 2017). Therefore, to prevent and possibly eradicate the fear of job loss that may hover over the auditor's mind, the perceptions and experiences of the auditor must be considered. This would ensure that studies get an in-depth understanding of the audit profession for auditors. As the audit profession continues to utilise digitalisation and studies consider how this will change and possibly restructure the audit profession, the parties involved are paramount to a complete and in-depth understanding of this transformation. Furthermore, applying insight to the research on AI and the audit profession will move the audit profession towards a new and improved, inclusive direction where all aspects are considered.

Ensuring that adequate planning of this shift to automation is done before it is introduced and implemented at any firm is significant to the success of the automation and digitalisation of the audit profession (Betti, Sarens and Poncin, 2021). Additionally, it is the inclusion of audit professionals in those firms in this process, offering company support to consider the human aspects that are affected during this transition instead of focusing on just the technological advances being introduced. As much as a lot of focus is placed on the companies primarily, attention should also be given to the auditor to better understand what could benefit both entities.

Lastly, the human aspect of work should not be ignored. Businesses must note that change could cause fear and resistance, whether passive or otherwise. Protecting themselves alone will not make for a positive and conducive transition to the digitalisation and automation of the audit profession. There must be an investment into the audit company's human resources to achieve a holistic transition that will prosper the audit profession rather than quell it.

CHAPTER 3 – RESEARCH METHODOLOGY

Introduction

Chapter three outlines the methodology and research design used in the study, including the methods for selecting research participants and the study setting. It covers the eligibility criteria for participants, sampling methods, data collection process, and data analysis. Additionally, ethical considerations will be addressed.

As mentioned in chapter one, the main purpose of the research study is to investigate the work life and work experiences of South African auditors in the audit profession. The aim is to gather insight into the thoughts and experiences of South African auditors regarding their use of IT audit tools like audit software packages and audit tools in their workplace. Moreover, it is to see how this has impacted, shaped, and possibly changed how the auditor experiences and does their work, as well as to find out how they feel about their work environment. This aligns with the increasingly digitalised nature of the audit process and how it is continuously improving and advancing technologically. In line with furthering the aims and objectives of this dissertation, four themes were identified to achieve this: the digitalisation of the audit profession and IT audit tools, the audit process and ensuring audit quality, AI and the future profile of the audit profession, and the training and upskilling of auditors. These aimed to illustrate and contextualise the key concepts and notions under investigation in this dissertation. The themes were to serve as guidance on what to look for when investigating to answer the research question (see above).

As outlined in chapter one, this dissertation asks the following question: *"How has the introduction of Artificial Intelligence systems changed the audit profession and workplace, and what have been the experiences of South African Auditors?"* To answer this, the following themes were identified:

- First, the gradual changes that are taking place in the auditors' workplace must be understood, thus ensuring an understanding of the changes in the South African audit profession. This provided insight into how the profession is influenced and

changed by introducing, continuously upgrading, and integrating IT audit tools into the auditors' work processes.

- Second, can these IT audit tools (audit software and audit tools) be deemed valuable enough to ensure quality auditing, reduce human error, and reduce the auditors' workload? This aided in gauging the auditors' experience with the IT audit tools with which they work, in turn, being able to deem the benefits they may present for the auditor. Imperative to this was to consider the human aspect of auditing, including giving the auditors a voice rather than neglecting the impact that these have on them and the implications on their job role.
- Third, was a concern for the future of South African auditors and the future profile of the audit profession in South Africa. This ultimately led to the question: Will auditors be able to upskill themselves with the necessary skills and knowledge needed to keep up with this shift and transformation of the audit process and audit profession?
- The fourth and final theme aimed to establish and understand the thoughts, feelings, and perceptions of South African audit professionals on introducing and integrating IT audit tools into their work processes. The purpose of this dissertation was to gain insight into the auditors' views and if there was any conflict between the introduction of IT audit tools into their workplace and their professional values and ethics.

The themes stated above were significant to the investigated subject matter of this dissertation. They were central to answering the main question for the purpose of the research investigation and gathering information on the audit profession workspace, the auditors' experience with regards to the IT audit tools they work with, and what the implications of the use of IT audit tools will be for the audit profession, and what they might be in the not-so-distant future. Additionally, the themes aided in obtaining rich and continuous information for the purpose of analysis and generating findings from the data collected. Lastly, they aimed to spark interest in future research.

To achieve this, the study adopted a qualitative research approach. This method was selected because it is suitable for thoroughly investigating the study's topic, yielding the best outcomes as it allows for rich and continuous data to be obtained. A qualitative

research design ensures a reflexive and logical process when conducting a research project in all its stages (Hammersley and Atkinson, cited in Maxwell, 2013:214). For example, when conducting a qualitative study such as this one, the different stages of the research (i.e., data collection, data analysis, developing and modifying the theory, elaborating the research questions, and identifying factors that may threaten the validity of the research study) almost always occur at the same time (Maxwell, 2013). As such, using a qualitative research design allows for the ordering of the stages in a reflexive manner, allowing for order to be maintained.

Moreover, this research design method allowed for the different stages to be modified or changed whenever there were any new developments within the research. In addition, qualitative research allows for an inductive approach. This opened room for the data collected and analysed to be used to draw a conclusion where the information gathered could be used for further research.

The methods used to conduct this research study are outlined: First, the theoretical reasoning behind the chosen method of research design is outlined; thereafter, the process by which the research study was carried out is discussed in detail, including the data collection process, the analysis of the data collected, and the ethical considerations followed to ensure the research study was conducted responsibly. Finally, the limitations/challenges experienced while conducting the study are discussed.

Research Design

This research study aimed to analyse the experiences of South African audit professionals in their utilisation of IT audit tools (i.e., audit software packages and tools) and the impact on their work life and work experiences. In this dissertation, a qualitative research design was employed (Maxwell, 2013), more specifically, a TA, which allowed for the identifying, analysing, and interpreting of any patterns of meaning within the data collected to create themes (Clarke and Braun, 2017). As the investigated phenomena of this research study is a social process, using a qualitative research design, such as a TA, enabled the uncovering of the auditors' perceptions, thoughts, and opinions on the subject under study (Clarke and Braun, 2017).

Furthermore, the utilisation and implementation of the TA allowed for an exploratory perspective to be used in this investigation as it is deemed appropriate for the research study (Yin, 2003). According to Haverkamp (2005:147), a qualitative research design can be defined as "… an emphasis on the particularity of experience rather than a search for universal laws or generalised processes."

This dissertation emphasises the audit professionals' individual experiences with the audit software packages and tools utilised daily at work. It focuses on the impact and influences these software packages and audit tools have on how they experience their work and their work environment in their individual capacity. Thus, it places the qualitative research design at an advantage as it provides an opportunity to conduct the research investigation in an inductive and deductive manner. This suggests that the dissertation considers the changing nature of the auditors' workplace and its implications on their work, especially how they experience their work in light of working with IT audit tools. Additionally, implementing inductive reasoning allows for a back-and-forth movement from theory to data and vice versa, making it applicable to investigating the subject matter under investigation (Bryman and Bell, 2011).

As such, with the denotation of how this dissertation fills the missing gap under study, a qualitative data analysis method, such as the TA, is deemed suitable for a conclusion to be formed from the data collected that is to be analysed regarding the subject matter investigated for this study. Furthermore, applying a TA analysis allows for a certain level of flexibility, alleviating rigidity, which makes it beneficial to the researcher, the research participants, and those interested in researching the same topic in the future. This qualitative data analysis method (in a qualitative research study) presents opportunities for movement between data and theory to extract and attain rich information due to its iterative nature (Maxwell, 2013). Again, due to its flexibility, it also allows for the components of the qualitative research design to be modified or reviewed at any time if there are changes or new developments within the investigation that require it to (Clarke and Braun, 2017).

Therefore, the emphasis that the qualitative research design places on human experiences offers a platform of inquiry that aims to add knowledge and insight to the social sciences. In turn, proving beneficial, using a qualitative approach and its methods will provide new

discernments and understanding of the meanings of the information gathered from the data analysed. This will enable the researcher and possibly the reader to reconstruct, unlearn, and learn new meanings from the experiences of the research participants, in turn, understanding the research participants from their own point of view rather than preconceived ideas and expectations. Moreover, the qualitative research design investigates human experiences in real-time within specific settings, allowing for a more holistic perspective to be gained in its nature, detailing and capturing the participants' reasoning, motivations, thoughts, preconceived notions, current views, and opinions rather than construe them.

Study Setting

This research study was based in South Africa and thus conducted locally. The auditors recruited and interviewed for the purpose of this study were working in firms located in the Gauteng Province in South Africa. The focus of the investigation for the research study is on audit professionals within the country. Therefore, the audit professionals selected for this study's research participants came from different provinces of South Africa. For this reason, using a virtual means to conduct the interviews was deemed appropriate. Moreover, this data collection method made connecting easier because it was time and cost-effective for both entities (the researcher and the participants). It also made for a more beneficial method of conducting the interviews than conducting the interviews physically because most of the research participants had busy schedules and would be unable to meet physically. Therefore, conducting the interviews virtually allowed them to make time (some during office hours and others outside) for the interview.

Additionally, with South Africa still experiencing the COVID-19 pandemic, the data needed to be virtually collected in order to adhere to COVID-19 regulations. As such, there was no study setting for the participant interviews. This was to ensure the safety of the researcher and the participants. Therefore, the interviews for this study were conducted virtually through Zoom, a video communication application. Although this is a virtual platform, it still allowed for the implementation of qualitative research components in the results that it yielded.

Using a virtual video communication application like Zoom allowed for the benefits of face-to-face interviews. Although the research participants could join without video, the researcher could still obtain a lot of information from the participants, allowing for enough data to be collected for the purpose of this study. Additionally, having an interaction where both the research participant and researcher could interact allowed for a more fruitful engagement. Zoom benefited the researcher and the research participants by creating a similar climate to a face-to-face interview. It allowed for the collection of rich data (in-depth data collection) and comprehensive understanding; it also allowed for probing to better understand the participants' responses (May 2011). Hence, this method of interview conduction was best suited as it allowed for the best possible results and outcomes. Moreover, using Zoom to conduct the interviews allowed the research participants to ask still questions where they needed clarity, which was beneficial to the dissertation. Although conducting the interviews did not allow for full interpersonal interaction, it still allowed for a semi-warm interaction, which was beneficial to extracting as much data as needed from the participants.

Research Participants

The research participants for this study comprised South African-based audit professionals, both men and women, aged above 18 years. This ensured that the research participants selected for this study were consenting adults who were registered and working as auditors (or at least had prior experience as an audit professional). This was part of the criteria for consideration for participation in the study. The sample population's research participants were placed into two cohorts: Cohort A, comprising audit professionals with five years of audit experience or less, and Cohort B, comprising audit professionals with five years of audit experience or more. The purpose of having two cohorts of audit professionals was to have a sample population with adequate knowledge and experience in the old and the new audit software packages and audit tools that the auditors use at work.

Cohort A comprised research participants with five years or less of working experience. The research participants were registered audit professionals working at various audit

firms. This was done to get insight into their thoughts and perceptions of the audit profession and to understand their work life and work experiences regarding the digitalisation and automation of the audit process. It was also to ascertain their views of the entities above, considering having recently joined the audit profession. Additionally, it was to establish if they felt they had adequate support from their place of work to adapt to working professionally as an auditor and if they thought they could stay in the profession for extended periods, considering that computer technologies were rapidly advancing.

Cohort B comprised audit professionals with five years or more of audit experience. Considering that the research participants in this group were experienced, it enabled some insight to be gained regarding the use of audit software packages and audit tools and allowed for differences between both cohorts to be identified as a means to understand the extent to which the profession had changed over the years. Additionally, it identified any similarities in work experiences and work-life between Cohorts A and B. This allows for an overall understanding of the profession from the perspective of those who have only been in the audit profession for a long period of time.

Sampling

Both Cohorts A and B included a key informant that fit the criterion needed to qualify one as a participant. The key informants for both Cohorts A and B were individuals that I know personally. The key informant for Cohort A was an individual I previously went to tertiary with, and the key informant for Cohort B was a relative who is also a qualified auditor working for one of the Big Four firms in South Africa. The key informants referred the researcher to other participants who also fit the selection criterion of qualified audit professionals as research participants. The criteria included the following:

- Participants must be South African residents
- Participants must be fully qualified and RAs in South Africa

Participants were then selected according to the criteria highlighted above for the purpose of this study until a sample size of 20 research participants was reached. The manner in

which this was carried out is outlined below, and I will begin with the definition of sampling.

Sampling is the method used to select the units that will be investigated to extract, compare, and analyse data attained from those units (Babbie and Mouton, 2001). Simply put, the units would be the sample population comprising the individuals selected using the 'selection criterion' to be research participants for this specific research study (Bryman, 2011). Research participants are selected to provide rich, diverse, and informative data to help build and refine the theoretical insights related to the research question (Seale, 2011). Therefore, snowball and purposive sampling were used to determine the sample population to select the research participants for this dissertation (Naderifar, Goli and Ghaljaie, 2017). These two sampling methods were used to select the best-suited candidates to answer the research questions.

Snowball sampling can be defined as a non-probability sampling method where participants are taken from a finite population (Parker and Scott, 2019). It involves selecting research participants by starting with a select few individuals (Key informants for Cohorts A and B) who fit the selection criterion and then agree to be a part of the study (Parker and Scott, 2019). The agreeable participants are then asked to recommend other participants who also fit the selection criteria, and the selected individuals will then form part of the sample population (Parker and Scott, 2019).). This method of sample population selection was found to be best suited for this research study in particular as it allowed for the expansion of the geographical scope and would also allow for the identification of individuals that would have otherwise proven elusive (Naderifar, Goli and Ghaljaie, 2017). This meant that participants became much easier to access via recommendations from the key informants of this study (Cohorts A and B). Other participants also became much easier to access through the participants who had already been selected and interviewed. In its nature, snowball sampling allowed for the increment of the sample population, thus adding to the relativity of its representativeness and reliability (Naderifar, Goli and Ghaljaie, 2017).

On the other hand, purposive sampling is a participant selection based on a known characteristic (May, 2011). This was ideal for selecting the key informants for Cohorts A and B, which, in turn, linked the researcher to other potential participants. The key

informants that form the nucleus of Cohorts A and B were specifically selected because they fit the selection criteria for this study. May (2011:100) states that "numbers may be small and once again, the 'fit for purpose' defence may be developed." The key informants for both Cohorts A and B were selected purposively, as they fit the selection criteria (see above), making those eligible candidates for the purpose of the research study. Due to the population being slightly elusive due to their busy schedules, implementing purposive and snowball sampling and marrying them was the ideal means to select research participants and increase the opportunity to recruit more participants to complete the sample. Additionally, to ensure diversity, the research participants selected to be interviewed were male and female gender and of different ages. This was to increase the sample population's representativeness and ensure the relativity and reliability of the analysed data.

Furthermore, the diverse nature of the sample population also allowed for a comprehensive understanding of the different circumstances under which the audit professionals worked and how they received support. It also allowed the researcher to gauge how much informal support was available and to understand the different levels of participation in digitalisation across the two groups. All research participants selected were auditors involved in various parts of the audit process, using digital and other audit software packages and tools.

Data Collection

For the purpose of data collection, in-depth semi-structured interviews were used, guided by an in-depth semi-structured interview schedule (see Appendix A) with open-ended questions drawn from the themes that emerged from the literature chapter (see chapter two). The interview schedule allowed for the appropriate prompts to be used, creating an opportunity to "probe beyond the answers" given by the research participants, in turn, creating a dialogue between the researcher and the research participants rather than the whole process being just a question and answer session (May, 2011:134-135). The interviews were conducted via the video communications application called Zoom in order to stay within the COVID-19 regulations. To ensure that all participants were able

to attend the interview without any distractions and without feeling rushed, the interviews were done at a time that was convenient for them. The starting date for interviews for Cohort A were from December 2021 to February 2022, and the interviews for Cohort B were conducted from March 2022 to April 2022. The interviews were audio recorded and transcribed for data analysis purposes. Owing to the utilisation of this type of interview, implementing its methods and components allowed for the provision and attainment of rich and continuous data.

The Interview Process

The interviews were held virtually via the Zoom video communications application. This was to stay in line with the COVID-19 regulations and restrictions, ensuring the health and safety of the researcher and the research participants. It was also in line with ensuring that the interviews were held at the participants' convenience, in an environment that would create comfort for them and that they were also familiar with (McGrath, Palmgren and Liljedahl, 2018). Furthermore, the interviews were held at a convenient time for the research participants in order to work around the research participants' busy schedules. This created comfort around the interview setting, allowing the participants to feel free to speak without any hindrances or worries about time or anything else that might have been an issue. The duration of the interviews varied, lasting anything from 17 to 40 minutes (see Table 1 and Table 2 below). This was also dependent on the level of experience, knowledge, and expertise that the specific research participant had with the audit software packages or audit tools and the extent to which they affected their work life.

Table 1: Cohort A Research Participants

Participant Pseudonym	**Consent Form**	**Interview**
1. Cantu, N	X	**Date:** 20/01/2022 **Length:** 00:34:40
2. Chelsea, D	X	**Date:** 29/01/2022 **Length:** 00:17:23
3. Lebogang, P	X	**Date:** 28/01/2022

		Length: 00:26:15
4. Motloulela, S	X	**Date:** 17/12/2021 **Length:** 00:27:58
5. Polo, N	X	**Date:** 21/01/2022 **Length:** 00:20:04
6. Susie, M	X	**Date:** 20/12/2021 **Length:** 00:28:05
7. Trinity, T	X	**Date:** 02/02/2022 **Length:** 00:27:01
8. Tshipfisa, N	X	**Date:** 28/01/2022 **Length:** 00:23:36
9. Vhusi, M	X	**Date:** 16/12/2021 **Length:** 00:33:41
10. Mbali, S	X	**Date:** 31/01/2022 **Length:** 00:17:19

Table 1: Cohort A Research Participants 1

Table 2: Cohort B Research Participants

Participant Name	**Consent Form**	**Interview**
1. Annabelle, S 2. Clive, M	X X	**Date:** 11/04/2022 **Length:** 00:45:21
3. Clement, L	X	**Date:** 04/04/2022 **Length:** 00:36:53
4. Felicity, M	X	**Date:** 07/04/2022 **Written responses to interview questions**
5. Glen, M	X	**Date:** 23/03/2022 **Length:** 00:20:54
6. Kabelo, B	X	**Date:** 11/04/2022 **Length:** 00:31:51

7. Lebogang, M	X	**Date:** 13/04/2022 **Length:** 00:18:48
8. Tendani, M	X	**Date:** 24/03/2022 **Length:** 00:20:03
9. Thami, M	X	**Date:** 17/03/2022 **Length:** 00:25:47

Table 1: Cohort A Research Participants 2

With the written consent of the selected research participants, the researcher recorded and transcribed the interviews verbatim in the English language. The interviews did not occur without the participants sending their consent forms prior to the interview. Repeated words and words that were inaudible were excluded from the transcription. No filler words were used to fill in the inaudible parts of the interview, which aided the reliability of the information obtained and transcribed. Information irrelevant to the dissertation's subject was excluded to aid in the reliability and validity of the information obtained from the research participants.

The audio recordings from the interviews were then labelled accordingly to ensure confidentiality as stipulated in the research's ethical considerations. This ensured that the interviewee (the research participant) could not be identified. The recordings were later moved from the Zoom application and stored on Google Drive, which would only be accessible to the researcher and the researcher's supervisor. This was done to align with the ethical considerations, which require written approval before data collection commences.

Data Analysis

A qualitative TA method was utilised to analyse the data transcribed from the interviews (Clarke and Braun, 2017). Guided by the main research question, the data were analysed to identify the key factors needed to answer the research question. This allowed the data to be analysed and placed into the identified themes (see Table 3).

The themes were to aid in the understanding of the participant's thoughts, perceptions, and views (Clarke and Braun, 2017). The identified themes were then used as the categories for the data findings that were the outcome of the data analysis (see Table 3 below).

Table 3: Themes for Data Collected and Analysed

Research Participants	
Cohort A	Cohort B
Theme One: Contextualising the South African Audit Profession - Understanding professions - Understanding the South African audit profession o Challenges in the audit profession in South Africa - Tackling the technological challenges in auditing - The links between auditing and digitalisation - Digitalisation and its effects on the South African audit profession	

Theme Two: The Auditors' Perceptions of the Audit Process, Ensuring Audit Quality and the Implications on the Auditors' Work Life
- Factors influencing audit quality
- The impact of technology on audit quality
  o Research question responses in relation to audit quality
  o The changing nature of the audit profession
- How technology impacts the auditors' workload
- The technological learning curve in auditing
- Perception of IT audit tools in audit	

Theme Three: The Emotional Dimension of Work
- The human aspect of the audit profession
  o Employee participation and the concept of unlearning
- Support in the workplace – Leadership and training
- The future profile of the South African audit profession and the upskilling of RAs
Chapter Seven: Conclusion
  - Conclusion to the findings/empirical findings

Table 3: Themes for Data Collected and A 1

Given that this research study aimed to investigate what could be perceived as a subjective topic, exploring the nature of the auditor's work experiences and the impact their work environment has on them, the qualitative TA method was best suited to carry out the data analysis.

Ethical Considerations

Ethical principles and considerations should be at the core of any research process. For this research study to succeed, an ethically correct procedure was followed in order to ensure that the parties involved were not put in harm's way. Caution must be taken to ensure that every research process within this study was done correctly and ethically. Within a qualitative study, emphasis is placed on adhering to ethical considerations and principles. Therefore, the following ethical principles were considered and adhered to: informed consent and voluntary participation, privacy, confidentiality and anonymity, and beneficence – do not harm.

With permission from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria, the researcher obtained permission to conduct the research on 15 November 2021, with the following reference number: 20735121 (HUM010/0921) (see Appendix C).

For this dissertation, the ethical considerations of the Research Ethics Committee of the Faculty of Humanities and the Sociology Department at the University of Pretoria were considered and adhered to fully. As already mentioned, the ethical principles were followed when conducting this dissertation. Using the Individual Interview Information and Consent Sheet (see Appendix C), permission was sought from each research participant prior to the interview. This was to give the research participants clarity on what they would be signing up for and to ensure confidentiality for the information they provided during the interview. It was also to ensure that their participation would be strictly voluntary and that they would not be benefitting any incentives from participating in this research study.

Informed Consent and Voluntary Participation

Caution was taken to ensure that participants knew what they were consenting to. The participants were given full access to the information regarding the research study and their involvement. The researcher also informed the participants that they could contact her, or the other sources mentioned in the consent form if needed. Through individual interview information and consent forms (see Appendix C), the researcher notified the research participants of their rights regarding participating in the study. The participants were also reminded of their rights before the interview commenced and were asked if they would still like to continue with the interview. Additionally, the participants were encouraged to contact the researcher's supervisor, Prof Debby Bonnin, if they had any concerns. In addition, they were provided with the contact details for the South African Depression and Anxiety Group (SADAG) if they needed counselling.

Individual interview information and informed consent forms were given to the research participants prior to the interviews, providing detailed information on what would be required of them in the interview, and to obtain well-informed voluntary consent. This was in addition to having already informed the research participants of what would be needed from them through verbal communication in a prior engagement before the individual interview and informed consent forms were returned. The individual interview information and informed consent form detailed that the research participants were to

participate at their own will after having read the terms of the consent form and that there were no incentives or any remuneration given for being a research participant. Research participants were also informed that they could use a pseudonym or an alias if they did not feel comfortable using their own name. They could pass on questions they did not feel comfortable responding to and were not required to disclose the names of their designated workplaces.

Furthermore, the research participants were also notified of their right to withdraw from the research study at any time. They were also informed that the interview would be audio-recorded and that the researcher would take notes if a research participant did not want to be recorded. However, all the research participants did not have any issues with being audio-recorded and gave their written consent for the interview to be recorded. All consent forms were written in English, but the research participants could request that the consent forms be translated into a language of their preference. The researcher also explained that the information provided during the interviews would be used for academic purposes and nothing else.

The research participants who formed part of the research study were not coerced in any shape or form to be part of this research study and gave written consent to be a part of the study.

Privacy

During the data collection preceding the interviews, participants were informed that their personal information and identities would be kept safe. The research participants' information is stored in a Google Drive where only the relevant staff members of the Sociology Department at the University of Pretoria can access it, namely, Professor Debby Bonnin (the supervisor) and Noluthando Phasha (the researcher). The information obtained from the research participants is in safekeeping and will not be shared with any third parties. The research participants were made aware that they could use a pseudonym or an alias to protect their identities if they wished to; as such, the research participants' identities were captured and recorded in a manner that suited them under which they were

comfortable. Thus, the research participants who wished to conceal their identities were granted that request.

Since the interviews took place via a video communications application, Zoom, the study's participants had the option to join with or without video; however, only the interview audio recording was captured to ensure that the participants' privacy was adhered to and maintained. However, one participant joined via video; thus, only the audio of this interview was recorded. The research participant was from the second cohort (Cohort B). This suggests that 19 research participants joined without video, and one of the 20 participants joined the interview with video (only the audio of all the interviews was recorded). The interview audio recordings were not shared with other parties or entities to ensure and maintain the research participant's right to privacy and confidentiality, which is in line with respecting and adhering to the ethical considerations of a qualitative research study.

Confidentiality and Anonymity

The research participants' information was respected and protected. The information collected from the research participants was saved and stored using details they were comfortable with. In line with using pseudo identities, the research participants' real identities were kept private. They were not a requirement while conducting the data collection for this dissertation. In the place of 'name' on the individual interview information and informed consent form (Appendix C), the research participants were made aware verbally and on the consent form that they could use a pseudonym or an alias of their choice. Although not shared on Google Drive, the participants' contact details were required to contact them after the interviews and follow-up if necessary. The participants' details will remain private and will not be shared with anyone other than the researcher.

Beneficence – Do not harm

The main objective in conducting any research study is that this ethical principle in the research process involves creating and developing a professional relationship with the

participants to avoid blurred lines (Beauchamp and Childress, 2001). It created a professional mandate to conduct the research process appropriately, ensuring no one was harmed in any way, shape, or form in the data collection process. The ethical considerations or principles mentioned were adhered to throughout this research study and the data collection stages. The researcher ensured that the study posed no harm to the research participants physically, psychologically, mentally or emotionally by taking the necessary steps to minimise any risk that may have been anticipated.

The participants were provided with information and details of the relevant entities in case any risks or concerns resulted from the study.

Limitations

When conducting any research study, one may encounter challenges and limitations. As such, there is a need to address the challenges and limitations presented by the study methods.

The interviews with the selected participants were conducted virtually via Zoom, a video communications application. Some participants could not join the meeting; thus, they requested that the interview schedule and consent form be emailed to them, which delayed the interview process as they took quite a long time to respond. One example of the above occurring was that a potential research participant had expressed that they could not participate in the interview, thus requesting that the interview schedule be emailed to them so they could respond to the research questions in writing. As per their request, the interview schedule and consent form were mailed to them. However, they did not respond despite countless follow-up emails to establish if they were still interested in participating in the study and to ask when they would return the documents (the informed consent form and the interview schedule). Additionally, one other participant requested the interview be sent to them via email due to being unable to make time for a physical interview. The request was accepted, the interview schedule was sent via email, and they returned a document with all the questions answered, although the documents were received after the agreed date.

Deadlines were set and agreed upon by both the researcher and research participants. Interviews were set to occur with 20 research participants: 10 for Cohort A and 10 for Cohort B. Both cohorts began with one key informant. The key informants were meant to propel the researcher to other potential participants; thus, a referral obtained nine additional participants for Cohort A. However, only eight additional participants were obtained for Cohort B instead of the intended nine. This was due to one of the research participants pulling out of the study as they did not want to be a part of it anymore (the said participant was excluded as they did not return the signed consent form and interview schedule). The researcher found a replacement, and 20 participants were still recruited for the study. Another potential research participant expressed that they could not partake in the virtual interview via Zoom and requested that the interview schedule and consent form be emailed to them for completion. As per their request, the interview schedule and consent form were emailed. The participant did not respond despite countless follow-up emails and texts on WhatsApp, a messaging platform, to establish if they were still interested in participating in the study and when they would return the documents. Another issue experienced with recruiting participants was having potential participants drop out or not want to be a part of the study because they had either signed a Non-Disclosure Agreement (NDA) with the company they work for or did not feel comfortable being part of the study. The reasons for discomfort included being uncomfortable with being recorded and not wanting the information they give to be in conflict with their job. To counter this, the researcher explained that only the interview audio would be recorded and that their right to privacy would be maintained. Furthermore, the potential participant was assured that only the interview recording would be saved, not the video (optional), and that it would be saved under a pseudonym of their choice.

Conclusion

This chapter outlined the research methodology followed while conducting this research study. The methods chosen to conduct this study were suitable for getting rich, in-depth data to answer the main question for the investigated subject matter. Furthermore, it highlights the limitations and challenges experienced during the research study and how they were resolved. Utilising a qualitative methodology allowed for an in-depth

investigation into the changing nature of the South African audit profession, what this implies for the auditors' work, and the manner in which they experience it.

It is essential to note that the study was localised. All participants selected for this research study were South African-based and South African citizens. This presents opportunities for further research in other countries, increasing the generalisability of the study and its validity. Notwithstanding the challenges and limitations encountered while carrying out the methodology chosen for this research study, the methods used were beneficial to obtain data that would be rich and continuous. Furthermore, the research methods aided in conducting the investigation part of this study in a manner that was efficient and effective for the overall purpose of this dissertation.

The information gathered and analysed during all the methods stages will be discussed next in the empirical/findings chapters.

CHAPTER FOUR – THE SOUTH AFRICAN AUDIT PROFESSION

Introduction

This chapter discusses how the South African Audit Profession has been influenced by the introduction of AI systems, such as audit software packages and audit tools. The discussion delves into the benefits and challenges of digitalisation for the South African Audit Profession and the implications thereof on the auditors' workplace and the auditor.

The focus of this chapter is to address the first sub-question set out in the introduction, "What new technologies (audit software packages) have been introduced into South African audit firms, and how have these affected the audit profession?" In answering this question, the following four areas will be highlighted, namely:

1. Understanding professions
2. The South African Audit Profession
3. What new technologies have been recently introduced/updated or upgraded to the South African Audit Profession?
4. How have these new technologies disrupted, influenced and shaped the South African Audit Profession?

To answer the above questions, firstly, I will briefly situate the 'professions' within a conceptual framework; secondly, the Audit Profession in South Africa will be discussed with reference to the relevant legislation and regulatory frameworks. Thirdly, using secondary data, I will consider the new technologies, their updates, and add-ons that have been introduced and integrated into the work and workplace of the auditor.

Understanding Professions

Several sociological perspectives allow us to look at professions. Examining the audit profession through a sociological lens provides a rich and in-depth understanding of its dynamics, especially in the context of technological advancements. Sociological

perspectives drawing from the research field 'sociology of professions' shed light on the way in which social and institutional factors influence the development, structure, and practices of professions like auditing. Sociological approaches to professions emphasise the social processes and interactions that shape professional identity, knowledge, and power. Cruess and Cruess (2016:265) argue that professions are a social contract based on certain social constructs, such as the frequency of a self-regulating monopoly over specialised knowledge based on the understanding that they deliver certain services. From this perspective, the audit profession is a complex social institution (Cruess and Cruess, 2016).

A report by the International Audit and Assurance Standards Board (IAASB) (2014) highlighted that the introduction of new technologies in auditing has challenged traditional professional boundaries and frameworks. The boundaries between auditors and non-auditors blur with the rise of advanced audit software packages and audit tools. Data scientists, IT specialists, and auditors collaborate, challenging the auditors' traditional monopoly over specialised knowledge. The afore-mentioned collaboration reshapes professional identities, challenges established hierarchies, and market restrictions to the profession, a main theme of Neo-Weberianism (Saks and Adams, 2019). Thus, audit professionals in their different work capacities should associate or link to their workplace responsibilities/audit duties through a division of the kind of work they do and what they specialise in. This becomes particularly significant when we examine how technology influences changes in this dynamic.

The sociology of professions allows us to critically examine the impact of technology on professional autonomy (Hirschhorn and Farquhar, 1985). Technology integration might enhance efficiency, but it also raises questions about who controls the technological tools within the South African Audit Profession. Furthermore, viewing the audit profession from a sociological perspective allows us to consider how technology influences the socialisation processes and professional culture within the audit profession. As new auditors enter the workforce, they are socialised into a professional culture shaped by technology (Nienaber, 2022). This culture includes norms, values, and practices related to the use of audit software packages and audit tools. Understanding this socialisation process is vital for understanding how technology becomes an integral part of the professional identity of the auditor.

The Neo-Weberian approach, championed by scholars like Saks (2012), offers valuable insights into understanding the audit profession in South Africa and its evolving dynamics in the face of technological advancements. This approach, rooted in the ideas of Max Weber, emphasises the need to define a profession by acknowledging that professionalism is not always black and white or something that "follows a linear process" when it comes to the skills and expertise that a professional may possess (Saks, 2012:5). Moreover, it emphasises the exclusionary or licensed approach to professions in the marketplace (Saks, 2010). In terms of the South African Audit Profession, this would manifest in the form of licensing fees, rigorous examinations, accreditation of degree programmes, and the number of years required to qualify as a Chartered Accountant in order to qualify, register, and practice as an RA.

In the context of South African audit professions, the Neo-Weberian perspective allows for a nuanced analysis of the profession's transformation to digitalisation and automation. This is because the Neo-Weberian approach acknowledges that more goes into defining a profession than just the black-and-white definition of a profession. Furthermore, it illustrates that a profession can take on multiple aspects, allowing for a combination of skills and expertise (Saks, 2012). With the integration of advanced technologies, auditors have experienced a shift in their roles from traditional manual tasks to more specialised, knowledge-based functions. This rationalisation has led to the standardisation of audit processes, increased efficiency, and a greater emphasis on technical expertise.

Noordegraaf's (2007) work on understanding professions in the contemporary context is highly relevant. As socio-economic conditions change, the traditional organisational structures of professions are being challenged. The introduction and integration of AI systems, such as audit software and tools, are implementing changes to the auditor's work role. This then prompts a transformation to the manner in which auditors would perform their audit duties. The influx of technology has blurred traditional professional boundaries, enabling auditors to collaborate across disciplines and integrate different skill sets. Koreff, Baudot and Sutton's (2023) perspective provides a lens through which we can analyse the evolving nature of professional boundaries within the audit profession, particularly concerning the integration of technological expertise. By allowing audit companies to distribute certain audit duties to other audit professionals at different levels

within the company, we begin to see this integration of technological and theoretical expertise.

In summary, by applying the Neo-Weberian approach, along with insights from scholars like Koreff *et al*. (2023), a comprehensive understanding of the impact of technology on the South African Audit Profession emerges. This multifaceted analysis allows for a deep exploration of the rationalisation, regulation, and changing organisational dynamics within the profession, providing valuable insights for policymakers, practitioners, and scholars alike. It underscores the need for a holistic approach that considers historical contexts, regulatory frameworks, and changing socio-economic conditions to grasp the complexities of the modern audit profession in South Africa and beyond.

The South African Audit Profession

The audit profession plays an important role in ensuring the integrity and transparency of the financial information provided by companies. Audits are conducted by Registered Auditors, who "would typically audit the accounting systems, procedures and financial statements of a company, and would evaluate the way in which the company manages corporate funding and financial risk. An auditor would also ensure that a company complies with all the legal requirements of its business and that tax payments are correct and in line with tax legislation and requirements" (IRBA, n.d.a).

Auditing is a legally regulated profession, and the designation of 'auditor' can only be used by those who are accredited by the regulatory body.

In South Africa, the audit profession is regulated by the Independent Regulatory Board for Auditors (IRBA). The IRBA was established in terms of section three of the Auditing Profession Act No. 26 of 2005, which came into effect on 1 April 2006. This legislation was recently amended by the Auditing Profession Amendment Act No. 5 of 2021. Within the powers granted by the relevant legislation, the IRBA sets auditing and ethical standards, sets the framework for the education and training of auditors, is responsible for the registration and accreditation of auditors, monitors compliance with professional standards, investigates and disciplines those found guilty of being in breach of auditing

and ethical obligations, and works with stakeholders to ensure accountability and public confidence in the profession (IRBA, n.d.b.).

For an individual to qualify as an RA, one must register for a Bachelor of Accounting Science (BCompt) with an accounting or finance major degree. Thereafter, the aspirant auditor should complete an honours degree, which is known as a Certificate in the Theory of Accounting. These degrees must be accredited by the SAICA. Upon completing the academic requirements, they are eligible to write the 'Initial Test of Competence' (ITC), which is the first board exam, and begin their professional training or articles. At the end of the designated period of articles, the candidate writes their second board exam, 'Assessment of Professional Competence' (APC). These exams are set by the SAICA. Successful candidates are now recognised as professional accountants – Chartered Accountants CA(SA), and if they wish, they can now register for the IRBA's Audit Development Programme (ADP). At the end of this work experience programme, undertaken in an audit firm, and after having demonstrated their professional competence through the successful submission of a 'Portfolio of Evidence,' the registered candidate auditor would be eligible to register as an RA (IRBA, n.d.c).

In the South African context, audits are important to various stakeholders due to the following benefits they provide:

- Trust and Credibility: Audited financial statements enhance the credibility of a company's financial information, instilling confidence among shareholders, investors, the government, the public, and other stakeholders.
- Compliance: Audits ensure that businesses comply with relevant laws and regulations, promoting financial transparency and accountability. In South Africa, various laws and regulations govern different industries. As part of their mandate, auditors must ensure compliance with the South African Revenue Service (SARS), industry-specific guidelines, best practices, and any other relevant regulation.
- Risk Management: Auditors conduct risk management for companies by considering the following aspects.

- Risk assessment – Auditors must understand the industry and the company's internal controls. The climate of risk includes political and economic risks and industry-related challenges.
- Determining materiality – Auditors determine the materiality thresholds that help determine audit strategy and focus areas. This aspect is crucial in managing the risk of not detecting material misstatements.
- Internal control assessment – This aspect helps auditors understand deficiencies in internal control and assist their clients in calibrating their control systems accordingly.
- Fraud risk assessment – This assessment helps auditors design audit procedures to detect potential fraud activities. Factors such as internal control weakness, management integrity, and industry practices are taken into consideration.
- Professional scepticism – South African auditors apply professional scepticism, which involves a critical assessment of facts and a questioning mindset when conducting engagements and dealing with clients. This allows auditors to remain vigilant and avoid overlooking potential areas of concern (KPMG, 2021, a).

Challenges in the Audit Profession in South Africa

The audit profession in South Africa faces several challenges that impact its effectiveness, credibility, and general functioning. Some of the significant challenges include:

- Regulatory Changes

Adapting to evolving regulatory standards and international auditing practices can pose challenges for auditors. Complex regulations and regulatory oversight make it increasingly difficult to keep up with the rapidly evolving and complex regulatory landscape. This is not just the case domestically but internationally, especially when a large number of multinational organisations operate in the country and the region (many of which are headquartered in South Africa) (Kuit, 2006).

- Ethical Concerns

Ensuring ethical conduct and independence is crucial, considering the potential conflicts of interest that might arise. Maintaining independence and objectivity while dealing with clients, especially in cases where auditors provide non-audit services to the same clients.

- Technological Advancements

Technological advancements like data analytics and AI are necessary to enhance audit effectiveness (Babayeva and Manousaridis, 2020).

- Professional Standards

Ensuring high-quality audits in adherence to professional standards, especially for smaller audit firms with limited resources. Attracting and retaining skilled auditors, especially in the face of increasing demand and competition from other sectors (Kuit, 2006).

- Technology and Data Security

Integrating advanced technologies like data analytics and AI into audit processes requires significant training and infrastructure investments. Ensuring the security and confidentiality of sensitive client data in the age of cyber threats and data breaches (Kuit, 2006).

- Public Perception

Maintaining public trust in the wake of recent corporate scandals and audit failures in South Africa and around the world has been a challenge for the profession (Kuit, 2006).

- Diversity and Inclusion

Promoting diversity within the profession to ensure a broader range of perspectives and experiences continues to be an ongoing challenge (Griffith and Holmstrom, 2022). This also must be taken in the context of the high levels of inequality and high youth unemployment in South Africa.

Understanding the challenges within the external audit profession in South Africa is essential for tailoring technological solutions to address specific needs effectively. By recognising and addressing these challenges, the impact of technology on the South

African Audit Profession can be maximised, leading to more efficient, accurate, and secure audit processes in the country (Pareen and Fritz, 2021).

Tackling the Technological Challenges in Auditing

For as long as humanity has existed, there have been many improvements and developments in the technology we use (Adiloglu and Gungor, 2019). The same technological developments and improvements can be seen to be infiltrating and changing the South African audit landscape. With this transformation in motion, it has become evident that technology is and continues to influence modern society. These technologies can be said to be innovations that have aided in creating opportunities for many workplaces and their professionals. Audit firms must ensure that they understand the implications of these innovations as they occur. The increasing influence of globalisation on the South African economy has meant that many organisations, especially those that are multinational and international in nature, have had to align their financial reporting, controlling and management structures with international standards. According to the Government Gazette (45389:5), the Auditing Profession Act Amendments proclamation in April 2021 "has further strengthened the IRBA's independence and powers to deliver a powerful mandate." This has allowed the IRBA's regulatory philosophy and actions to enhance its effectiveness as an internationally recognised audit regulator, which is best suited to keep to the set ethics and standards that allow it to serve the interests of the investing public.

> External auditors remain a key stakeholder in protecting the interests of the investing public. Worldwide, regulators, investors, and stakeholders have a broad consensus that further interventions are necessary to enhance the financial reporting and governance ecosystem, including the auditing profession, and respond to investor risks and needs (Government Gazette, 45389:5).

As in South Africa, most nation-states have national bodies that regulate the profession within their national borders (e.g., the Financial Reporting Council in the United Kingdom, the Auditing and Assurance Standards Board in Australia, and the Higher

Council for Statutory Audits in France, etc.). However, the more recent global dominance of professional service firms, particularly in auditing and other professions like law, has changed the landscape of contemporary professions (Faulconbridge and Muzio, 2012:143). To enable global standards (and compliance), bodies like the International Federation of Accountants (IFAC) and the International Auditing and Assurance Standards Board (IAASB) create international standards for auditing as well as quality control, review, and other related services. South African regulatory authorities in auditing are affiliated with these global bodies and have adopted the international standards set by these bodies.

> A more competitive business climate means that client and regulators' demands may likely change in the future. Auditors are increasingly expected to become technology experts as it is seen as a gateway to cutting costs, improving the client experience and bridging the gap in communication between different stakeholders who are sometimes in vastly disparate geographical locations and time zones (Barac *et al*., 2016).

As the industry has become more competitive, failure by an audit firm to offer superior service and up-to-date solutions that are abreast with technology can result in a loss of clients and reputational damage that can be very difficult to recover from (Barac *et al*, 2016). All this must be achieved while operating in line with the auditing standards and ethics set out in the Auditing Profession Act (Act No. 26 of 2005) IRBA, 2018). Auditors and their firms alike need to ensure that they stay within the prescribed "standards of professional competence, ethics and conduct of registered auditors" and the prescribed auditing standards (IRBA, 2018:2). To have a clear understanding of the evolving capacity of the South African Audit Profession, we must know more about the digital technologies used within the profession, how these technologies have influenced and possibly changed the profession, and what the implications have been on the auditors' work (work life and work experience), as well as their workplace in general.

With the development of technology over the years, the digitalisation and automation of many business operations have become a reality for most. Technology development is one reason why the audit profession has been pushed towards continuously using, updating, and upgrading the technology used in the audit process. It is not unknown that

we live in a very industrial society, where our society can be characterised by the vast use of technology, among other things. Likewise, the South African Audit Profession is no stranger to this phenomenon, as the adoption of technology in the profession is prevalent. Considering the above, it is no surprise that those within the profession, especially auditors, would be expected to familiarise themselves with any new technologies or upgrades/updates of the technology already in use within their designated audit firm. It cannot be disputed that the introduction of new digital technologies or the upgrade/update of the old ones impacts and affects the structure of things within the auditors' workplace. This affects the auditors' way of working during their day-to-day operations and changes the way the auditor might experience their work. Most of the auditors interviewed agree that their day-to-day operations and how they experience their work is affected. The auditors state in their responses that the audit software packages and tools they use are beneficial to them, that they have significantly reduced the time spent on audit tasks, in their function taking care of all the tedious tasks that are usually a lot of admin, allowing them to focus on the more complex tasks.

> *"The audit work does the administrative work so that we can focus much on the core functions and the core business of the engagement. Like, when I refer to administration. So, let's say you have to do certain things repetitively, so, it can do them at once, then it saves you time, and its efficient and, it opens other opportunities in terms of like… Let's say in audit mostly what it concerns the auditors is the risk. So, if you have more time, you have more time to focus on other emerging risks."* (Participant Interview, Motloulela from Cohort A, 16/12/2021).

This aligns with the stance that Lombardi, Bloch and Vasarhelyi (2014) and Wagner (2016) take in their studies, as they take into consideration that the audit profession is in the process of change from using manual methods to conduct audits to implementing the digitalisation and automation of the audit process. This brings changes that influence and shape the South African audit profession. Furthermore, existing technologies are being upgraded or updated.

Global firms, such as the big four accounting/audit firms (KPMG, PricewaterhouseCoopers, Deloitte and Ernst & Young) in South Africa, have led the way

in using and developing AI audit tools. Partnering with global tech firms like IBM, they made substantial investments in technological advances (Kokina and Davenport, 2017:116). Those interviewed for this study indicated that smaller local firms followed, often with off-the-shelf AI tools.

Ethical Challenges of Digitalisation and Auditing

The digitalisation of auditing processes in South Africa, as in many parts of the world, has presented various ethical challenges. These challenges stem from the increased reliance on technology, the handling of high volumes of data, and potential ethical dilemmas that arise in this context (Nienaber, 2022). It is evident that a decline in audit standards impacts its standing in global competitiveness, which has been the case in South Africa (Harber, 2018).

The rate of change in technological developments has sparked curiosity about adequate testing and assessment of some of the software before it is released to the market (Nienaber, 2022). This also puts audit firms in a quandary as to whether to take a wait-and-see approach to certain developments or to become early adopters and bear the risks and training costs associated with this.

Listed and discussed below are some of the main ethical challenges faced by auditors in South Africa concerning digitalisation and auditing:

1. Data Security and Privacy

Safeguarding against data breaches means that firms must invest in robust cybersecurity measures to prevent unauthorised access, which could compromise sensitive client information.

The Protection of Personal Information Act (POPIA) of 2013 means that firms must adhere to laws and ethical standards concerning the collection, storage, and use of personal and financial data (Chigada, 2021).

2. Independence and Objectivity

Due to various factors such as viability concerns, the cost of adopting new technology and related training, and a need to ensure they continue to be relevant to their clients, audit firms continue to offer several non-audit services: Providing non-audit services, such as IT consulting, to audit clients can create conflicts of interest, potentially compromising independence and objectivity. The challenge of maintaining independence when dealing with technology vendors whose products or services are being audited also presents a growing concern (Marx and Harber, 2020).

3. Use of Data Analytics and AI

The interpretation of results obtained from technological tools raises ethical challenges related to how auditors interpret and use insights obtained from data analytics to draw conclusions and make recommendations. There is a possibility of bias, and there may be a need to ensure that the algorithms used in data analytics and AI tools are free from bias, particularly in areas such as hiring, lending, and decision-making, where audits might be conducted.

4. Professional Scepticism

Overreliance on technology may hinder employees from balancing between utilising advanced auditing tools and maintaining human judgment and professional scepticism, which is crucial for detecting fraud or intentional misstatements (Marx and Harber, 2020).

There is a need to promote ethical decision-making when technology suggests irregularities. A new space auditor must determine if their response to such situations constitutes a rational and ethical response.

5. Regulatory Compliance

Given the highly regulated environment in South Africa, auditors need to stay ahead of evolving regulations and ensure that digital audit processes align with legal and ethical standards (IRBA, 2018).

6. Cybersecurity

There is a need to align with client cybersecurity objectives to minimise client vulnerability. Identifying and addressing cybersecurity vulnerabilities in clients' systems, as audits, might unearth weaknesses that could be exploited. Additionally, firms must

ensure everything is done to protect audit-related data and communication channels from cyber threats and maintain the confidentiality and integrity of the audit process (Chigada, 2021).

Addressing these ethical challenges requires a combination of strict adherence to ethical guidelines, continuous professional education, transparent communication, and a commitment to upholding the integrity of the audit profession. In many instances, industry collaboration with clients and other key stakeholders will be needed to establish and enforce ethical standards relevant to the digital ecosystem (Kanyane, 2004).

The Links between Digitalisation and Auditing

To fully understand the link between auditing and digitalisation, we need to understand their impact on the profession and what they mean for the auditor's work.

To do an audit, there needs to be information that is verifiable and done according to the audit standards, which the auditor can then examine, analyse, and compile audit statements (IRBA, 2018). The role of an auditor can be understood to be to provide assurance services for their client company's owners and stakeholders by ensuring that their financial statements are accurate and unbiased (Myoli, 2022). This must be done in a manner that is just and within the audit standards and regulations set by the regulators of the profession in South Africa. Therefore, as a profession that prides itself in executing operations that ensure that financial statements match auditing standards accurately, it is important that audit firms employ strategies that will drive operational executions that are precise and as concise as possible.

The above clearly indicates that the South African Audit Profession, auditors, and their workplaces are influenced and transformed by introducing new technology and its development (AI systems). This can raise concerns and uncertainty for the profession and those within it. The digital technology (audit software package and audit tools) used in the audit profession has and continues to significantly impact the profession by changing the national landscape, skills, and profile of auditing (Moffit and Vasarhelyi, 2013). The gradual but significant development and improvement of digital technologies are thus widely adopted by many audit firms in financial reporting and have influenced and

changed how they run their day-to-day operations (Karlsen and Wallberg, 2017). This has also changed how their clients manage their operations (Myoli, 2022). Certain drives, such as paperless office initiatives, have meant that actions such as authorisation of financial transactions can be done remotely and with an electronic signature. Therefore, audit trails would have to be verified electronically, which, it may be argued, can increase the risk of fraud, but it is necessary for smooth workflow. Hence, this has pushed South African auditors to adapt and align their operations to their client's needs and offer a broader range of skills and protocols when handling client engagements (Myoli, 2022).

Some of the new types of technologies that are gaining traction in the South African Audit Profession are as follows:

- Data Analytics: South African audit firms are increasingly using data analytics and AI tools to process and analyse large volumes of financial data more efficiently. When reviewing financial statements, these technologies help auditors identify potential risks, anomalies, and trends (Van Loggerenberg, 2020). Examples of the auditing software/audit tools used by auditors would be CaseWare IDEA/IDEA[3] and Excel.[4]

- Blockchain: Blockchain technology is explored for its qualities to enhance the transparency and traceability of financial transactions. Some companies use blockchain for supply chain audits to verify the integrity of financial data (KPMG, 2021b). This is done through auditing software/audit tools such as TeamMate[5] and the MEG Tool.[6]

- Cloud Computing: Cloud-based auditing software is widely adopted. This allows auditors and their clients to access data and tools remotely (van der Merwe and Kotzé, 2011).

[3] IDEA/CaseWare IDEA – a data analysis software that aids in accelerated data analytics and provides a user-friendly experience for the auditor (CaseWare.com, n.d.a).
[4] Microsoft Excel/Excel – an online spreadsheet that aids in the analysing, storing and exploring of data (Microsoft.com, n.d.a).
[5] TeamMate – an audit software that helps with data analysis. It improves visibility, efficiency and consistency of audits across the department (Wolterskluwer.com, n.d.a).
[6] MEG Tool – an intuitive, cloud-based digital quality management tool (megit.com, n.d.a).

- Automation and Robotic Process Automation (RPA): Automation tools and RPA are used to streamline routine audit tasks, such as data entry and reconciliation of accounts receivable and accounts payable. This allows auditors to focus on higher-value activities, such as risk assessment and analysis (Moffit *et al.*, 2018).
- Digital Documentation and Electronic Signatures: Many audit firms were transitioning to digital documentation and electronic signatures for audit reports and other critical documents, reducing paperwork and improving efficiency (Moffit *et al.*, 2018).
- Collaboration and Communication Tools: Collaboration platforms and communication tools were used to facilitate real-time communication and document sharing between audit teams and clients (e.g., TeamMate), especially given the remote work trends accelerated by the COVID-19 pandemic (Moffit *et al.*, 2018).
- Continuous Auditing and Monitoring: Continuous auditing tools and techniques were gaining popularity, allowing auditors to monitor financial transactions and controls continuously rather than relying solely on periodic audits (Moffit *et al.*, 2018).
- Regtech: Regulatory technology (Regtech) solutions were adopted to help auditors comply with evolving regulatory requirements, such as financial reporting standards and data protection regulations (Moffit *et al.*, 2018).
- AI in Fraud Detection: AI-based solutions were used to detect and prevent fraud by analysing transaction patterns and identifying unusual or suspicious activities (Moffit *et al.*, 2018).
- Machine Learning for Predictive Analytics: Machine learning algorithms were employed for predictive analytics, helping auditors forecast financial trends and assess future risks. This further indicates the impact and influence that digitalisation has on the audit profession. The technologies listed above indicate the extent of the infiltration of digitalisation into the audit profession (Moffit *et al.*, 2018).

Digitalisation and its Effects on the South African Audit Profession

According to Gartner (2020), digitalisation is the introduction and use of digital technologies, such as audit software packages and audit tools, that can improve business processes and generate new revenue for audit firms. Digitalisation has significantly impacted professions worldwide, including the audit profession in South Africa. This transformation has brought about profound changes in audit methodologies, processes, and professional roles. This section explores the multifaceted effects of digitalisation on the South African Audit Profession, examining its influence on efficiency, accuracy, professional roles, ethical considerations, and the overall landscape of auditing practices.

One of the most immediate effects of digitalisation on the South African Audit Profession is the substantial increase in efficiency and accuracy. Advanced audit software packages, data analytics tools, and AI have enabled auditors to automate repetitive tasks, process vast amounts of data, and swiftly identify patterns and anomalies. This enhanced efficiency expedites the audit process and improves the accuracy of financial assessments and risk analysis. This highlights just how much digitalisation has reshaped the roles and skill sets required of auditors. Auditors have had to expand their outlook and experience to include fields such as data analysis, technology expertise, and strategy. The ability to interpret complex data sets and leverage sophisticated software tools has become as crucial as traditional auditing knowledge. This evolution demands continuous upskilling and adaptability from auditors to meet the demands of the digital age (Dubihlela and Gwaka, 2020).

While digitalisation offers numerous advantages, it raises data security and integrity concerns. The digitalisation of audit processes has introduced ethical considerations related to the responsible use of technology (Munoko *et al.*, 2020). Auditors must navigate issues such as client confidentiality, data privacy, and the ethical implications of using AI in decision-making processes. Maintaining professional integrity in the face of these challenges is paramount, necessitating the establishment of ethical guidelines and industry standards tailored to the digital era. Digitalisation has transformed the dynamics of client-auditor relationships. Real-time collaboration through online platforms and secure communication channels has become the norm. Clients expect auditors to provide actionable insights derived from advanced data analysis, driving auditors to offer value-

added services beyond traditional financial audits. This shift requires auditors to possess excellent communication skills and the ability to translate technical findings into meaningful business recommendations (Munoko *et al.*, 2020).

Digitalisation has ushered in a new era for the South African Audit Profession, fundamentally altering how audits are conducted, professionals are skilled, and client relationships are managed. Embracing digital technologies offers immense opportunities for efficiency, accuracy, and value-added services. The rate at which the digitisation of the audit profession has picked up momentum in recent years has challenged many existing business models in South African audit firms (Dubihlela and Gwaka, 2020). However, auditors must navigate challenges related to data security, ethical dilemmas, and evolving professional roles (Nienaber, 2022).

Conclusion

In conclusion, technological advancements have greatly impacted the audit profession. These technologies have disrupted the role and perception of auditors and will continue to do so in the foreseeable future. The introduction and use of new technologies play a part in influencing and shaping the South African Audit Profession. In their nature, prompting changes in how the audit is performed presents both challenges and benefits for the profession and its stakeholders.

Examining auditing through sociological perspectives offers a holistic understanding of the changes in the profession's dynamics. The Neo-Weberian lens sheds light on the erosion of the profession's exclusivity and the potential of smaller audit firms to possibly compete with their larger and more established rivals. This has seen the perception of auditors by clients and other stakeholders transform into tech-savvy, knowledge-driven professionals. Technology has resulted in an erosion of barriers between auditors and other stakeholders. As auditing continues in the digital age, professionals, policymakers, and scholars must consider these sociological perspectives. By doing so, they can navigate the challenges posed by technology, uphold ethical standards, and foster a profession that is not only technically proficient, but also socially aware and adaptive to the ever-changing demands of the contemporary world.

Traditionally, the South African audit profession has been characterised by rigorous standards, meticulous procedures, and a strong emphasis on accuracy and reliability. However, with the digital revolution, auditors are no longer solely reliant on manual methods; instead, they are embracing innovative technologies to enhance efficiency and effectiveness.

In recent years, there has been a surge in the adoption of cutting-edge audit software packages within South African audit firms. These technologies encompass advanced data analytics, AI, machine learning, and blockchain applications. Audit software packages such as data visualisation tools, predictive analytics, and automated audit workflows have become integral to the audit process. These tools empower auditors to analyse large volumes of data, identify patterns, and detect anomalies with unprecedented speed and accuracy.

The impact of these technologies on the South African audit profession has been profound. They have disrupted traditional audit methodologies by automating repetitive tasks, allowing auditors to focus on more strategic and analytical aspects of their work. Real-time data analysis and predictive modelling have enhanced auditors' ability to assess risks, detect fraud, and provide valuable insights to clients. Moreover, collaboration between auditors and clients has become seamless through cloud-based platforms, fostering enhanced communication and transparency.

Despite these advancements, challenges have emerged, including the need for auditors to acquire new skill sets and adapt to evolving regulatory frameworks. Additionally, concerns related to data security, the ethical implications of AI, and the potential for technology-induced biases require careful consideration.

Integrating new technologies into South African audit firms has revolutionised the profession, making audits more efficient, insightful, and adaptive to the complexities of the modern business landscape. As auditors continue to navigate this technological landscape, it is crucial for them to strike a balance between leveraging these innovations and upholding the ethical standards and integrity that underpin the audit profession.

In the face of ongoing technological advancements, continuous learning, adaptability, and ethical consciousness will be pivotal for auditors in South Africa to harness the full

potential of these technologies while upholding the principles that define their profession. Chapter five discusses the impact of audit software systems/software on the South African auditors' work life. The rise and increased use of technologies present opportunities to many audit firms but a new level of expectation for the auditor. In this context, it is significant that the auditors' experience be captured.

CHAPTER FIVE – THE AUDIT PROCESS, ENSURING AUDIT QUALITY AND THE IMPLICATIONS ON THE AUDITORS' WORKLIFE

Introduction

This chapter investigates the factors influencing the South African auditors' work life, particularly the factors influencing audit quality and the impact of new audit software and tools on these variables. Furthermore, this chapter highlights the research participants' perception of their workload based on the adoption of new technologies, such as audit software and tools, and the learning curve experienced by the auditors when using the new technology. This ultimately translates into a skills training gap and how relevant stakeholders seem to be tackling this issue. More specifically, this chapter explores the auditors' experiences and perceptions in the wake of IT audit tools (audit software/tools) and how they have transformed the audit process, thereby bringing about audit quality.

This chapter aims to answer the research questions by exploring the following questions raised in the introduction:

- How has the introduction and use of audit software and tools impacted the South African auditors' work life and experience?
    - Can these new technologies be deemed useful in ensuring quality auditing, reducing human error and reducing the auditors' workload?
    - Will auditors be able to upskill themselves with the necessary skills and knowledge needed in order to keep up with this shift and transformation of the audit process?

This chapter argues that the auditor should have the necessary skills and knowledge to keep up with the emergence of new technologies. Additionally, the ability of the professionals to keep up with technological advancements and assess the benefits of these technologies will aid in understanding the extent to which auditors need to improve their skill set and knowledge in the profession.

Factors Influencing Audit Quality

Satava, Caldwell and Richards (2006) define audit quality as an audit that involves auditors displaying appropriate values, ethics, and attitudes. This means that the auditors would have to possess and display the appropriate knowledge, skills, and experience to conduct a quality audit and invest enough time and resources in the engagements they are faced with. The process would involve a rigorous audit and a quality control process that complies with the appropriate laws, regulations, and auditing standards (Francis, 2011). This will result in the appropriate outputs for all the relevant stakeholders (IFAC, n.d.a).

When reviewing these arguments, technological developments and advances can support the rigour of the audit process. From this view, it can be argued that new technologies (audit software and tools) increase the probability of increased quality mainly because testing can now happen beyond sampling to analysing 100% of the available information and transactions conducted by an audit firm (ICAEW, 2020). The human element is still critical to filtering, communicating, and advising clients based on the available information (ICAEW, 2018). This means that human error, experience, and talent are still the underlying factors that determine the quality of decisions made.

The Impact of Technology on Audit Quality

The impact of technology on audit quality in South Africa has been significant in understanding how auditors experience their work and their work lives.

The first theme of the interview schedule comprised general questions. The purpose of these questions was to establish the background information of the research participants. The first question was to establish the auditors' role and years of experience at their designated firms. Their auditing experience ranged from two to 15 years in the audit profession.

In the first section of the interview schedule, titled, *The Changing Nature of the Audit Profession*, the participants were asked if they were part of the audit team at their designated companies, to which the response was 'yes.' Using teams with diverse skills boosts audit effectiveness, as team members bring together their knowledge and expertise

to ensure that the audit is done correctly (Owhoso, Messier and Lynch, 2002) while distributing the work by allocating different audit sections to team members (Udeh cited in Ghanoum and Alaba, 2020).

It was observed that the experience level of the participants varied in terms of the years of experience each participant had. The other observation was that some of the auditors interviewed for Cohort B have managerial roles while entry-level auditors assume supportive roles to their senior/supervisor, which was found to be the case for the auditors that formed Cohort A. Concerning audit quality, the overwhelming majority of the participants acknowledged the increased efficiency they experienced with the new technologies while indicating that they felt that the new or enhanced audit software and tools they used provided more autonomy and speed to their work. Most of the participants indicated that their academic learning did not expose them to specialised auditing software, stating in their responses that they were more exposed to Microsoft Office, especially Microsoft Excel, which is the main software tool they learnt to use in their academic studies. While this audit tool is still relevant to their work, it would not be enough to carry out all audit work, although it provides a good foundation for the profession and is essential (Owhoso *et al*., 2002).

The third section of the interview schedule sought to gauge the auditors' experiences with the audit software or audit tools when performing their audit duties and assess their usefulness during the audit process. The first question in this section was as follows, *"Are the Artificial Intelligence systems (audit software packages) that you work with easy to use?"* Susie from Cohort A responded:

> *"Yes, it is very easy. The first one, yes. The MEG Tool is very easy to use. I think if you get training for a day, you will know within a week how to use it. Yes, I'd say yes, and then, TeamMate, I think it would need some time for you to understand, but I don't think it is that difficult for you to understand. So, I don't know, I would say no, they are not difficult to understand."* (Participant Interview, Susie from Cohort A, 20/01/2022)

Another research participant had the following to say:

> *"Definitely. It's important to also have that technological background because it makes it easier to actually understand and actually use those software packages cause if you don't, you will definitely struggle, but I think they've definitely made it very easy and user-friendly for not only us but, also the client as I mentioned before. So that once the client wants to actually use that, they are also able to actually use it, and within that software package, there are also options whereby, like your Chatbot, for instance, whereby, you can actually just type what you require or what you need from that specific application or software and, the Chatbot itself gives you options in terms of how to manoeuvre to a specific screen or tab or whatever's in that specific software. So, I think the Fourth Industrial Revolution has definitely improved. As I mentioned, the Chatbot element is something that most applications or software don't have, but with regards to the one that we currently use, there is definitely improvement in terms of guidance on how to operate that specific software."* (Participant Interview, Polo from Cohort A, 28/01/2022)

Auditors' familiarity with various audit software and audit tools is evident in their responses; for example, the first participant admitted familiarity with the MEG Tool and TeamMate, while informant two is also familiar with CaseWare IDEA/IDEA and CLARA.[7] Regardless of the two participants mentioned above, all the participants interviewed seemed familiar with at least one auditing software or audit tool, which was the trend throughout. The information provided by Polo (Interview participant from Cohort A) is precise and shows outstanding confidence regarding the usefulness of the auditing software.

This section of the interview schedule also sought to assess if there were any perceivable differences between the AI systems, that is, in terms of how easy each one is to use. The question posed was as follows, *"Is there a perceivable difference between the IT audit tools in terms of how easy each one is to use?"* The research participants from both cohorts responded 'yes,' to experiencing perceivable differences in the auditing software or tools they were exposed to. Further, they stated they experienced a difference in the

[7] CLARA – an audit software utilised by one of the Big 4 firms. It improves and streamlines the entire audit process by providing a single central secure platform and ensuring a consistent and transparent working method (KPMG, 2023).

time required to learn how to use the software in terms of the built-in functionality of the audit software or tool. Felicity, from Cohort B, had the following to say:

> *"Yes, definitely. They each require a different level of understanding and utilisation before they are easy to use. Each software requires different time frames to learn and fully integrate into a specific auditor's workflow. However, I am unsure how to categorise each AI system with the ones I have been exposed to. The difference between how easy each one is to use is that they require different learning methods and time frames. For instance, DataSnipper was simple for me to learn, but after understanding how to apply it to my workflow and other systems, I needed more time. Thus, working through it with other colleagues or an online course and so forth."* (Participant Interview, Felicity from Cohort B, 18/04/2022)

Also, worth noting is that some audit software/tools are user-friendly and differ in complexity and sophistication. However, as other participants mentioned, being technologically savvy can contribute to a quicker and better understanding of the software and tools available for use in audit practice. Thus, it is important for an auditor to continually learn and upskill themselves to keep up and stay relevant within their profession.

The third question in this section of the interview sought to establish the perceived usefulness of each AI system in auditing. The question posed was as follows, *"What is the perceived usefulness of each Artificial Intelligence type in auditing?"* All the participants' responses pointed out that the audit software/tools they used were useful in enhancing expeditious completion of auditing tasks. One of the research participants had the following to say:

> *"In order for the package to be used, it needs to be crucial in the auditing process, particularly in increasing the quality of the output. Anything less and it would be a hindrance instead of an enhancement. Each system contributes a different aspect to the full picture of a quality audit, depending on the company and how it functions with clients."* (Participant Interview, Felicity from Cohort B, 28/04/2022)

Susie, from Cohort A, responded in the following way:

> *"So, for the MEG Tool, I think it's useful during the execution stage, execution stage, which is now when you're actually testing the controls, coming up with the risks and, coming up with the procedures and trying to rate the risk to see if it is significant. And then with TeamMate, it helps basically from beginning to end, which is planning, execution, reporting, reviewing and follow-up audits, right? So, as I was saying, TeamMate is a bit more comprehensive, so it would help you in the whole audit process."*

Susie (Cohort A, 20/01/2022) further added:

> "*It's always about efficiency and effectiveness. The efficiency, value add, and quality that the audit software brings to the audit practice. Obviously, if you are using the audit software, it's much quicker, it helps the analysis, and speeds the delivery of reports, more or less in quick time than on your manual Excel format that we actually use at times."* (Participant Interview, Susie from Cohort A, 20/01/2022)

The opinion provided by many of the participants indicated that, overall, despite the diverse nature of the audit software and audit tools that are used by different audit firms in South Africa, they all bring in efficiency and effectiveness to the audit practice and the profession. This enhances and aids in the maintenance of audit quality. It is important to note that the audit software/tools differ in complexity and sophistication; thus, they all contribute to the audit process.

It can also be implied from the participants interviewed that the level of experience counts as well, especially when using more complex and advanced IT audit tools, which may take a bit more time to master and use. This was brought to light by Motloulela, stating in their response that:

> *"Yes, the one for KPMG; I found it difficult sometimes at the start. They teach you theoretically in the early stages; it won't make sense. It only starts to make sense when you start to do the application part, meaning you will start learning as you do. Then, with proper guidance and consultation, you can*

> *improve with time, and that way, the auditing software becomes easier to use."* (Participant Interview, Motloulela from Cohort A, 16/12/2021)

Another critical question in this section asked participants to determine the usefulness of AI in the audit process. The participants were asked to rate the audit software on a scale of 1-10, with 10 being the highest score. The observable trend in this section is that the interviewees gave the AI systems a minimum score of seven. For example, Lutendo from Cohort B (13/04/2022) reinforced the statement made by Motloulela (see above) in her rating of the efficiency and effectiveness that AI systems bring to the audit practice. Thami from Cohort B (17/03/2022) gave a rating of 9 and provided the same opinion as quoted:

> "*Obviously, if you are using the audit software, it's much quicker, it helps the analysis and also it speeds the delivery of reports, more or less in quick time than on your manual Excel format that we actually use at times."* (Interview Participant, Thami from Cohort B, 17/03/2022)

All other interviewees awarded a score of at least seven points. The average score for the 'AI Systems and their Usefulness in the Audit Process' section in the interview schedule was eight. This highlighted that AI systems strongly enhance both the effectiveness and efficiency of auditing.

The Changing Nature of the Audit Profession

The second theme of the interview sought to assess the auditors' experience with the gradual changes that are taking place in the audit profession and in their workplaces. This interview section was meant to see how the audit profession has been influenced and possibly changed since the introduction of AI systems.

The first question in this section of the interview was posed as follows, "Has your firm introduced any new software packages? If so, what are they? Do you use them, and how exactly did you learn to use them?" All the research participants responded 'yes' to using software to conduct their audit work. Notably, the software used for audit work by the research participants in their respective organisation was somewhat different. The most

commonly used audit tool was Microsoft Excel, which had add-ons. However, large firms used custom-made auditing software, as highlighted by various research participants who worked for these firms in South Africa.

The second question in this section of the interview was posed as follows, *"How have the new audit software packages affected your working life and the manner in which you experience your work as an auditor?"* Felicity responded:

> *"The packages have greatly improved my efficiency and accuracy and created greater ease in performing tasks that were once tedious within the auditing process. However, if I am being frank, at times, it can be frustrating to have to learn how to integrate software I'm unfamiliar with into my workflow. It makes me nervous about any errors I could make during the learning curve. Thankfully, there are measures in place to help with those errors in the form of AI software as well."* (Participant Interview, Felicity from Cohort B, 18/04/2022)

It was observed from the analysis of the data collected that the introduction of audit software had significantly improved the way auditors perform their duties, given that some research participants were quoted saying that in the past, before the advent of AI, audit tasks were generally done manually, but now most tasks have been automated in software that is all-encompassing with very useful advanced tools.

Polo from Cohort A (28/01/2022) said the following:

> "*…so I know there's has been a significant change in terms of where auditing was five years ago and where it is right now, in terms of how we do our audits because if you were to look at how audits were performed last year and in the last five years, they were mainly on documents being in your Excel document or Word document but then; over the years it's definitely changed and improved cause even now we basically on a software called, CLARA, whereby, we conduct our audits, and it also allows the clients to actually have access to see what's actually being done on that specific engagement or audit.*" (Participant Interview, Polo from Cohort A, 28/01/2022)

How Technology Impacts the Auditors' Workload

As discussed earlier, technologies have had a significant impact on efficiency. However, it must also be noted that while this is true, client expectations and technology also now make it possible to move away from sampling techniques to analysing entire data sets for transactions; this means that there is a possibility that the volume of workload would increase as new technology applications increase.

> *"At times, you just have a lot of work to do, so you have to start prioritising the more important work. This is also where the software works in your favour because it will do most of the work for you."* (Participant Interview, Tendani from Cohort B, 24/03/2022)

The participants were asked about the usefulness of audit software packages/tools in ensuring (a) quality auditing and (b) reducing workload. Research participants were in unison with regard to the usefulness of the audit software/tool in reducing their workload, with one of the participants having the following to say:

> "*Absolutely. To be honest, they have become more of a necessity. The software has drastically reduced workload by applying simplicity to the process, reducing workload as a result."* (Participant Interview, Felicity from Cohort B, 18/04/2022)

The research participants also highlighted that audit quality significantly improved with the introduction of audit software/tools. Trinity had the following to say:

> "*…in terms of accuracy, there is no typing error or human error in bringing data on or maybe not seeing correctly or seeing properly whilst you're comparing the data cause, there is human error in that factor. So, I think that is eliminated by having the numbers imported into Excel and running it as a true or false equation. So, yeah, I definitely think it aids in accuracy and efficiency.*" (Participant Interview, Trinity from Cohort B, 04/02/2022)

According to Noordin, Hussainey and Hayek (2022), IT audit tools (audit software and tools) contributed immensely to audit quality for all different-sized audit firms. This was generally reflected in the participants' responses, as they also came from different-sized

firms. This was confirmed by this study's participants. However, to get a holistic view of whether this is correct, it would be useful to get feedback from other stakeholders, including clients, to determine if they believed that the use of technology-enhanced the experience and to determine if they found incremental or sudden improvements in the audit quality and speed of execution as claimed by participants and other researchers.

Nevertheless, some of the auditors interviewed did not share the same enthusiasm regarding the impact that these AI systems have on their workload. With more efficiency and less time-consuming than the software/tool made for their work, it still did not have as much effect on reducing their workload. Below are two responses, one from a participant in Cohort A and another from a participant in Cohort B:

> *"I'm not sure about reducing workload cause there's quite a lot of admin that comes with it, but that's just for your quality purposes. There are always quality reviews at the end of each audit. So, with that comes a lot of admin, but I mean, that means that we've improved our quality. It's better for us to make sure the quality of the work that we produce is good, you know, so in terms of that, yes."* (Participant Interview, Mbali from Cohort A, 20/12/2021)

> *"Audit will forever be audit. Whether we introduce the Fourth Industrial Revolution or artificial intelligence. So, think about it this was right? The artificial intelligence we use to enable the easier interpretation of data, so with data influx, more interpretation and interpretation require human intervention. Softwares do not reduce our workload."* (Participant Interview, Clive from Cohort B, 11/04/2022)

Annabelle from Cohort B further added:

> *"It just assists us with the basic stuff."* (Participant Interview, Annabelle from Cohort B, 11/04/2022).

The above statements from the participants prove that although there is evidence that the audit software and audit tools they are exposed to aid in saving them time and ensure that their work is done with much efficacy, in some instances, it does not always reduce the amount of work they have or get.

To ensure that this dynamic between IT audit tools (audit software and audit tools) and the auditor, it was important to get insight into how the auditor perceives them and how they navigate or use these systems to their advantage.

The Technological Learning Curve in Auditing

The digital landscape has necessitated the need for students to navigate an even faster information landscape (Nienaber, 2022). Utilising new technology requires auditors to quickly familiarise themselves with new tools, methods, and software. Proper training and support may not always be available to ensure this is done, and sometimes auditors may need to take training into their own hands with manuals, digital platforms like YouTube, and other available options (Participant Interview, Trinity from Cohort A, 04/02/2022). This can cause a lot of stress, anxiety, and frustration, not to mention that often this training may need to be conducted outside normal working hours, thereby eating into the auditors' free time as they now have to make time to find other means to learn how to use the software (Participant Interview, Clive from Cohort B, 11/04/2022).

This phenomenon may represent the untold story of the cost of auditors and audit firms adopting new technology. This is indicative of what may translate into client frustration, as often, the new technology that has been recently learnt has to be explained to clients' employees, and they, in turn, must be trained by the same auditors to use them. This was one of the concerns explained by Clive from Cohort B (11/04/2022), often rendering the previous engagements, communication, and document-sharing protocols obsolete. A slow learning curve can lead to challenges with job security (failure to get contracts extended by the employee), general frustration and stress, and missing out on promotional prospects (Issa, Sun and Vasarhelyi, 2016).

By observing the participants' responses, it can be said that in South Africa, as in other regions, the technological learning curve in auditing is a journey of adaptation and transformation. Auditors and audit firms that effectively navigate this curve can harness the full potential of technology to enhance audit quality, provide valuable insights to clients, and remain competitive in a rapidly evolving profession. Thus, it is important that the auditors' perceptions of the audit software and audit tools are positive, as it will aid

in a better interaction (between the auditor and the audit software/tool) and will create an even better work experience for the auditor.

Perceptions of Artificial Intelligence Systems

The fourth section of the interview sought to understand how the use of AI systems, such as audit software packages and audit tools, contributed to audit quality. Additionally, how these AI systems yield results reflects objectivity and credibility when maintaining good auditing standards.

The first question in this section of the interview was posed as follows, "What is the recognised contribution of each AI system to audit quality in the audit process?" An American Institute of Certified Public Accountants (AICPA) study shows that the use of audit software systems eliminates the risks of human error in the repetitive analysis of an organisation's data. Simultaneously, it recognises that these tools may present the ability to analyse vast volumes of data and recognise patterns, relationships, and distortions that are not always evident to auditors, but that require their knowledge and professional experience to assess that the results are true and materially relevant to the overall audit context (Rodrigues, Pereira, Ferreira da Silva and Ribeiro cited in AICPA and Canada, 2022).

In the same light as the AICPA study above, Felicity from Cohort B voiced the same opinion:

> *"Well, there are several aspects that each AI contributes, obviously efficiency and workload reduction without compromising the quality, on a regular basis. Cloud-based systems have enhanced teamwork and syncing with co-workers and/or clients. It becomes a breeze to share files and apply changes, compare, and ensure accuracy, which I cannot express enough about its importance in the process. Some systems create a sort of tunnel vision (for lack of better wording) when it comes to executing tasks, allowing focus on key areas. It will require completion of certain aspects of the audit before you can continue working on the file while creating a seamless way of double*

checking or reviewing the process holistically." (Participant Interview, Felicity from Cohort B, 18/04/2022)

The second question sought to establish whether there is a recognisable difference between the contributions of each type of AI system to audit quality and the audit process. Here, the study aimed to understand how the use of these packages contributes to audit quality and how the results reflect the objectivity and credibility of an auditor in terms of maintaining good auditing standards. Felicity from Cohort B further added in her response that:

"*The recognisable difference would be that each system is tailor-made for a specific task, functionally based on using specific methods to execute within the process. For instance, Excel is great on its own; it is well-designed for the job. However, the additions of AI software reveal that it is time-consuming to use on its own. Thus, the add-ons make it easier and reduce the time to use Excel in the audit process, improving quality. Cloud-based systems create a way to work in teams and seamlessly work on common projects. Other software also provides ways to identify anomalies, detect fraud, and create ways to maintain consistency and minimal performance of the same kind of tasks from the preparation and the reviewing in the audit process."* (Participant Interview, Felicity from Cohort B, 18/04/2022)

The other aspect where differences occur is not just in what the audit software can do, but it is also in how user-friendly the software is or the perceived user-friendliness of the audit software/tools by the auditors interviewed. This was highlighted in one of the participant's responses:

"*Definitely. I mean, obviously, it comes with experience cause nothing is ever easy at your first attempt, but personally, comparing to different software that I've definitely used within the workspace that I'm currently in, the one that I'm currently working on, which is the CLARA is definitely user-friendly and I think it allows you to grow; like I'm definitely learning something new every day and with you learning I think, it gives you an element of just showing you how easy it is to use and how user-friendly it is to use."* (Participant Interview, Polo from Cohort A, 28/01/2022)

The last question of the interview in this section sought to establish which of the AI system types reflects the auditor's objectivity, credibility, and maintenance of good audit standards, with one of the participants having the following to say:

> "*The one system that comes to mind on this question is Spotlight*[8]*. So, with this system, synergy with the team and all other relevant parties is elevated. We can basically perform different functions such as testing journal entries, access a multitude of insights, evaluations and plenty other analytics and run tests. These are available to be shared across the board to ensure we work well together on projects and maintain legitimacy. It becomes imperative for auditors to keep up their integrity while executing the objectives of our duties according to legislation/governance. Failure to do so will be problematic and open to evaluation by all parties with access to the analytics. Therefore, if I am to conduct myself in a manner that fails to reflect my objectivity and credibility and maintain good standards, then it is reflected through this application, and measures are taken. Let's just say I do my best not just for myself, personally, but to maintain the company and my colleagues' standards. We ensure that we deliver high service to clients and the company."* (Participant Interview, Glen from Cohort B, 23/03/2022)

The general trend from the respondents is that different organisations use different AI systems; thus, each respondent was generally supportive of the audit software they use at their organisation. However, it is important to note that a few respondents who use TeamMate as the primary audit software highlighted that it was their audit software of choice.

Conclusion

The overall purpose of this chapter was to explore the usefulness of audit software packages to the auditor, the risks, and the benefits that the introduction and implementation of AI systems (i.e., auditing software packages) have on the auditing

[8] Spotlight is "an integrated analytics application that delivers self-service analytics directly into the hands of the practitioner" (Deloitte, 2020:2).

profession through the eyes of the auditor. The findings indicate that advanced technologies, namely, AI systems (audit software packages and/or audit tools), are used in all parts of the audit process, from planning the audit to the completion of the final report. The empirical findings suggest that digitalisation has streamlined the planning phase, and Big data and analytics can be useful at the planning stage of the audit process. Moreover, it will evaluate the implications of audit software packages, how they shape the world of auditing, and what this possibly means for the future of the auditing profession. It will also evaluate the moral and ethical implications of these auditing software packages. Lastly, to evaluate whether auditors will be able to upskill themselves. The analysis of the responses gathered from the 19 professional South African auditors provides evidence that AI systems are widely useful in enhancing audit efficiency and effectiveness in the audit process. It was observed that the introduction of auditing software had significantly improved the way auditors performed their duties, given that some research participants were quoted saying back in the days, before the advent of AI, the tasks were generally done manually, but now most tasks have generally been automated in software that is all-encompassing with useful advanced tools. The opinion provided by many of the research participants also indicated that, overall, despite the diverse nature of the audit software that are used by different audit firms, they all bring in efficiency and effectiveness to the audit practice, thereby enhancing audit quality. What is important to note as well is that the software differs in terms of complexity and sophistication.

This chapter gave an extensive account of the research participants' perspectives on experiences and perceptions in the wake of AI systems (audit software/audit tools) and how they have transformed the audit process, thereby bringing about audit quality. The findings indicated that AI systems are used in all parts of the audit process, from planning the audit to completing the final report. Furthermore, it is important to understand the impact of technology on the South African audit profession. This will enable us to understand the implications for the profession and all its stakeholders. This is what the next chapter will discuss.

CHAPTER SIX – THE FUTURE OF AUDITING AND SKILLS DEVELOPMENT

Introduction

Undoubtedly, the South African audit profession is influenced, shaped, and impacted by the introduction and use of AI systems such as audit software and tools. As mentioned in previous chapters, the development of the technology used in the profession, regulatory changes, and industry dynamics continue to transform the profession as we know it today. Understanding and having insight into what the South African audit profession might look like in the future depends on what is occurring currently. Furthermore, this transformation comes with its own requirements and implications, particularly for the auditor tasked to work with these technologies on a day-to-day basis.

This chapter discusses the limitations of AI. The focus is on the human element of the South African audit profession, delving deeper into why human beings will continue to be an integral part of the audit process. This chapter argues that AI cannot replace the human element in this profession; it, instead, complements it. This chapter is aimed at answering the following questions:

- Will auditors be able to upskill themselves with the necessary skills and knowledge needed in order to keep up with this shift and transformation of the audit process?
- What are the implications of using IT audit tools (audit software packages/audit tools) for the auditor?

The questions were aimed not only at understanding the auditors' perspectives on the profession as it is currently, but also their thoughts on the future profile of the South African audit profession. Furthermore, the goal was to gain insight into what the auditors thought they needed in order to keep up with the digital transformation within their profession and their thoughts on the implications of this change. Moreover, it was to see what the auditors' thoughts and perceptions were on skills development and what else could be done to ensure that those yet to join the profession (i.e., students) are not completely lost and confused when joining the profession.

To support this argument, this chapter explores employee participation considering a digital transformation. In particular, the thoughts, views, and perceptions of the audit professionals will be one of the subjects covered. This will be employed through the concept of unlearning, which emphasises the auditors' ability to almost alleviate all, if not some, of their old working habits to adopt new ones that will be of great significance when using any new audit software and tools that have been introduced.

The Human Aspect of the Audit Profession

The gradual yet continuous technological advancements have played a significant role in influencing and implementing organisational change; such is the reality that many audit firms face (Suddaby, Cooper and Greenwood, 2007). According to Hagberg, Sundstrom and Egels-Zandén (2016), the digitalisation and automation of work processes have become the leading cause of the digital transformation in modern society, impacting the work life and experiences of those tasked with working with IT audit tools. It is not unusual for conversations about the future of the working environment to occur. Particularly, in the audit profession, this transformation seems to take place the most as a profession continuously affected by technological developments and advancements (Computer Science Online, cited in Frey and Osborne, 2017:254-255). One will, at some point, wonder about the future of unemployment and, if it is not looming, additionally, wonder whether audit professionals will be able to keep up with all that is needed of them to stay relevant within this profession. As such, it is important for the organisation to take full advantage of including their auditors in introducing new audit software and tools to ensure that the use of these technologies in the audit process is a success (Albawwat and AI Frijat, 2021). Therefore, although it is essential to the company's success to improve the client's experience and gain a competitive market against competitors (Albawwat and AI Frijat, 2021), the audit profession should also consider their employees' experiences when it comes to this.

Thus, organisations need to consider organisational support and whether this is beneficial to the auditor and how they can make the auditors' working experience a positive one, thus benefitting them too.

The organisations within the audit profession need to ask the right questions, such as, “Does the organisation provide opportunities for growth and skills development?” when a new software or tool is introduced. Additionally, “Is there enough organisational support for the auditor tasked to work with these new software and/or tools?” All these factors need to be considered from the auditors’ perspectives as they are imperative to understanding the implications of this on the auditors' work and their experience. With the above in mind, this section of chapter six will discuss employee participation in relation to the concept of unlearning.

Employee Participation and the Concept of Unlearning

As discussed in the literature review of this dissertation, individual unlearning plays a considerable role in the successful implementation and use of newly introduced or added audit software and audit tools. As such, this section of this dissertation discusses employee participation or inclusion in the digital transformation of the audit profession. This is married to the concept of unlearning and its implementation by the auditor in terms of changed behaviours/unlearnt behaviours through discarding or changing old working habits to learn new ones.

However, to determine whether the auditors will be able to deal with the changes implemented by their designated workplace, it is important to know whether they were happy before this change was implemented. The auditors’ prior outlook regarding the IT audit tools introduced and integrated into their work processes was then investigated. This was imperative to understanding the auditors’ perspectives on their profession as it is today and what they thought it might look like in the future. The goal here was to gain insight into whether the auditors had a positive outlook before any changes occurred at their workplace. Furthermore, the questions asked in the interview schedule were to understand the auditors’ perspectives on digital transformation and to gain insight into whether they feel and think that introducing new technologies to their work processes was necessary.

Moreover, asking the auditors questions on what they thought their work environment and work, in general, would look like in the future in the context of what is taking place

today was integral to getting insight into the extent to which the auditors felt they had the necessary skills and knowledge to stay relevant within their profession. This was also to gauge their thoughts on the upskilling of auditors to stay relevant in their field so that they are not left behind or faced with possible unemployment. After analysing the data collected for the purpose of the factors mentioned above, it was found that 14 participants (six from Cohort A and eight from Cohort B) had a positive response regarding how they were experiencing the audit software/tools and their work. Five (three from Cohort A and two from Cohort B) of the participants reported that they had a negative experience with the software/tools introduced and how they impacted their work. This showed, to a large extent, that both groups had a rather positive perspective on the available audit software and tools, as well as their add-ons. The auditors interviewed stated in their responses that their positive outlook on the available software at their place stemmed from the fact that they did not see the introduction of new audit software and audit tools as something brought in to replace the auditor. They further stated in their responses that they saw this as more of an opportunity to grow within their profession and an opportunity for job creation for the auditor and others.

> *"No, not really. It doesn't create issues on job retention. For me, it actually creates opportunity. It creates an opportunity because we're gonna now almost have different roles now cause, you know what, there is an AI specialist that's needed now, you know. There's development of these tools and things to look out for that is actually needed. So, for me, it creates more opportunity and which where we can leverage to say, guys, the people we used to for these things can actually create, can plug-in gaps here because there are new tools now. Those tools need to be maintained; those tools need to be monitored. All those things need to happen because you're introducing something new, but that doesn't necessarily mean you're taking away jobs from the old. It just means we need to reskill ourselves, think differently, and redistribute ourselves differently when it gets to firms and the work that needs to be done.*" (Participant Interview, Glen from Cohort B, 23/03/2022)

> *"I think the key thing with advancing technology is that you just always need to have the mind to or the willingness to learn. (…) So, I think the key thing it takes is the willingness to learn, and I think I do have that. I'm always willing*

> *to learn and see how best; whatever new thing I'm getting into will help me, you know. I don't think something would just be introduced just for the fun of it. There's definitely an advantage to it being introduced."* (Participant Interview, Mbali from Cohort A, 20/12/2021)

Nevertheless, not all the participants were as positive about the use of audit software and tools. Some responses were not so positive that came from participants from both cohorts, especially around job retention:

> *"(…) nine years and become a registered auditor because that won't be necessary. The systems are gonna become so easy to use that auditing is as easy to do as a Turnitin report, which means a company will be able to obtain its own audit report by just submitting its financials to some software, and the software does it in thirty seconds."*(Participant Interview, Tshipfisa from Cohort A, 21/01/2022)

In light of the above responses, getting insight into the auditors' thoughts and perspectives on the continuous upgrade, add-ons, and the introduction and exposure to new audit software and audit tools was imperative. This was crucial in understanding the extent to which the participants felt confident about the digital transformation at their workplace or whether they perceived this as something that would impact how they experienced their work negatively, thus seeing the audit software as something that would be a challenge to work with. After analysing the participants' responses, it was clear that there was a more positive reception of the audit software and tools from Cohort B (more experienced) and a more negative one from Cohort A (less experienced). This was indicative of the differing opinions between the two cohorts on the digital transformation taking place. There was also a clear indication that the more experience one had in the profession (which also meant being exposed to audit software for a longer period), the more open they were to the exposure and use of new technology.

Furthermore, this indicated the participants' perceptions towards the digital transformation, which also told how they felt about how this impacted their work and how they experienced their work considering the changes taking place. Participants from Cohort B responded positively to the introduction and use of new audit software and tools, as well as their add-ons, and seemed more open to the idea. The reasoning behind this

seemed to be that the new software and tools added to their efficiency, alleviating mundane tasks and allowing them to focus on the more complex tasks they might have:

> *"I would say it has made life easier because some of these tools that we use can digest a lot of data, saving us a lot of time. So, you just dump your data, and it can be sorted out in a manner that is understandable and easy to follow."* (Participant Interview, Tendani from Cohort B, 24/03/2022).

> *"They make audit work easier, and they're good. They have their advantages and disadvantages. One of the advantages is the integration in terms of the work that we do and specifically the methodology that you don't miss a step in terms of quality of the audit at the end of the day and in their [inaudible audio] of checking workflow and stuff, monitoring and supervising is relatively easier on them. And the one thing would be that they're easily accessible and that there is storage of information, so record keeping is also good."* (Participant Interview, Clement from Cohort B, 04/04/2022)

The software proved beneficial to the auditors, allowing them to sort through complex data sets while ensuring that they follow each audit step meticulously, reducing human error. This also means that the auditor can rest assured that the audit was performed in a manner that is efficient and of the utmost accuracy. This would also improve their workflow, overall experience of the audit software/tool, and how they experience their work.

Although a vast majority of the participants had positive perceptions and experiences of the software integrated into their work processes, some were finding it difficult to relate. One such participant was from Cohort A, stating the following in their response:

> *"They haven't changed that, like, my work life significantly, but then, like, it's been quite a stretch cause despite the fact that they gave us training, like something's you know, you don't always understand everything during training."* (Participant Interview, Chelsea from Cohort A, 29/01/2022)

The above responses were indicative of the different opinions on how, when working with the available software/tool, it was important to get insight into the type of

organisational support the auditors receive in terms of training. Particularly training on any new software/tool introduced or added to the already available software.

Support in the Workplace – Leadership and Training

To gain further insight into the auditors' experiences in their work life and experiences, it was important to get an idea of the type of organisational support during and after training on a newly introduced software or add-on to an available one. Imperative to the auditors having a rewarding experience with the audit software and tools they are tasked to work with is the training they receive regarding the use of these technologies and the leadership within their workplace.

As with any other newly taught programme, there is an expectation or the assumption that such teaching plays a significant role in imparting the knowledge in a conducive manner. This aids in establishing and ensuring that the auditor can adapt to the use of the new audit software and tools introduced. Looking into the executive management and training aspect, particularly concerning organisational support in the workplace, was of great significance. This would aid in understanding whether the auditors perceived their executive management's involvement in the training process as something helpful to them. This further allowed for a deeper understanding of how this might or might not impact the auditors' adoption and adaptation to the software/tool. As previously mentioned, there were different opinions on how the auditors experienced their training at their designated place of work. Nevertheless, a vast majority of the auditors interviewed seemed to agree that the training they received was helpful and beneficial to them, and both Cohorts A and B were unanimous regarding this aspect.

This was also a means to establish what the auditors' work environments are likely to know and the impact that this has on the auditors' experience of their work. In doing this, the researcher got an idea of how involved the executive management was in the training. Additionally, this helped gauge whether the executive management knew about the audit software and tools they use for approvals. The participants seemed to have and show more faith in their supervisors as they are the ones they work closely with; they also expressed

that this was because the managers and supervisors worked with the same software that they did, too, making for a better understanding of the software for both parties:

> *"During our training, it doesn't really occur to me to ask my leader to explain some of the stuff they are training us on, so I will ask my supervisor instead; it's easier that way."* (Participant Interview [WhatsApp], Cantu from Cohort A, 25 July 2023)

Cantu further clarified that she felt more comfortable asking for help from her colleagues or supervisor when she was experiencing difficulties with a task. It was essential to also understand this notion (see Cantu's response above) from the management's point of view, hence asking the same question to one of the participants who also holds the supervisor position:

> *"As a supervisor at my workplace, I can tell you that there isn't that much involvement from 'the higher-ups'. So what MASA [audit firm the participant is employed by] will do is that they will either take us managers to training so that we teach those that work under us or they will hire a person to come and provide training for us all."* (Participant Interview [WhatsApp], Thami from Cohort B, 25 July 2023]

Essential to gaining more insight into the auditors' thoughts on the training provided by their place of work was asking questions on whether the auditors felt the training was beneficial to them/their work. This was to understand if the training offered was helpful in adopting, adapting, and using the audit software/tool to the auditor's workflow or if it felt like an obstacle.

> *"Yes, I do think that it [training] helps (…) And then, there's also some other training like, for soft skills that we do (…) So even those soft skills help us to be able to do our jobs even better. So, I would say yes."* (Participant Interview, Susie from Cohort A, 20/01/2022)

> *"Yes, it is helpful cause at the end, we get to learn about this new system and what we can do and what we can't do, and you actually already see an improvement that we have on the systems already."* (Participant Interview, Lutendo from Cohort B, 13/04/2022)

Through their responses, Susie (Cohort A) and Lutendo (Cohort B) indicate that the training the auditors receive is helpful. This also tells of the workplaces' facilitation of the training process, indicating that the training is done in a conducive environment that allows for productivity. This also tells us that the auditors' place of work is cognisant that they must consider how any changes might impact the auditor and the implications of this. This means that the company/firm considers the importance of the auditors' reception of the audit software/tool being introduced, as this will impact how the auditor performs their tasks and how they experience their work. Another important aspect of organisational support was finding out if the company/firm the auditors work for provides additional resources for training even after the formal training has passed. The auditors mentioned in their responses that they have access to other methods of training that would help them further understand and engage with the software they had been given training on. The majority also mentioned that they could ask their supervisor for help (see Cantu's interview response above) if they experienced any difficulties while using the new software/tool. An example of a resource outside of the usual training was mentioned by a participant in Cohort A, stating the following:

> *"Being in the bank environment, we're always provided access or free access to LinkedIn learning and Udemy courses, and also, there's a lot of CPD [Continuous Professional Development] sessions that take place, sometimes monthly and sometimes bi-monthly where we'll be up-skilled in some sort of way."* (Participant Interview, Trinity from Cohort A, 04/02/2022)

Continuing Professional Development (CPD) is a requirement of almost all regulated professions in South Africa and internationally. At its heart is recognising that professional knowledge and competence are continually changing due to ongoing technological developments, regulatory and legal requirements, work processes, and legal standards. The IRBA's Continuing Professional Development Policy indicates that it is mandatory for an RA to participate in CPD in order to keep themselves relevant in an ever-changing profession. According to the IRBA Code of Professional Conduct for Registered Auditors, there is an expectation that the RA will "attain and maintain professional knowledge and skill at the level required to ensure that clients receive competent professional services, based on current technical and professional standards and relevant legislation" (IRBA, n.d.d). Furthermore, this indicates that as an RA, one

needs to continuously learn in order to stay relevant within the profession. CPD is available through courses presented by the IRBA or in-house training programmes offered by an audit firm under IRBA's guidelines.

It is important to note that although some participants receive additional training resources, some (mostly in Cohort A) reported that they do not. These participants stated in their response that they struggled with the training and understanding of its contents and did not have any additional resources after the initial training. The participants further stated they would ask their supervisor for assistance, as previously mentioned, and sometimes colleagues or the popular search engine 'Google.' This also brought about questions on whether there was an adequate amount of time dedicated to the training to keep everyone up to date:

> *"I think, yes. There are enough people at work, so if you have an issue, for example, you can always approach your colleague and ask. Then also, I think for me personally, the internet is my friend, so if I find a problem with something I don't know how to do, I just go Google (…), but, also, there's capable colleagues that can help."* (Participant Interview, Cantu from Cohort A, 17/12/2021)

This was also indicative of the fact that experience plays a significant role in the way that auditors experience their work. Furthermore, this meant that the auditors had to take a much more proactive role in finding information that would be helpful to them in terms of the aid they need when it comes to using audit software and tools.

The participants' responses show us that the influence of colleagues with the same experience level and that of managers and supervisors play a considerable role in the auditors' perception of the audit software/tool and its use (see Cantu above). It also then makes one wonder what exactly the auditors' perception of the future of auditing might be in terms of the profession in South Africa. Furthermore, it aids in understanding the auditors' thoughts and perceptions regarding their careers and job retention in their professional capacity. This then brings us to the next section of this chapter, which uncovers what the auditors think the future profile of their profession might look like in the not-so-distant future. Additionally, it sheds light on whether the auditors believe that

they will still be relevant or needed in the future as technology continues to advance and, to some extent, take over some of the tasks that they would then have to do.

The Future of the Audit Profession in South Africa and the Upskilling of Ras

To understand what the auditors thought about the future of their profession and that of their individual careers, I thought it necessary to ask questions on this very topic. With IT audit tools such as audit software and tools, it is no wonder that most would worry about the future of their work and, of course, the profession. As demonstrated in the responses above, the introduction, upgrade, and use of new audit software and tools does, to some extent, change how the auditor experiences their work and the workflow within that work environment. Considering that there are continuous developments in technology and their advancements, this cannot be avoided. Adding new audit software technologies and tools has now become an integral part of the profession, pushing the auditor to adapt. This indicates a major impact on the profession, and it cannot be denied that this comes with its own set implications for the South African auditor. Introducing new audit software and tools or upgrading the ones already available is meant to help the auditor perform their work efficiently and more accurately (Albawwat and AI Frijat, 2021). It is also meant to benefit the auditor while conducting the audit processes in all its different stages, thus contributing to a possible change in the job description of the auditor and what that might look like further down the line.

As previously mentioned in this chapter, the audit software used by the participants has already taken over the more mundane or routine tasks. It is, in fact, providing the auditors with adequate support when they are conducting their work (Cooper, Holderness, Sorensen and Wood, 2019). This is what Trinity from Cohort A had to say in terms of the usefulness of the audit software he was exposed to and the work that it performed:

> *" (…) I think in the reduction of workload simply to how I said, the laborious task of having two screens with one as a pdf and one as an Excel sheet, trying to manually match the numbers is labour intensive, it's not efficient and, it's time that could be spent performing testing or something else in the planning. So, I think that it does make the audit more proficient and reduces the*

> *workload in that manner and in terms of accuracy, there is no typing error or human error in bringing data on or maybe not seeing correctly or seeing properly whilst you're comparing the data cause, there is human error in that factor. So, I think that is eliminated by having the numbers imported into Excel and running it as a true or false equation. So, I definitely think it aids in accuracy and efficiency."* (Participant Interview, Trinity from Cohort A, 02/02/2022)

Using these IT audit tools (audit software and tools) leads to accuracy and efficiency, as mentioned above, as well as the reduction of human error, which translates into a good quality audit. Therefore, with this in mind, we need to ask whether these software and tools can perform much more complex tasks without the input of auditors on tasks that would, under normal circumstances, require human intervention. When analysing the data from both Cohorts A and B (A – five years or less; B – five or more of experience in the audit profession), there seemed to be a mix of opinions, with some stating that this would be a positive change that would provide many opportunities for the auditor while others seemed indifferent:

> *"I think future auditor by itself, I think right now, an internal auditor can just be an internal auditor, right? And, there's a separation between internal audit and IT audit, right? But I think that won't be the case anymore in the future. So IT auditing, which is now kind of like separated but, not really, it's something that will be a requirement for an auditor and, that's because of the ever-changing of like, control environments or like, ever-changing like, things are speeding up right now and clients are having apps every day."*(Participant Interview, Susie from Cohort A, 20/01/2022)

> *"I mean, personally, I've seen the growth within the tech business unit or tech assurance business unit within my firm, and noticed how, even with your Chartered Accountants, most of them even end up actually joining tech assurance. The space, or the firm or all technology as a whole, or audit as a whole is moving towards the technology side of things cause it's more efficient and more, you know, I think it's growing. So, definitely, there is growth. And I definitely see that everyone is definitely going to move towards*

the technology space or side of audit." (Participant Interview, Polo from Cohort A, 28/01/2022)

"To be honest, with technological movements, human beings can never be so ready, especially in a country like ours where technology's not regulated. If we look at international countries, technology is regulated. The movement of technology is regulated, but with us, it's not. With us, anyone today can think about something very great and implement it, and we will support it, but if you look at the international platforms, it goes through rigorous research before something is updated before it's even applied. So within the context of South Africa again, I will say, the technological movement, we are never going to be at a point of comfortability for the following reasons: For those first-class world countries, we already have an interpretation of where they are going in the next 5/10 years in terms of their technology because they first assess, they implement, then only when it is now doable they bring it to the world. For us, 3rd and the 4th world class countries, what do we do? We just participate and partake, and by the time we participate and partake, they are already 5, 6, or 7 steps ahead of us. Now, we need to play catchup in terms of our human adaptability to these things. I'll give you a very odd example. I think in the past couple of months, we were exposed to the audit in Canada, where they were using the software to literally read PDFs, and summarised PDFs for them, and we don't have that this side. By the time it comes to South Africa, what we going to do? We're going to have to catchup and adapt. We have to first learn how to use it, integrate it into our software, you know, all these nitty gritties [the most basic and minute details about something] to be able to participate in the broader market, the broader international market. So, I think the readiness is in our country where technology is not really regulated. It is not really regulated. We will never be in a position of comfortability or ready in that sense, so, for us in the context of South African users, we are just going to be there to say, whatever manna throws, we shall utilise." (Participant Interview, Clive from Cohort B, 11/04/2022)

Analysing the two responses above from Susie and Polo (Cohort A), one can deduce that there is a similarity in how the two groups think of the impact of digitalisation on the

audit profession. There is a thought around IT and audit merging to become one. We can also see a change in the audit profession, as there is an integration or collaboration of skills and knowledge used when performing an audit. Looking at the response given by Clive, there is a clear difference in the manner in which the introduction and integration of audit software and tools are changing the South African audit profession. Although it cannot be denied that South Africa is a developing country, there is evidence that it is fast becoming technologically advanced and well-versed in these technologies (see chapter four). Therefore, there will always be a difference in the type of audit software introduced to and used in different-sized firms; this does not necessarily point to the profession not being regulated, but rather the difference in the advancements of these technologies as well as what the firm can afford. It is much easier for larger firms to implement/use technologies that are better in terms of use and ensuring effective and quality auditing than for much smaller firms. This suggests that multinational companies will be faster at technology transfer than national/local companies. It is also important to note the policies, regulations, and standards set for these organisations at both international and national levels to have a better understanding of how the technology is introduced, used, and adopted by different firms.

With the firms in the audit profession bringing people in to provide training or sending their employees out for training, there is an indication that there is indeed a future where IT and audit will merge and become one, thus creating job opportunities within the profession (see Thami above). A participant from Cohort A shared the following on the topic:

> *"Instead of being taught to actually adapt to IT auditing and CAT, as you may call it. We're actually just getting people to do that for us and, we just focus on what we can do and, you know, signing off reports and the admin of stuff but, eventually, we're going to get to a point where these AI systems can do the admin and the technical work; and when that happens, an auditor by profession who is generally someone with an accounting background won't be as useful as the IT team."* (Participant Interview, Tshipfisa from Cohort A, 21/01/2022)

This was also mentioned by Thami from Cohort B, stating in his response that his workplace would, in some instances, bring in people to provide them with training. To then gain insight on whether the auditors in question saw the introduction and use of new audit software tools as a threat to their jobs or not, the following question was posed, *"Do you believe you have the skills needed to keep up with the technological advancements that may be taking place within your profession?"* to which a vast majority of the participants agreed they did. Their responses suggest that the training they received was instrumental in ensuring that it is possible. The participants were also asked what they thought the future of their profession looked like since there were continuous developments in technology and a high probability of it advancing:

> *"(…) the ongoing training that we are provided is definitely advantageous in terms of ensuring that we have the skills; and personally, as I mentioned, I also have my own private lessons or skills that I actually perform, or rather I am performing (…) I would definitely say that besides the training that is provided at work, I also have, my own personal training and certifications that I'm working on to ensure that I have the necessary skills to actually do the audits that are actually required even in the future. I mean, we are already upskilling ourselves in terms of other certifications such as your CISA[9] [Certified Information Systems Auditor] that ensure that you are actually a certified auditor or IT Information Systems auditor in terms of ensuring that you have all the skills, not only based on your technological aspects but, in terms of less consulting as a whole. So, I think I definitely see myself as someone who definitely is within the correct space right now to actually be able to even adjust to whatever is coming in the future."* (Participant Interview, Polo from Cohort A, 28/01/2022)

In addition to finding out if the auditors thought they had the skill set and knowledge required to keep up with the technological advancements taking place in their profession, the researcher found that if auditors believed that students should receive practical training on computer technologies used in their profession. The general answer to the

[9] CISA (Certified Information Systems Auditor) – a certification issued by the Information Systems Audit and Control Association (ISACA). It is for audit professionals that handle information systems such audit control and security (ISACA, 2023).

question was 'yes,' stating in their responses that they think it would be helpful once the students join the profession as an audit professional that has gone through the stages of qualifying to be an RA.

> *"Yeah, no, definitely. That's very important cause I think there are a few things that I feel should be introduced from tertiary from a young level cause I think they really do equip you in terms of what to expect when you come into the workplace. And I think tertiaries should introduce your basics, man, your basics of auditing, your tech assurance, or any risk consulting type of audit that requires IT. So, I think it's important that even if it's the basics of IT auditing, I noticed that most tertiaries don't have that element of introducing that IT element. So, I think that it's essential that that's definitely introduced cause that's definitely where the audit space is going. That's the direction that the audit space is definitely taking."* (Participant Interview, Polo from Cohort A, 28/01/2022)

Although the members of both cohorts shared this idea, they had different ways of thinking about it:

> *"Well, I guess it's more around getting an understanding. At the end of the day, what tends to happen is that each firm has its own tool. So, it's not like there's one tool that everybody can actually use and deploy. Each firm actually gets to design its own tools and facilities so that at least it caters to their own need, you see, but the understanding of what's needed, I think it will be quite critical."* (Participant Interview, Glen from Cohort B, 23/03/2022)

Analysing the responses from Polo (Cohort A) and Glen (Cohort B), there is a similarity in that they both believe students should receive practical training in the computer software utilised in the audit profession. However, Glen seems to believe that the training should provide a basis for understanding the kind of software one might be exposed to in the work environment, and there cannot be one audit software/tool used across all businesses.

Conclusion

The main purpose of this chapter was to capture the human aspect of auditing and to understand whether this would still be considered in the future, considering technological advancements. Furthermore, it aimed to answer whether auditors could upskill themselves in the future and uncover the participants' thoughts on what they think the future of auditing looks like. The topics covered in this chapter proved that the auditors interviewed did not fear this transformation to digitalisation but embraced it. They saw this transformation as an opportunity for growth within their careers and as an opportunity to create new jobs for those yet to join the profession. In addition, the auditors believe that keeping an open mind and always being open to learning meant they could never fall behind on this transformation, stating that they receive training, and some go further to get personal training. This chapter also detailed the implications of introducing and integrating new audit software/tools to the auditors' work processes, which would change their role in the future as it has already begun altering it. It was imperative to this study to gain insight into the role that the auditors play in their workplace regarding the introduction and implementation of new audit software, as it would aid in the understanding of how the audit profession is being transformed.

Having analysed the participants' responses, the researcher was able to argue the implications that the introduction of new software and tools has on the auditor and their experience of their work in general. In the analysis of the data obtained, the researcher gained insights into the importance of training and organisational support from the auditors' workplace in facilitating these implications in a manner that is conducive and productive for the auditor. The researcher was able to argue the importance of proper facilitation processes from the auditors' workplace and, in turn, do the training in a manner that does not overwhelm the auditor with a lot to do, so much so that they cannot fully commit to the training and end up missing the content. Furthermore, this chapter argued that the auditors' work lives are impacted by the introduction and use of audit software and tools. The researcher was also able to argue that the experience auditors have with their executive management and supervisor was a huge determining factor of how well the newly introduced software would be received (both positive and negative).

The researcher also found a difference of opinions in both groups interviewed regarding their thoughts on the future of the audit profession in South Africa.

CHAPTER SEVEN – CONCLUSION

The infiltration of digitalisation into the workplace is a change and transformation that is seen globally. To keep up with the digital age, many businesses have resorted to investing in technology to help them keep up with the technological transformation. The South African audit profession is no exception to this phenomenon; hence, it is being impacted, influenced, and continuously shaped by this. Since the audit profession boasts high-quality standards due to the regulations set in place, it is important to investigate the impact of technology and its implications. This shift to the digitalisation and automation of the audit process directly impacts the profession and the auditors in it. This study aimed to capture and argue that the digitalisation and automation of the audit process directly impact South African auditors' work lives and experiences.

In chapter one of this dissertation, I provided background on the phenomenon that would be studied, outlining the issues surrounding the impact of digitalisation on the South African audit profession. I then discussed the existing literature in chapter two on the impact of digitalisation on the South African audit profession and its stakeholders. I argued in chapter two that there is a tendency to focus on the benefits of new audit technologies and tools on the profession itself rather than considering the effect that this has on the auditor and how they experience their work. The problem with this (as outlined in the problem statement in chapter one) is that it is limiting the holistic understanding of the impact of digitalisation on the audit profession. Therefore, the question, *"How has the introduction of Artificial Intelligence systems changed the audit profession and workplace, and what have been the experiences of South African auditors?"*

To get the answers needed for this dissertation, I utilised qualitative research methods outlined in chapter three of this dissertation. These methods allowed for the selection of participants that would be suitable for this study and the use of data collection methods that would allow the extraction of rich data. The data were then analysed to answer the main question of this dissertation. The data were then used to make the arguments in the finding's chapters (chapters four, five and six), which I discuss below.

Chapter four focused on the South African profession and the impact and influence that digital technologies have had on it. Here, I discussed the benefits and challenges of the

digitalisation and automation of the profession, especially the audit process. I did this by asking what new technologies were infiltrating the profession. Furthermore, by asking if these new technologies disrupt, influence, and shape the South African audit profession. To answer these questions, the chapter's content was situated into a conceptual framework, namely, 'The Sociology of Professions,' to understand what a profession sociologically is before delving deeper into the chapter. I then referred to the relevant legislation and regulatory frameworks around the audit profession in South Africa, aiding in a further understanding of what the profession is, what an auditor is, what it means to be an auditor, and what an audit is. I then argued that introducing and integrating technology into the profession influenced and shaped the profession and its stakeholders.

Chapter five focused on the audit process, ensuring audit quality and the implications on the auditors' work life. This chapter argued that auditors needed the necessary skill set and knowledge to stay relevant within their profession. Due to the regulatory nature of this profession, there is a need to stay within the ethics and considerations set out by IRBA. This is done while considering the technological advancements occurring within the profession, particularly regarding the audit software and tools that auditors use. To make my argument, I looked at the factors influencing audit quality and the impact of audit software and audit tools on these variables. The main objective was to understand these factors from the auditor's perspective, circling back to the main question of the impact of technology on the auditors' life at work. To aid in my argument, I asked whether the auditors felt the audit software packages were useful to them and whether they felt they could upskill themselves to keep up with technological advancements. This was to determine if the auditors had the right skill set and knowledge for this to occur, and I found that a vast majority of them believed that they did. Once again, I was able to argue that the digitalisation of the audit process has influenced the auditors' work life and how they view their roles as something that will change in the future.

Chapter six focused on the future of auditing and skills development. The digitalisation and automation of the audit profession influence the working life of the auditor; I wanted to find out what the auditors thought the future of the profession would be like and what implications this would have on their role/job description. The digitalisation of the audit process was not the only thing changing the profession; the regulatory frameworks and industry dynamics also played a part. The main objective here was to capture the human

aspect of the audit profession rather than looking at it as purely robotic. Therefore, this chapter argues that the human aspect of the profession must always be considered. To make this argument, I employed the concept of employee participation and the concept of unlearning, as well as removing the auditor from a passive to a more active standpoint. To capture this part of the dissertation from the auditors' perspective and gain insight into what they think. I then investigated support in the workplace, focusing specifically on the executive management's role in training and how this influences the auditors' perception of the audit software. I then argued that the role of management in any firm was of great significance in having a good reception and interaction with the software. Furthermore, I discovered that having colleagues that the auditors can go to for help when they are experiencing difficulties with the software, they were being trained on also played a part.

To conclude, the South African Audit Profession is gradually being changed, influenced, and shaped by the introduction and integration of AI systems (audit software packages and IT audit tools). This transformation has and continues to directly impact the auditor and the auditor's work role. Auditing has been propelled into unchartered territory by integrating AI systems such as IT audit tools and audit software packages. Considering this, it is no question that the South African Profession is changing as we know it. There is a consensus that the emergence and adoption of AI technologies have not merely introduced IT audit tools and audit software packages that have fundamentally altered the operational paradigms within auditing firms across South Africa. As auditors navigate this dynamic landscape, characterised by the infusion of AI-driven solutions in their work processes, a plethora of implications have surfaced, reshaping their roles, work environment, and professional expectations. The integration of AI systems has redefined the traditional audit processes, infusing automation, data analysis, and machine learning into once manual and time-consuming tasks. The IT audit tools and audit software packages provide efficiency and aid in reducing human error, making the audit more reliable. Adapting to these technological advancements, South African auditors have witnessed a profound shift in their day-to-day work practices, with routine tasks being automated and a greater focus on the less mundane tasks and more on the complex audit tasks. The advent of AI in the South African audit profession has necessitated a paradigm shift in the skill set and knowledge requirements expected from auditors. The traditional auditing expertise is now complemented by the need for proficiency in understanding AI

algorithms, data analytics, and interpreting AI-driven insights, which demands a continuous upskilling effort, development, and improvement on the auditor's side. With the integration of IT audit tools and audit software packages, ethical considerations and professional values within the auditing profession have been brought to the forefront. Questions regarding the ethical use of AI, potential algorithm biases, and the impact on professional judgement and independence have sparked discussions among South African auditors, prompting reflections on their core professional values.

The role of auditors is undergoing a metamorphosis in response to the incorporation of AI systems. From mere compliance checkers, auditors are becoming strategic advisors, leveraging AI-generated insights to provide valuable recommendations and foresight to clients and stakeholders. A plethora of impacts and implications come with the use and integration of IT audit tools into the auditor's work process, unravelling the nuances of this technological integration and its consequential effects on the auditing profession. Through empirical insights and experiential narratives, this dissertation can illustrate the complexities and opportunities arising from this transformative era in auditing. Considering this, it has become evident that proactive measures are imperative to navigate the changes in the South African audit profession.

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APPENDICES

APPENDIX A: INTERVIEW SCHEDULE

Interview Schedule

An Investigation into the Changing Workplace of South African Auditors and their Experiences of Artificial Intelligence (AI) Systems and the Implications for the Auditing Profession

My name is Noluthando Y. Phasha, and I am a student at the University of Pretoria, doing my Masters in Industrial Sociology and Labour Studies. I would like to interview you regarding your occupation and the audit software packages you work with. This is to get an in-depth understanding of your experiences with the packages. The information gathered from this interview will be used to add a valuable contribution to the scientific body of knowledge in the Social Sciences, and new technologies and how they are changing professions and workplaces. This information may be used for further research.

Aim:

This research study and interview aim to analyse the experiences of auditing professionals in utilising Artificial Intelligence (AI) systems. It is to understand whether auditors perceive that they have the necessary skills and knowledge to keep up with the introduction of Artificial Intelligence systems and if they can upskill themselves going forward.

Objective:

The objectives are to assess the usefulness of the audit software packages to the auditor and the risks and benefits that the introduction and implementation of Artificial Intelligence systems (i.e., auditing software packages) have on the auditing profession through the eyes of the auditor. To evaluate the implications of audit software packages and how they shape the world of auditing, and what this could mean for the future of the auditing profession, evaluate the moral and ethical implications of these auditing software packages. Lastly, to evaluate whether auditors will be able to upskill themselves.

Discussion Points:

It will be based on your occupation and experiences with the Artificial Intelligence (AI) systems (audit software packages) you work with. The topics of discussion will be: The Changing Nature of the Audit Profession, AI Systems and their Usefulness in the Audit Process, AI Systems and their Contribution to Audit Quality in the Audit Process, and The Future Profile of Auditing and Training.

Estimated Length and Duration of the Interview:

This interview should take approximately 30-45 minutes of your time. Please email me at noluthando.phasha09@gmail or call me on 063 235 5015 if you have any further queries.

I hope that you are available to answer the questions I have; it would be greatly appreciated.

The Changing Nature of the Audit Profession

- *These questions assess the auditors' experience of the gradual changes that are taking place in the audit profession and their workplaces. It is to see how the audit profession has been influenced and changed since the introduction of Artificial Intelligence systems.*

1) Has your firm introduced any new software packages?
    - What are they?
    - Do you use them?
    - How did you learn to use them?
2) How have the new audit software packages affected your working life, and how do you experience your work as an auditor?
3) Are the audit software packages that you use useful? In what way?
    - Ensuring quality auditing
    - Reducing your workload
4) Would you say you have the necessary skills and knowledge to operate all the different types of audit software in your firm?
    - If yes, elaborate

- If no, elaborate

AI Systems and their usefulness in the audit process

- *These questions aim to gauge your experiences with the audit software packages you work with and their usefulness to you during the audit process.*

1. Are the AI systems (audit software packages) that you work with, easy to use?
2. Is there a perceivable difference between the AI systems, in terms of how easy each one is to use? (assisted/augmented/autonomous)
3. "What is the perceived usefulness of each AI type in auditing?"
4. On a scale of 0-10 (0 being not useful, 5 being fairly useful, 10 being very useful), how useful is each AI system in the audit process? Please elaborate on your response.

AI systems and their contribution to audit quality in the audit process

- *The questions here aim to understand how AI systems, such as audit software packages, contribute to audit quality. Additionally, how these AI systems yield results reflects your objectivity and credibility in maintaining good auditing standards.*

1) What is the recognised contribution of each AI system to audit quality in the audit process?
2) Is there a recognisable difference between the contribution of each type of AI system to audit quality and the audit process (assisted/augmented/autonomous)?
3) Which AI system types (assisted/augmented/autonomous) reflects your objectivity, credibility and maintenance of good audit standards and why?

The future profile of auditing and training

- *Here, I am trying to get insight into what auditors think the future of auditing looks like and what they think can be done in order to keep up with what is to come.*

1) Do you have the necessary skills and knowledge to keep up with the technological advancements in your profession?

2) Does your firm offer training whenever a new audit software package is introduced? If yes, is the training helpful? If not, why not?
3) Keeping your answer to Q2 in mind, what do you think the future auditing profile will be?
4) Do you think students should receive practical training on computer technologies used in the audit profession while still in tertiary education? If yes, why? If not, why not?
5) Is there anything else you would like to share with me that I did not cover?

APPENDIX B: ETHICAL CLEARANCE APPROVAL LETTER

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

15 November 2021

Dear Miss NY Phasha

Project Title:	The fourth industrial revolution (4IR): an investigation into the changing workplace of South African auditors and their experiences of artificial Intelligence (AI) systems and the implications for the auditing profession
Researcher:	Miss NY Phasha
Supervisor(s):	Prof DR Bonnin
Department:	Sociology
Reference number:	20735121 (HUM010/0921)
Degree:	Masters

I have pleasure in informing you that the above application was **approved** by the Research Ethics Committee on 15 November 2021. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely,

Prof Karen Harris
Chair: Research Ethics Committee
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: tracey.andrew@up.ac.za

Room 7-27, Humanities Building, University of Pretoria, Private Bag X20, Hatfield 0028, South Africa
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APPENDIX C: INDIVIDUAL INTERVIEW INFORMATION AND CONSENT SHEET

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

An Investigation into the Changing Workplace of South African Auditors and their Experiences of Artificial Intelligence (AI) Systems and the Implications for the Auditing Profession

Individual Interview Information and Consent Sheet

Who I am and why I am here?

Good day; my name is Noluthando Y. Phasha. I am a Masters student in the Department of Sociology at the University of Pretoria. As part of my studies, I am undertaking a research project entitled An Investigation into the Changing Workplace of South African Auditors and their Experiences of Artificial Intelligence (AI) Systems and the Implications for the auditing profession. The main aim of the project is to analyse the experiences of auditing professionals in utilising Artificial Intelligence (AI) systems. It aims to understand whether auditors perceive that they have the necessary skills and knowledge to keep up with the introduction of Artificial Intelligence systems and if they can upskill themselves going forward. The objectives are to assess the usefulness of the audit software packages to the auditor, the risks and the benefits that the introduction and implementation of Artificial Intelligence systems (i.e., auditing software packages) have on the auditing profession through the eyes of the auditor. To evaluate the implications of audit software packages and how they shape the world of auditing, and what this could mean for the future of the auditing profession and evaluate the moral and ethical implications of these auditing software packages. Lastly, to evaluate whether auditors will be able to upskill themselves.

Request for your participation

To assist me in gathering the information required to complete the project, I am requesting your permission to interview. The interview should last no longer than 30-45 minutes. On the next page, there is a place for you to sign (or make an "X" sign) indicating that you give permission for me to conduct the interview.

Please understand that you are not being forced to participate in this study, and whether to participate is yours alone. If you choose not to participate, there will be no penalties, and you will not be prejudiced. If you agree to participate, you may choose to withdraw at any time during the interview. Furthermore, if you feel uncomfortable with a question asked at any point in the interview, you are not forced to answer it and have the option to decline to respond to the question.

Your participation will cost you nothing, and there will be no direct benefits to you or additional incentives.

Confidentiality

All the information you provide in this interview will be kept highly confidential. In all dissemination of the study results, pseudonyms will be used to protect your identity or the identity of the firm for which you work or have worked. The information will only be used for academic purposes such as writing the dissertation, presenting at local and international conferences, and writing journal articles, books or book chapters. However, please note the following:

- The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Research Ethics Committee of the Faculty of Humanities and the University of Pretoria (all these people are required to keep your identity confidential).
- As per the University of Pretoria policy, your interview transcripts will be stored securely and in an anonymised format at the Department of Sociology for a maximum of 15 years.
- It is also important to note that the collected data can and may be used for future research.

Risks/Discomforts

There are no anticipated risks attached to participating in this study. But if you feel any distress, please inform the interviewer.

If you have any concerns regarding the way the interview was conducted or any other concern regarding your participation in this study, please contact my supervisor Prof Debby Bonnin via email at debby.bonnin@up.ac.za or the Postgraduate Coordinator of the Department of Sociology at the University of Pretoria, Prof Zitha Mokomane via email at zitha.mokomane@up.ac.za.

Should you require more information, you can call me on 063 235 5015 or via email at noluthando.phasha09@gmail.com. You can also contact my supervisor. If you agree to participate, then please sign the consent form attached.

Kind Regards,
Noluthando Phasha

CONSENT

I hereby agree to participate in the study entitled - _____

The purpose of the study has been explained to me, and I understand it.

I am an adult over 18.

I am participating freely and without being forced in any way to do so.

I understand that I can refuse to answer any question and that I can stop this interview at any point should I not want to continue. This decision will not in any way affect me negatively.

I understand this research project's purpose is not necessarily to benefit me personally.

Should I feel distressed, I will inform the interviewer. Information about the South African Depression and Anxiety Group counselling services has been communicated, and

I can contact SADAG 08:00-20:00, Monday to Sunday, 011-234-4837 and 24hrs Helpline 0800 456 789.

I have received the telephone number of the person to contact should I need to speak about any issues which may arise in this interview.

The researcher has made me aware that my responses will be tape-recorded and transcribed to enable her to accurately capture my experiences. The transcripts will only be viewed by the researcher and possibly her supervisor Prof Debby Bonnin. Furthermore, all tape recordings will be kept for 15 years at the University of Pretoria. All interviews and transcripts will be protected by a password.

I understand that my name will remain confidential, and the study will use a pseudonym.

I understand my rights as a research participant, and I voluntarily consent to participate in the research undertaken by Noluthando Phasha.

Name of Participant:

Signature of participant: **Date:**

Tape Recording Consent:

I am willing for the interview to be tape-recorded.

I understand the purpose of the need for the interview to be tape-recorded.

Name of Participant:

Signature of Participant: **Date:**

Information and consent forms will be made available in the participant's language of choice.