IMPACT OF ARTIFICIAL INTELLIGENCE (AI) ON AUDITING INTELLIGENCE

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DECLARATION

I declare that this dissertation that I have submitted to Dublin Business School for the award of MSc. Financial Analytics is the result of my own investigations, except where otherwise stated, where it is clearly acknowledged by references. Furthermore, this work has not been submitted for any other degree.

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ABSTRACT

This research study investigates the multifaceted impact of artificial intelligence (AI) on auditing intelligence. The rapid advancements in AI technology empower auditors with tools for processing and analyzing extensive data, enhancing audit quality. Adapting to AI's prevalence is crucial, considering its potential impact on the auditing profession. However, integrating AI comes with challenges such as data privacy, security, and ethics. AI's potential in enhancing risk assessment and fraud detection is noteworthy. Collaboration between human auditors and AI tools is crucial for responsible integration. The study employs qualitative methods, including in-person interviews, to gather insights from participants. In conclusion, AI's impact on auditing intelligence is profound, enhancing efficiency, but challenges like ethics persist. Collaboration between human auditors and AI tools is essential for navigating the evolving landscape and fostering improved audit quality, efficiency, and ethical practices. Harmonizing technology and ethics ensures a successful future for the auditing profession.

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

Artificial Intelligence (AI) is causing a revolutionary impact across industries, including auditing. The incorporation of AI in auditing intelligence has led to notable changes, such as increased efficiency, cost savings, and improved decision-making capabilities. This research intends to contribute a deeper understanding of the impact of AI on auditing intelligence, helping auditors and firms make informed decisions, and paves the way for further advancements in the field.

An event was jointly organized by ACCA (Association of Chartered Certified Accountants) and EY (Ernst & Young) in Brussels on 30 January 2019. The main focus of the event was to explore the influence of Digital and Artificial Intelligence on audit and finance professionals, and to find ways to leverage the opportunities presented by disruptive technologies. During the discussion, the participants emphasized the potential advantages of data analytics and AI in enhancing audit quality, while also acknowledging the risks associated with incorporating these technologies in the audit process. The event participants recognized the significance of digital and AI tools in meeting the changing expectations concerning audit and assurance practices. (ACCA & EY, 2019)

Prof Marleen Willekens, KU Leuven; said, ”audit opinion has behavioral aspects related to it because it involves human judgment. Whenever there is judgement there might be cognitive limitations.” In the setting of big data and analytics she admits that we do not know what artificial intelligence cognitive limitations are and suggested that we do more research on it and develop appropriate tools that audit quality can be improved. (ACCA & EY, 2019)

Research conducted by Manson et al. (2001) demonstrates that the utilization of technology in auditing is not a recent development and has proven to be effective in enhancing efficiency. This improvement has been accomplished by incorporating various information and communication technology tools, such as audit toolkits, logit models, and control templates. Additionally, Dowling and Leech (2014) have observed the usage of computer-assisted audit tools and techniques (CAATs), which include intelligent decision aids, expert systems, and audit support systems. These CAATs have been extensively documented in the literature for their applications in data testing, integrated test facility, parallel simulation, embedded audit module, and generalized audit software (Bierstaker et al.,2014).

Deloitte, EY (Ernst & Young), PricewaterhouseCoopers (PwC) and KPMG (Klynveld Peat Marvick Goerdeler) are among the largest service providers in the accounting industry— collectively referred to as the Big Four. Many of the financial and consulting services offered by these firms – such as advising on investment decisions – involve finding patterns in very large sets of data. This data is often beyond the understanding of a single person (or team of persons) and is often "noisy" and without a set format. The Big Four all seem to have artificial intelligence initiatives – and the goal of this article here is to compare and contrast their AI-related efforts (and purported results). A few of the Big Four have invested heavily in innovation labs and claim to embrace a new era of automation and augmentation. (Faggella, 2020)

Utilizing artificial intelligence (AI) during the audit procedure has yielded substantial benefits for Samantha Bowling, a CPA (Certified Public Accountant) and CGMA (Chartered Global Management Accountant), as well as for the clients she serves in her capacity as a partner at

Garbelman Winslow CPAs located in Upper Marlboro, Md. The seat of Prince George's County, Maryland United States of America. A significant portion of her clientele consists of not-for-profit organizations, each dedicated to vital public service missions. These organizations are determined to avoid becoming the next charitable entity to capture media attention due to instances of fraud jeopardizing their invaluable received donations. (AICPA & CIMA, 2022)

AI has helped Bowling and her firm perform better audits for these clients because it helps identify the areas where risk of material misstatement is largest and enables analysis of more complete sets of data and transactions. Bowling said “It’s a total game changer in the audit world,”. (AICPA & CIMA, 2022)

Technology is helping CPAs provide improved quality in almost every area of the audit. Bowling is at the forefront of a trend that has seen CPAs (Certified Public Accountants) increasingly turn toward the use of AI in various aspects of the audit. Even smaller firms such as Garbelman Winslow, which employs fewer than 20 people, are discovering tremendous advantages as they incorporate AI into their work. (AICPA & CIMA, 2022)

1.1.1 Auditing Intelligence

Auditing intelligence refers to the application of advanced technologies, data analytics, and artificial intelligence (AI) in the field of auditing

It involves using AI algorithms and data analysis tools to enhance the efficiency, accuracy, and effectiveness of the auditing process.

Auditing intelligence can assist auditors in identifying patterns, anomalies, and potential risks within financial data and transactions. .

Russell & Norvig, (2010), talk of these advance technologies as systems that possess human-like thinking abilities, systems that exhibit human-like actions, systems that engage in rational thinking, and systems that demonstrate rational actions.

The relation between Advance technologies, AI and machine learning can be illustrated in ***Figure 1***.

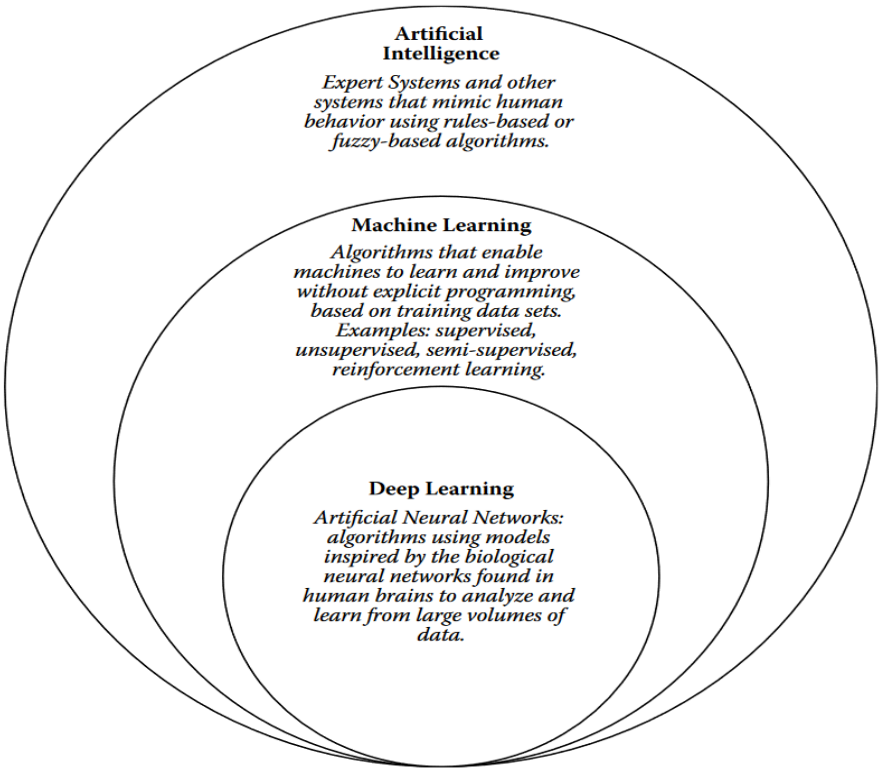


Figure 1: : Relationship between AI, ML and DL *(Ng & Alarcon, 2021)*

1.1.2 Auditing Stages

The auditing stages and audit process as shown in ***Figure 2*** and ***Figure 3*** are explained below.

1. Pre-planning stage: The auditor requests for all relevant materials/records. Arrange files and prepare for fieldwork. Ensure there is workspace for auditors. (Case western reserve university, 2023).
2. Planning stage: The engagement starts by issuing of letter of understanding and holding an entry meeting with the management team. (Office of the Auditor General Kenya, 2021).
3. Execution/fieldwork: Audit execution, collection of data/ data analytics and evidence. Issue audit queries and get feedbacks.
4. Reporting: share audit findings during the exit meeting. Issue management letter to the accounting officer of the organization. (Office of the Auditor General Kenya, 2021).
5. Follow-up: Issue Draft audit report from the responses received from the audit findings in the management letter, follow-ups on responses and evidence presented finally issue final audit report. (Office of the Auditor General Kenya, 2021).

Comprehending the auditing process allows us to assess the role and advantages of AI applications employed in auditing.

The main goal of the auditing process is to collect evidence to form a suitable opinion on an organization's financial statements

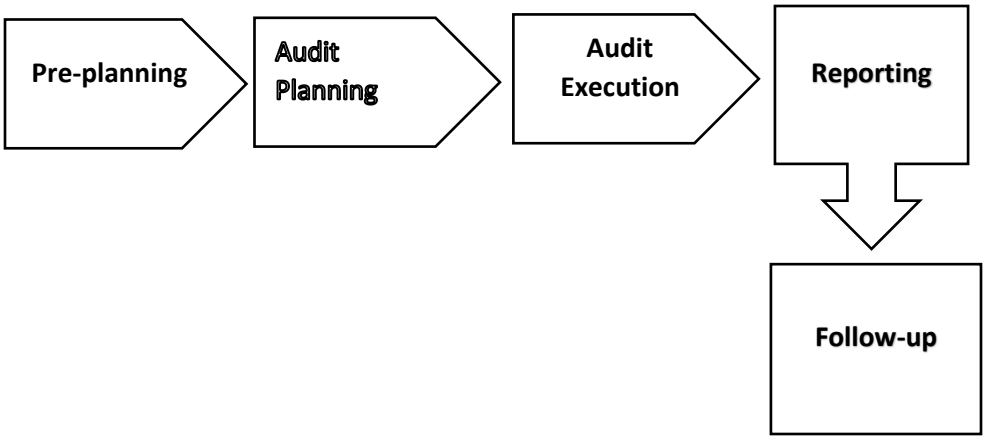


Figure 2: Auditing Stages

Figure 3: Auditing process *(Office of the Auditor General Kenya, 2021)*

1.1.3 Types of audits focused on

This research will be limited to 6 types of audit from the vast types of audits that exist. These audits are as follows: Internal Audit, External Audit, Financial Audit, Tax Audit, System Audit and Compliance Audit. Examples of audits excluded include social responsibility audit, environmental audit, Quality audit and human resource audit.

Internal audit focuses on evaluating and improving internal processes, while external audit verifies the accuracy of financial statements. Financial audit ensures the reliability of financial information, tax audit checks compliance with tax laws, system audit assesses IT systems, and compliance audit ensures adherence to laws and regulations. Each type of audit serves a specific purpose in evaluating and ensuring the integrity and compliance of different aspects of an organization.

1.1.4 AI Applications in Auditing.

AI applications in auditing use AI technologies to enhance different aspects of the auditing process. These applications include data analysis, predictive analytics, natural language processing (NLP), machine learning, fraud detection, robotic process automation (RPA), continuous monitoring, cognitive technologies, audit planning, and compliance monitoring. AI enables auditors to analyze vast data volumes accurately, detect patterns and anomalies efficiently, and make informed decisions. It automates repetitive tasks, optimizes audit planning, and aids in fraud detection and compliance monitoring. As AI continues to evolve, it provides auditors with powerful tools to enhance audit quality, efficiency, and adaptability to the changing auditing landscape.

1.1.5 Artificial Intelligence

Oxford English dictionary defines Artificial intelligence as “The capacity of computers or other machines to exhibit or simulate intelligent behavior” (OED, 2023). In other words, Artificial intelligence refers to the capacity of a computer to think and acquire knowledge through learning.

AI components contribute to the development of sophisticated AI systems capable of solving complex problems, recognizing patterns, understanding and generating language, and making decisions akin to human intelligence. (Diaz, 2023).

Figure 4 lists key components of AI: Cognitive Computing, Computer Vision, Machine Learning, Neural Networks, Deep Learning, and Natural Language Processing (NLP). Cognitive computing involves AI systems emulating human thought processes and decision-making. Computer vision enables machines to interpret visual information from images and videos. Machine learning empowers systems to learn and improve without explicit programming. (Diaz, 2023)

Neural networks, inspired by the brain's structure, excel in pattern recognition and decision-making. Deep learning, a specialized form of neural networks, processes vast data and achieves state-of-the-art performance. (Diaz, 2023). Natural learning processing (NLP) enables machines to understand and generate human language, facilitating interactions through text or speech.

TURING

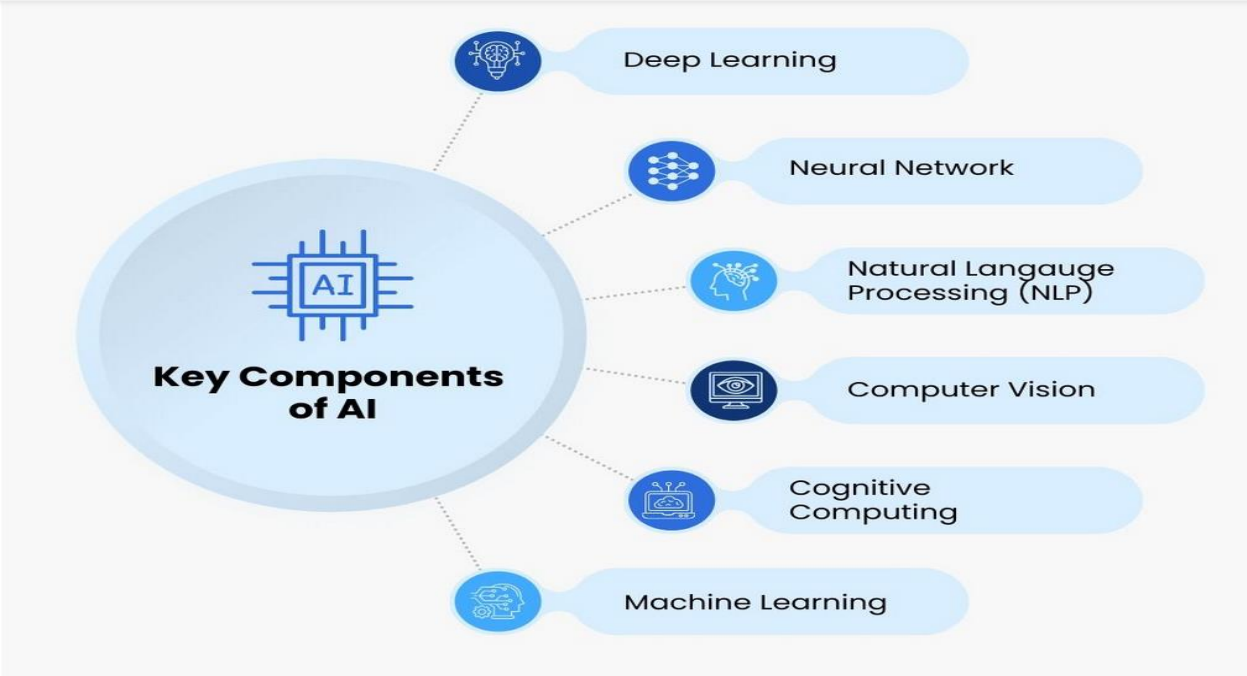


Figure 4: Key Components of AI *(Turing, 2020)*

1.2 Background/Rationale

The rationale behind this research study on the impact of artificial intelligence (AI) on auditing intelligence is multifaceted:

Firstly, the rapid advancements in AI and related technologies have equipped auditors with potent tools capable of processing and analyzing vast data volumes with unprecedented speed and accuracy. Understanding the implications of these technological strides is crucial to optimizing auditing processes and elevating audit quality.

Secondly, AI's prowess in swiftly processing extensive data leads to more efficient audits with heightened accuracy. Investigating how AI can streamline auditing procedures and enhance the

dependability of audit outcomes holds paramount importance for both auditors and stakeholders.

Moreover, in light of the growing prevalence of AI, auditors must adapt to its incorporation to remain competitive and relevant in the industry. Recognizing the potential impact of AI on the auditing profession empowers auditors to proactively cultivate the necessary skills and expertise.

However, integrating AI into auditing is not devoid of challenges. These encompass aspects like data privacy, security, and ethical considerations. Exploring these facets is indispensable for upholding trust and confidence in the auditing field.

Furthermore, comprehending AI's influence on audit quality is pivotal to ensure thorough, reliable, and more adeptly equipped audits capable of identifying anomalies, errors, and potential fraud.

AI's potential in augmenting risk assessment and fraud detection mechanisms is also noteworthy, contributing to more informed risk evaluations and improved fraud detection capabilities. This offers significant value to organizations and investors alike.

As AI becomes integrated into auditing practices, auditors' roles undergo transformation. Identifying the new skill sets and competencies required to effectively collaborate with AI technologies ensures auditors' professional growth and adaptability in the digital era.

Amid the increasing role of AI-driven audits, maintaining transparency and accountability in how AI models reach conclusions is crucial. Auditors' ability to elucidate and substantiate AI-generated results to stakeholders is imperative.

Understanding AI's impact on auditing intelligence extends beyond the profession itself, delivering advantages to stakeholders such as investors, regulatory bodies, and clients. Improved audit quality and heightened transparency provided by AI-driven audits benefit these stakeholders.

Additionally, this study opens avenues for future research and innovation. Exploring AI's impact on auditing intelligence uncovers areas where AI can further enhance auditing processes and overcome existing limitations, thereby propelling progress within the field.

In conclusion, investigating the impact of AI on auditing intelligence is indispensable for auditors, organizations, and stakeholders as they navigate the evolving landscape of the profession. This exploration facilitates the responsible and effective integration of AI technologies, ultimately fostering improved audit quality, heightened efficiency, enhanced risk assessment, and ethical considerations that uphold trust and integrity in the auditing process.

1.3 Aims and Objectives

The aim of the research on the "Impact of Artificial Intelligence (AI) on Auditing Intelligence" is to investigate the effects of AI integration in the auditing profession. The study aims to explore how AI technologies revolutionize traditional auditing practices and how they enhance auditing intelligence.

Objectives

The study will evaluate the extent to which AI technologies have been integrated into auditing processes in various firms and organizations.

The study will analyze how the adoption of AI in auditing has impacted the efficiency and accuracy of audit procedures compared to traditional methods.

The study will determine the impact of AI on the overall quality of audits, including the effectiveness of risk assessment and fraud detection.

The study will Investigate how the introduction of AI has affected the roles and skills required of auditors, including their ability to interpret and use AI-generated results.

The study will identify potential areas for future research and development in the field of AI-augmented auditing intelligence.

In summary, this research aims to provide valuable insights into the impact of AI on auditing intelligence, guide auditors and firms in making informed decisions, and pave the way for further advancements in the field.

1.4 Significance of the study

The current literature extensively explores challenges related to audit backlogs and the use of manual accounting documents. This creates a gap in research regarding practical solutions using modern AI tools to expedite audit clearances. While past studies identify issues with manual financial statement creation and its impact on audits, there's a lack of research on implementing AI to enhance audit efficiency. This gap emphasizes the need to develop methodologies using AI tools to transition traditional audits into digital formats.

This study aims to explore how AI algorithms can extract, analyze, and interpret financial data from manual documents. It aims to bridge the knowledge gap between conventional audits and AI-augmented digital audit reports. The research will also address practical challenges, benefits, and ethical considerations of AI adoption in audits. Ultimately, the goal is to enhance audit processes using AI, leading to smoother, more efficient, and faster clearances while maintaining accurate and reliable digital audit reports.

1.5 Conclusion

The introductory chapter of this dissertation presents a concise background, highlighting the research's focus on Artificial Intelligence (AI) impact, particularly its significance in the audit profession and the audit firms in general. The rationale for selecting this topic is explained, along with the specific aims and objectives of the dissertation. The next chapter dives into the literature already available on Artificial Intelligence and auditing intelligence in the auditing sector.

CHAPTER TWO:LITERATURE REVIEW

2.1 Introduction

2.1.1 AI technology in the Audit sector

This research study covers a comprehensive review of academic literature encompassing books, journal articles, and thesis that pertain to this research.

Spence. C, (2022), a professor of accounting at King's College London and co-director of the FinWork Futures Research Centre noted that the utilization of data analytics, robotic process automation, and ventures into artificial intelligence via machine learning is aiding companies in their quest for audit methods that are both more effective and dependable. These technologies have the capability to swiftly identify intricate patterns and anomalies within vast datasets, setting a new standard for speed. (Spence, 2022).

In addition to the efficiency advantages, these advancements hold the potential to enhance the quality of audits and diminish the possibilities of errors. This is especially significant in today's environment of stringent regulations and a low tolerance for audit shortcomings from the public. (Spence, 2022).

Farcane et al., (2023). highlights that the widespread of physical distancing and the prevalent practice of remote work, might necessitate a shift towards digitalization. However, the road ahead encompasses more than just conducting audits from a remote standpoint. It entails harnessing technological advancements to enhance core procedures with the objectives of achieving three key aims: a more efficient audit process, elevated audit quality, and enhanced

business insights for clients undergoing audits. In this context, it is imperative for audit firms to employ appropriate tools and methodologies to reshape the experiences of their workforce, especially considering the present importance of such transformations. (Farcane, et al., 2023).

The regulatory hurdles center around determining whether the recently facilitated identification of "outliers" within a population and the visual representations achievable through data analytics using complete corporate datasets meet the criteria for audit testing as defined by the existing framework of auditing standards. Within this framework, the auditor is mandated to carry out a risk evaluation, guiding the creation of a testing approach. This approach can then be founded on either a statistically random assortment of transactions (with subsequent cross-referencing to the source documentation) or on analytical review procedures. These procedures necessitate the auditor to beforehand establish an independent anticipation of a specific account balance, aimed at verifying the credibility of that value. Among auditors and regulatory authorities, a growing agreement seems to be emerging that this form of technology-enhanced analysis ought to be regarded as an integral aspect of risk assessment, rather than being classified as direct audit testing. (Spence, 2022).

Even so, intriguing disruptions are unfolding within the domain of audits, and these will persist for a considerable duration as companies and regulatory bodies grapple with the challenges posed by the fourth industrial revolution. (Spence, 2022).

Artificial intelligence encompasses a range of interconnected technologies such as speech and image recognition, data mining, semantic analysis, and machine learning. AI is currently in its nascent phase of being embraced for transformative societal applications. This is in part due to

the expenses associated with adopting the requisite technologies, coupled with a scarcity of technical expertise within businesses. Nevertheless, the substantial prospective benefits of integrating AI technologies justify the efforts and investments made by companies. (Emetaram, et al., 2021).

2.1.1. AI Technology Ethical Issues

The presence of bias, unfairness, lack of transparency, and accountability in Artificial Intelligence (AI) systems, along with the risk of misusing predictive models for decision-making, has prompted concerns about the ethical implications and unintended repercussions of emerging technologies across various sectors embracing data-driven innovation. (Ayling & Chapman, 2021).

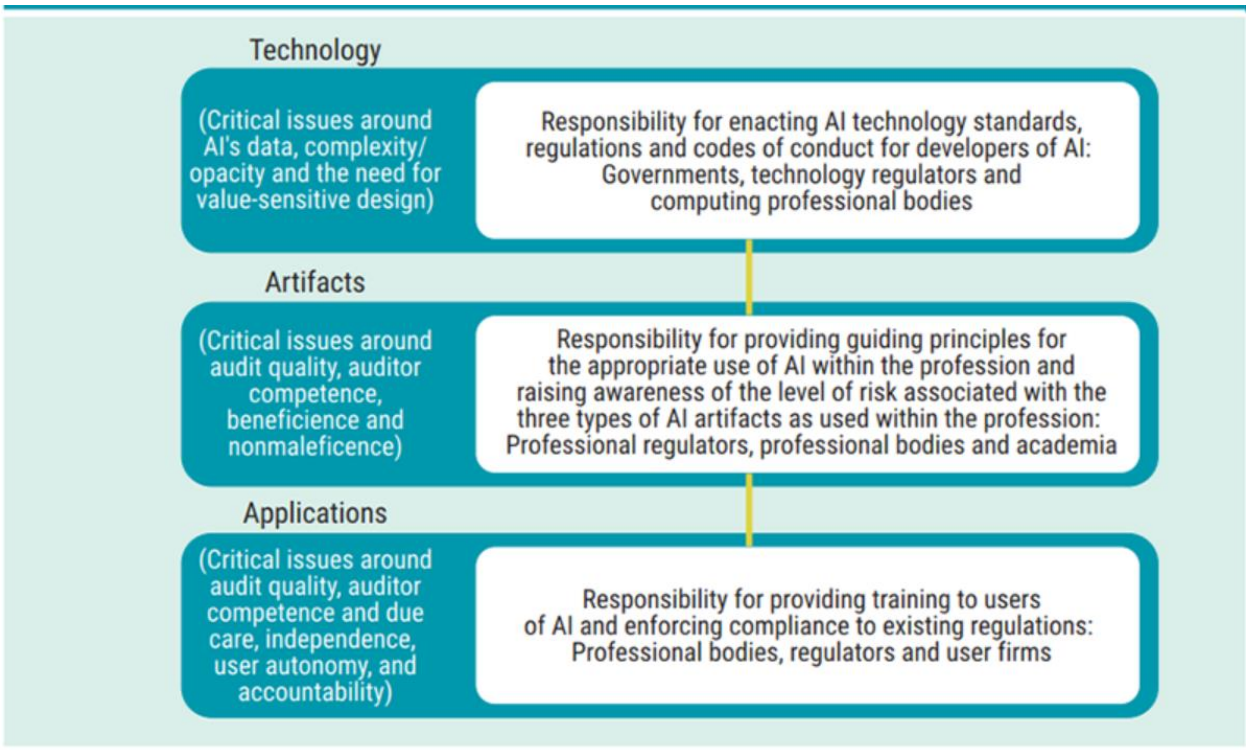
The prevalence of highly automated systems is increasing rapidly, encompassing various functions like self-driving vehicles and advanced medical diagnostics, offering numerous advantages. Nevertheless, assurance challenges have come to the forefront due to prominent crashes and incidents. To establish widespread public trust in these systems, effective governance is crucial. (Falco, et al., 2021).

Existing governance principles have been suggested to guide automated system developers inspirationally. However, their practical implementation is often hindered by excessive costs and complex processes required for enforcement. In this Perspective, an international and multidisciplinary team spanning government organizations, industry, and academia proposes an approach to address this assurance challenge: independent audit. (Falco, et al., 2021).

The suggested approach for independent audit of AI systems encompasses three essential 'AAA' governance principles: prospective risk assessments, operation audit trails, and system

adherence to jurisdictional requirements. This independent audit method offers a practical solution to address a challenging and difficult-to-enforce assurance task concerning AI systems. (Falco, et al., 2021).

Below in **Figure 5** are some of ethical implications of using AI in Auditing summarized by Ivy Munoko under ISACA- Information Systems Audit and Control Association journal.



Source: Adapted from Munoko, I.; H. L., Brown-Liburd; M. Vasarhelyi; "The Ethical Implications of Using Artificial Intelligence in Auditing," *Journal of Business Ethics*, vol. 167, iss. 3, 2020

Figure 5: Ethical implications of using AI in Auditing (Ivy Munoko, 2021)

Using AI raises ethical concerns that demand careful attention which are not limited to Privacy and Data Protection, Bias and Fairness, Transparency and Explain ability, Job Displacement and Security and Safety.

2.2 Research Review

Accounting firms are increasingly incorporating Artificial Intelligence (AI) into their auditing and advisory functions, highlighting several advantages such as time savings, quicker data analysis, higher accuracy levels, deeper insights into business processes, and improved client service. AI, an emerging technology designed to replicate human cognitive abilities and judgment, offers competitive benefits to those who adopt it. Consequently, all the major accounting firms, known as the Big 4, are embracing AI and have future plans to apply this innovation in various areas, including audit planning risk assessments, transaction tests, analytics, and the preparation of audit work-papers, among other applications. However, as the uses and advantages of AI in auditing continue to surface, there is a growing awareness that unintended consequences may also arise. (Munoko, et al., 2020).

According to Enholm et al. (2021), AI is of importance to businesses and organizations. There is a lack of a coherent understanding of how AI technologies can create business value and what type of business value can be expected (Enholm, et al., 2021).

Organizations can use AI technologies to automate tasks or augment humans, either for internal or external purposes. Internal purposes mean using AI to improve internal business processes, where the customer is not in direct contact with the AI-solution. (Enholm, et al., 2021).

AlSheibani et al., (2020) stated that added business value can be attained by AI applications leading to improved business efficiency with cost reductions having increased revenue.

The Rule of Law " By Design"? article demonstrates that technology often fails to deliver on its promises. However, a more significant concern is that when the rule of law is designed by

humans, it may lead to systemic risks and harmful outcomes. While it is true that humans, including public officials, can make errors in judgment or misrepresent past precedent, and that human judges may be influenced by biases or external factors, these issues are inherent in the rule of law. (Zalnieriute & Moses, 2021).

Yet, socio-technical systems designed by humans are not flawless solutions either. This is evident in all three case studies presented. For instance, opting for a private blockchain instead of a public blockchain undermines the accountability, transparency, and predictability that the latter is intended to achieve. Similarly, , using unverifiable, closed-source software during elections transforms random errors and inconsistencies into a more troubling systemic risk, eroding accountability. (Zalnieriute & Moses, 2021).

Eventually, any data-converting task will be automated by machines. However, certain aspects such as imagination and judgment are exclusive to humans and often define the uniqueness of organizations. AI, like spreadsheets and databases, is a valuable tool, but its effectiveness relies on people who know how to utilize it to streamline business processes. Accountants and auditors cannot be replaced by artificial intelligence when it comes to applying human creativity and making judgments. The evolution of technology, regulations, and economics will persistently challenge conventional practices and mindsets within the profession, a development that is advantageous. The manner in which audits are conducted will be shaped by the market's reaction to these transformations. Consequently, accountants and auditors need to swiftly adapt to shifts in user requirements and the emergence of novel benchmarks for organizational performance, surpassing the confines of traditional financial statements (Accounting Today, 2017).

In a literature review published by university of Dhaka, Bangladesh. Ahamed Hasan states that, despite the potential disruption AI may bring to the profession in the future, it is highly improbable that the demand for human professionals will vanish completely. Hence, as a society, it is crucial to embrace AI while ensuring that value and efficiency remain top priorities. (Hasan, 2022).

According to the research conducted by Ing. Aneta Zemankova (2019), artificial intelligence in accounting and audit shows significant promise in enhancing efficiency, minimizing errors, and granting accountants and auditors additional time to concentrate on intricate and value-added assignments, as opposed to repetitive, time-consuming, and rule-based tasks. (Zemankova, 2019).

Accountants possessing a robust technical foundation in programming languages will find themselves in an optimal position to collaborate with data scientists when it comes to implementing AI initiatives. For self-reliant accountants who aim to tailor AI technologies to address specific applications, acquiring proficiency in a programming language would prove immensely beneficial. Competence in widely-used open-source programming tools for AI, such as Python and R, will empower accountants to personalize AI applications according to the distinct operational requirements of their respective firms or clients. Additional resources like SQL and NoSQL will prove valuable in extracting, modifying, and managing data intended for utilization in AI applications. (Ng & Alarcon, 2021).

Numerous aspects of artificial intelligence still warrant further research, including the analysis of costs and benefits associated with AI projects, the extent to which audit judgment can be

automated, and the adequacy of audit populations as samples for deep learning. (Issa, et al., 2016).

2.3 Conclusion

There are few published articles on artificial intelligence in auditing even so it is still evident that artificial intelligence is currently in place as organizations strive to find alternatives and solutions on risks that come with inception of AI in audit forms. More research are encouraged to establish AI unbiased judgement on issuing an audit opinion. The following chapter pertains to the methodology, outlining and discussing the research techniques and approach employed in this study.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The research study uses a qualitative research design utilizing in-person semi-structured interviews to gather data. The interview assess respondents' agreement or disagreement, views or opinions on statements relevant to the research objectives.

Qualitative research revolves around the collection and analysis of non-numerical data, such as text, video, or audio, to gain an understanding of concepts, opinions, or experiences. It serves the purpose of delving deeply into a problem or generating novel research ideas. (Bhandari, 2020).

Qualitative research involves examining the perspectives of participants during data collection, analysis, and presentation in order to address the research inquiries. (Plano Clark & Creswell, 2015).

3.2 Participants

The researcher used Purposeful sampling to pick participants. The population frame are auditors and employees in the auditing sector who are the key participants in this study to collect relevant and insightful information to the study. The researcher is an auditor hence convenient to get auditors and collect the relevant data.

For qualitative data gathering, purposeful sampling is employed to select individuals based on their direct experience with the central phenomenon. (CRESWELL, 2009).

The population frame in qualitative research refers to the specific group of individuals or sources of data that are relevant to the research question and can provide meaningful insights into the phenomenon under study. (CRESWELL, 2009).

Stratton, (2021) states that convenience sampling is a non-probability method often used in clinical and qualitative research. It involves selecting available participants, like those at a hospital or from a database, making it easy and quick. (Stratton, 2021).

Quantitative researchers often overlook the value of studying small samples due to a misconception that achieving generalizability is the primary objective of high-quality research. This misconception has led to some well-founded qualitative studies incorporating inappropriate sampling techniques. (Marshall, 1996).

An appropriate sample size for a qualitative study is one that effectively addresses the research question. For straightforward queries or detailed investigations, this size could be small. (Marshall, 1996). The researcher opted for 5 participants with sufficient experience in auditing sector hence making the data collected valuable and very resourceful for this research.

Marshall, (1996) states that an appropriate sample size for a qualitative study is one that adequately answers the research question. The researcher collected the data from 5 participants as shown in **Table 1** who are auditors and employees within the auditing profession in various audit firms both in the republic of Ireland and Kenya. It was relevant to have participants entirely in audit field of profession to be able to collect reliable and up to date information on matters of artificial intelligence and auditing intelligence in the auditing sector.

Table 1

Participants Designation	**Participants**	**Years of Experience**
Senior Information System Auditor	**1**	8 years
Principal Auditor	1	18 years
Senior Auditor I	1	6 years
Audit Associate I	1	6 years
Assistant registrar: Audit & Compliance	1	5 years
Total participants	**5**	

The participant selection and recruitment targeted auditors and audit firms/departments. The interviews are audio recorded for accurate data capture, and these audio recordings serve as the primary source of data. Subsequently, the collected data is be transcribed for further analysis.

The selection process employs theoretical sampling, encompassing both auditors and management personnel from various audit firms and departments

The recruitment of participants was facilitated through convenient accessibility channels. Leveraging the researcher's professional background as an auditor, participants were reached out to via colleagues as well as other auditors from diverse organizational contexts. Contact was be established through a combination of phone calls and emails to initiate communication and request participation.

Additionally, The researcher considered the geographical location of participants. Depending on distance, the choice between face-to-face interviews and remote interviews conducted via phone was made. This flexible approach aimed to accommodate participants' preferences and ensure optimal engagement and data collection. Through these participant selection and recruitment strategies.

3.3 Design

The study collection of qualitative data was through in-depth interviews which involves semi-structured conversations with participants. The interviews were audio recorded and later used to write transcripts. Participants who were not willing to be recorded agreed to the documentation of the interview. Document analysis proves indispensable, enabling the extraction of valuable information from both tangible published records and digital resources. In amalgamation, these approaches provide a rich tapestry of qualitative data, enriching the depth and authenticity of the research.

3.4 Materials &/ Apparatus

This research aims to provide valuable insights into the impact of AI on auditing intelligence, guide auditors and firms in making informed decisions, and pave the way for further advancements in the field.

This research wants to learn about how AI affects auditing. It also wants to help auditors and companies make smart choices. The research summarized questions asked are as follows:

What AI technologies for auditing do you know about or use?

Is it important for auditing companies to change because of AI? Why?

Can AI give fair audit opinions even though humans usually do this?

What will the future be like for audits and AI?

Are people worried that auditors might lose their jobs because of AI? What are these worries?

What skills should auditors have now to be good at their job with AI?

Are there rules about using AI in auditing? Do these rules care about being fair?

What problems might happen if AI is used for audits in companies?

What tools can help companies switch from doing audits by hand to using computers? How can AI make audits quicker and better?

What troubles are there now when AI is used in audit companies?, What parts of auditing and AI have not been studied much?

Is it hard for governments or public companies to pay for AI tools in audits? How can this problem be made easier?

What is it like to use AI in audits? Would you tell others to do it? Why?

What do you think about AI's impact on audits and audit tools overall?

3.5 Procedure

The research process involves a structured procedure for contacting participants and gathering primary data. The nature of the study employs a semi-structured interview approach to address the research questions. Ethical considerations was carefully managed, with a focus on maintaining confidentiality through the signing of participant consent forms.

The research was guided by the following steps:

1. Initiate the process by sending requests to potential participants, outlining the study's purpose and seeking their participation.

2. Upon receiving acknowledgments and agreement from interested participants, distribute consent forms and information sheets via email for their signature.

3. Arrange and conduct interviews with participants at mutually convenient times within specified deadlines.

4. Request additional details and seek approval from participants to use their information in the dissertation and for academic purposes.

5. After data collection, proceed to analyze the gathered results and discussions to draw meaningful conclusions from the data.

Through this structured procedure, the research effectively engaged with participants to gather insightful data, and contribute valuable findings to the study of AI's impact on auditing intelligence.

3.6 Ethics

The ethical conduct of research is of paramount importance to ensure the well-being and rights of participants, the integrity of the research process, and the credibility of research findings. This chapter outlines the ethical considerations, principles, and procedures that guided this qualitative analysis research conducted for this dissertation.

The researcher made certain that ethical standards were upheld, with a primary focus on ensuring anonymity and confidentiality in the study. Participants engaged voluntarily and were informed that they had the freedom and right to discontinue their involvement in the research at any point.

Legal and ethical considerations constitute a crucial element of contemporary research, pertaining both to the subject under study and the researchers involved. (Yip, et al., 2016)

The researcher ensured to get views of the participants on their expectations on the outcome of the study just to be more respectful and considerate of participants' feelings and perspectives.

To ensure transparency and trust the researcher secured signed consent forms from participants and ensuring they are fully informed about the research's objective and aims. This ensures rights of the participants are safeguarded.

3.7 Data Analysis

This study focuses on Thematic analysis approach to analyze qualitative data collected.

Thematic analysis is an approach used to analyze qualitative data, where the researcher carefully examines the data to identify recurring patterns and themes in the meaning conveyed. This method involves an active process of reflexivity, wherein the researcher's subjective experience plays a central role in interpreting and making sense of the data. (Villegas, 2023).

Thematic analysis involves the process of recognizing, examining, and presenting patterns (known as themes) found within data. (Braun & Clarke, 2006)

The process of data analysis for this study follows a systematic and thorough approach, ensuring the comprehensive exploration of the collected data. Initially, data familiarization involves immersing oneself in the audio content. The subsequent step of initial coding entails attaching concise labels or tags to segments of data to capture meaning, encompassing descriptive, interpretive, and emotional dimensions.

Themes are then sought through the grouping of related codes, unveiling patterns, repetitions, and variations. Thorough review of these potential themes involves examining code relationships within each theme and refining them to accurately encapsulate the data's essence. Clear and meaningful names are assigned to the themes, each being defined by its core characteristics.

Themes are then mapped, organizing their relationships and hierarchies, ensuring coherence and understanding. The ongoing process includes revisiting and refining themes as needed for clarity. Descriptive narratives are developed for each theme, employing data excerpts to provide illustrative context. Patterns and trends emerging from the themes are analyzed to discern broader implications and meanings.

Interpretation and integration contextualize the themes within a larger framework, drawing connections to existing theories or concepts. The findings are reported methodically, summarizing the analysis process, decisions, and insights coherently. Rigor is maintained through transparent documentation of analytical decisions and potential peer review for validation. This meticulous data analysis process ensures a robust and meaningful exploration of the collected information.

3.8 Conclusion

In conclusion, the purposeful sampling methodology chosen for this qualitative research has been pivotal in shaping the depth and breadth of our exploration. By deliberately selecting participants based on their direct experiences and unique perspectives related to the central phenomenon, the researcher have cultivated a sample that offers rich insights and a comprehensive understanding of the research subject. This approach aligns with the qualitative nature of our study. Through purposeful sampling, the researcher ensured that the participants possess the knowledge and insight necessary to shed light on the complexities of the phenomenon. The intentional selection process has allowed us to capture diverse perspectives and a range of contexts, contributing to the authenticity and richness of the data. This methodology also acknowledges the uniqueness of each participant with different years of experience in auditing sector, recognizing their individual contributions to the collective narrative that will emerge from this analysis. The next chapter are the results, discussions and conclusions according to the methodology described and the objective of the research.

CHAPTER FOUR: RESULTS

4.1 Introduction

The results chapter is a crucial phase in our qualitative interview research, where participants' voices and experiences take center stage. This chapter summarizes in-depth interviews, showcasing participants' thoughts and insights. Its aim is to present themes, patterns, and meanings from our qualitative data analysis. By exploring participants' responses, the researcher seek to clarify the complexities of our research questions. Subsequent sections will reveal significant findings, deepening our understanding of the studied phenomenon. Using a qualitative approach, the researcher intend to capture diverse experiences, contributing to ongoing discussions and inspiring future research in the field. By using NVivo 12 on the interview results the research was able come up with the word cloud as shown on **Figure 6**

Figure 6: Word Cloud

4.2 Research Questions

a. What auditing AI (Artificial Intelligence)Technologies are you familiar with / which Auditing AI technology have you used or are currently using?

Participant 1,participant 2,participant 4,and participant 5 have experience with Auditing AI technologies while participant 3 was not familiar to any auditing AI technology but had heard of another auditing firm planning to acquire these tools.

Figure 7 shows these auditing AI technologies used by the participants which include: ACL Analytics, Data analytics tool, IDEA Data analytics software, KPMG Clara, Pentana audit work system, RPA-Robotics process automation and TeamMate+ Audit.

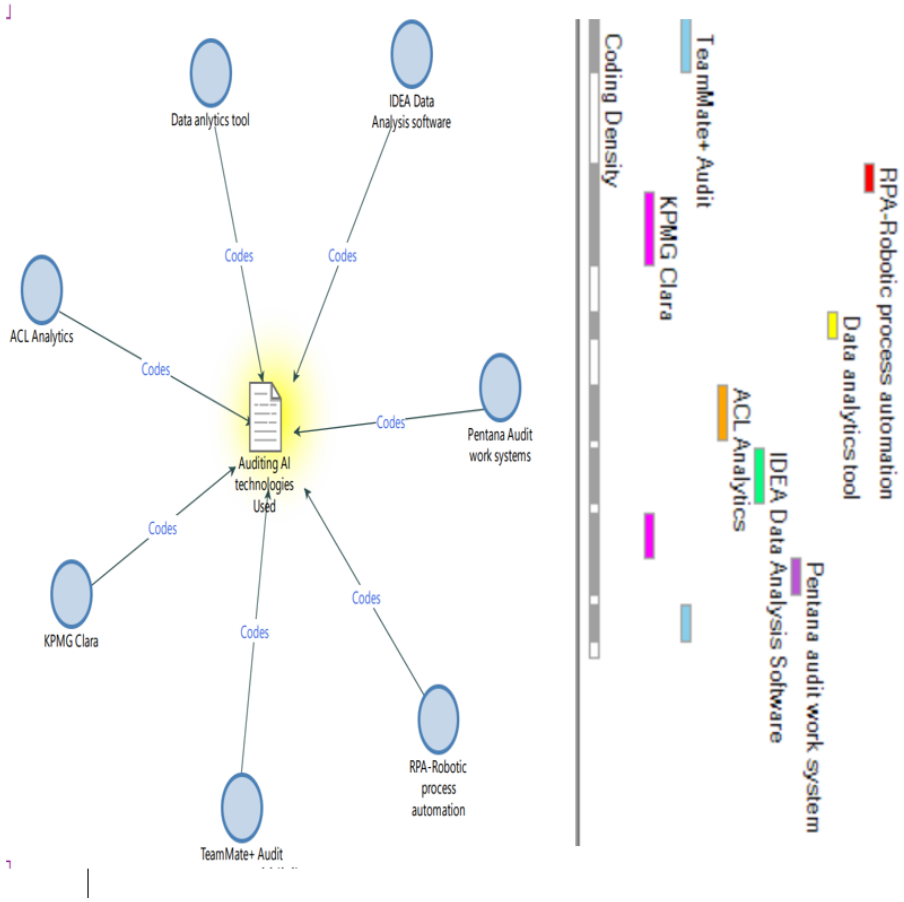


Figure 7: Auditing intelligence used

b. Do you think it is essential for auditing firms to transform and adapt to AI technologies?, why?

All participants agreed that it is essential for all auditing firms to adapt to auditing AI technologies.

AI's significance in auditing is emphasized by participants who highlight its multifaceted benefits. It enhances the auditing process, especially for routine analytics tasks, through

efficient automation. AI's role in risk assessment is crucial, leveraging historical data to forecast future trends. By reducing costs and focusing on high-risk areas, AI aids strategic planning. Another participant notes that AI's efficiency contrasts with time-consuming documentation-based audits, which demand extensive resources. Others concur that AI's application extends beyond auditing, permeating commerce and industry. Repetitive auditing processes align with AI's pattern recognition abilities, yielding accurate outcomes. Moreover, AI aids risk management, materiality calculation, and data analysis, allowing efficient resource allocation. Participants also agree that AI-driven transformation is essential for auditing firms, automating tasks like data analysis and anomaly detection. This shift towards AI fosters competitiveness, delivering higher-quality audits in less time and ensuring industry relevance.

c. Given audit opinion requires human judgement, Do you think AI is up to task to give unbiased audit opinions?, Why do you think so?

Participants hold nuanced perspectives on AI's role in auditing, expressing both positive and negative viewpoints.

Participant 1 emphasizes that AI's output is based on its training data, cautioning against potential misinterpretations. However, they also argue that AI is unbiased and reliable.

Participant 2 believes that AI can provide accurate opinions due to lack of bias, unlike human auditors who might be influenced by client relations. Yet, notes AI's limitation in foreseeing future events.

Participant 3 disagrees, asserting that AI lacks reasoning and cannot produce unbiased opinions, requiring human auditors' intervention for reliable results in repetitive tasks.

Participant 4 presents a mixed stance, acknowledging AI's capability in data analysis but asserting that final judgments demand human expertise.

Participant 5 offers a dual perspective. The participant acknowledge AI's support in automating tasks and analyzing data but assert that AI cannot replace human judgment, ethical considerations, handling unstructured data, adapting to novel situations, maintaining skepticism, or engaging in effective interpersonal communication.

In conclusion, participants recognize AI's potential benefits in auditing, such as automation and data analysis, yet emphasize the irreplaceable value of human judgment, ethical assessment, contextual understanding, and communication skills in forming unbiased audit opinions.

d. What is the future like, on matters audit and AI technology initiatives?

Participants share optimistic perspectives on the future of AI in auditing:

Participant 1 believes that the future is AI-driven due to its ability to work independently. The participant acknowledge both advantages and disadvantages, noting that AI's self-sufficiency might lead to job redundancies. Large firms, especially tech companies, are investing in AI for a competitive edge.

Participant 2 sees a bright future where AI will dominate auditing tasks within the next 5 to 10 years. While AI can handle practical aspects, humans will still be essential for decision-making and forming opinions.

Participant 3 predicts a close integration of AI tools in auditing, emphasizing ongoing research and development. The participant anticipate a relatively quick adoption of AI in auditing, consolidating individual AI-powered tasks under proper guidelines.

Participant 4 envisions AI's substantial role in internal audit, aiding risk management, resource allocation, and enhancing service quality. They highlight AI's potential in assisting auditors with regulations and accounting treatments, ultimately improving their offerings.

Participant 5 underscores the promising potential of AI in reshaping the audit profession. Anticipating collaboration between AI tools and human auditors, they stress that while AI can automate and analyze, human judgment and understanding remain indispensable for unbiased audit opinions. This integration will require ongoing learning and adaptation among auditors.

Overall, participants envision AI as a transformative force in auditing, with an emphasis on collaboration between AI tools and human expertise.

e. Are there any fear on auditor layover due to adaptation of these AI tools? What are these fears?

Participants express a range of opinions regarding the potential for AI to replace auditors:

Participant 1 acknowledges the possibility of AI replacing certain aspects of human auditors, such as judgment and critical thinking, while highlighting ethical and societal

dilemmas. The tension lies in increased efficiency versus the risk of rendering auditors redundant.

Participant 2 envisions a future where AI might replace manual tasks in auditing, but emphasizes that new opportunities and roles will emerge, requiring specific skills. They also express concerns about complacency and the need for ongoing learning.

Participant 3 sees a divided outcome, suggesting that auditors who embrace AI will thrive, while those resistant to change could be replaced by AI tools they don't understand.

Participant 4 believes AI will simplify auditors' work, allowing them to focus on tasks requiring human intervention, ultimately enhancing the profession.

Participant 5 acknowledges auditors' fears about AI adoption, including job displacement, loss of professional judgment, biases in AI algorithms, ethical dilemmas, inadequate training, and competitive pressure. They stress that these challenges can be mitigated through education, training, and thoughtful integration of AI, maintaining human aspects while utilizing AI as an enhancing tool.

Overall, the participants' views reflect a mixture of optimism, concerns, and considerations regarding the future relationship between auditors and AI.

f. What are the essential skills at the moment that auditors should equip themselves with to be more efficient in carrying out audit in these era of AI technology?

Participants offer insights into the skills and qualities auditors need to navigate the changing landscape of AI integration:

Participant 1 emphasizes a mix of soft and hard skills. Soft skills involve effective communication and basic tech handling. On the hard skills side, auditors should learn programming languages like Python and R, understand data cleansing and preparation, and grasp how to automate tasks. Staying current with evolving tools and systems is essential for staying relevant.

Participant 2 underscores the importance of following rules and requirements, enabling auditors to make informed and reliable human judgments based on a strong foundation.

Participant 3 stresses that auditors need to appreciate the value of data, as AI's accuracy and speed depend on quality data. Equipping themselves with data analytics skills and general knowledge about AI will aid auditors in understanding and accepting AI tools.

Participant 4 highlights the significance of analytical and data analytics skills, enabling auditors to interpret AI-generated results and make well-informed judgments.

Participant 5 provides a comprehensive list of skills: a robust understanding of data concepts, proficiency in technology tools, ethical judgment in AI usage, commitment to continuous learning, and expertise in data validation and quality control.

In summary, auditors need a blend of technical proficiency, data analytics skills, ethical awareness, and adaptability to effectively integrate AI tools into their profession.

g. Are there regulations in place in the auditing sector on AI technology implementation? /What are some of these regulations? Do they address matters on ethical concerns?

Participants provide insights into the regulatory landscape surrounding AI in auditing:

Participant 1 points out existing regulations such as GDPR, NIST, and ISO standards that address data privacy, AI privacy, and ethical concerns. These regulations offer guidelines on what AI tools can and cannot do.

Participant 2 hasn't encountered specific regulations on the topic yet.

Participant 3 highlights the absence of regulations in Kenya, making it challenging to implement AI in public auditing due to manual requirements. Lack of guidelines for AI usage hinders its adoption.

Participant 4 notes the lack of explicit regulations on AI tools in auditing but emphasizes the relevance of existing data protection laws and professional ethics, which require confidentiality and data protection.

Participant 5 identifies key regulatory aspects:

- International Standards on Auditing (ISA) and International Ethics Standards Board for Accountants (IESBA) provide general ethical and professional guidance for auditors.
- GDPR focuses on data protection and privacy, impacting auditors using AI tools.
- Industry-specific regulations may exist, particularly in sectors like finance.
- Local jurisdictional regulations vary and might address ethical concerns around AI use in auditing.

These insights underscore the importance of both general and technology-specific regulations for auditors using AI tools.

h. What are the emerging risks in the auditing firms on audit quality by using AI technology?

Participants outline various emerging risks associated with the use of AI in auditing:

Participant 1 highlights the risk of bias resulting from incorrect data inputs leading to inaccurate outcomes. They also stress the importance of human judgment in maintaining audit quality.

Participant 2 discusses reputation risk, exemplifying how AI might misinterpret scenarios due to pre-set criteria, potentially causing compliance issues and competition disadvantages.

Participant 3 notes that AI tools are susceptible to cybersecurity risks, including data breaches, cybercrime, and malware attacks, which could compromise the accuracy and security of audit data.

Participant 4 cautions against overreliance on AI, emphasizing the risk of assuming it can address all audit challenges. Relying too heavily on technology might lead to misleading conclusions and incorrect opinions.

Participant 5 points out data privacy and security risks associated with AI tools due to their reliance on large datasets. Mishandling or exposing sensitive information could lead to legal and reputational consequences.

These insights underscore the need for auditors to be cautious of biases, cybersecurity threats, and potential over-reliance on AI tools in their pursuit of accurate and reliable audit outcomes.

i. **What are the tools available/ in place that can help firms transitioning from manual auditing to digital auditing?, How can AI be used to ensure efficiency in auditing backlog audit and reporting.**

Participants discuss various software tools and technologies that aid in manual auditing processes:

Participant 1 describes an audit management system that digitizes manual processes and allows remote access. They mention the use of enterprise resource planning (ERP) applications, business intelligence tools like Microsoft Excel, Tableau, Power BI, and Qlik Sense, which incorporate aspects of AI to aid auditing and decision-making.

Participant 2 mentions Robotic Process Automation (RPA) for automating processes and data extraction. They acknowledge that IT professionals are better suited to provide detailed insights.

Participant 3 emphasizes the ease of digitizing manual data for analysis using tools like Power BI. They mention in-house tools, such as rule-based systems, that can raise alerts for abnormal transactions. They also mention the challenge of reading handwriting in digitizing manual documents.

Participant 4 highlights AI's efficiency in handling large data and data analysis, improving audit efficiency and documentation. They do not identify specific software for manual data scanning.

Participant 5 lists various software categories, including Data Analytics Software (ACL Analytics, IDEA, Tableau), Workflow Management Software (TeamMate+ Audit), Document Management Systems, and AI-Powered Tools (KPMG Clara, Pentana Audit Work System). Participant 5 also, mention Dext Software for automating data extraction and improving bookkeeping and accounting services.

These insights underscore the importance of various software tools in streamlining auditing processes, improving efficiency, and enhancing decision-making.

j. What are the current risks that are experienced in audit firm by using AI tools?

Participants discuss various current risks associated with the use of AI in auditing:

Participant 1 mentions the risks of over-reliance on AI tools, lack of control over their analysis process, and potential transparency issues. The increasing complexity of technology might also lead to high costs. Additionally, privacy concerns arise due to auditors handling private data.

Participant 2 emphasizes reputational risk. If a Chartered Accountant (CA) signs a report based on misrepresented information, it could lead to reputational damage and even the loss of their practicing license.

Participant 3 highlights challenges including high initial implementation costs, the need for trained experts to use AI tools effectively, potential shortage of expertise, and the possibility of investing heavily in AI for minor problems.

Participant 4 echoes the risk of over-reliance on AI solutions for all challenges and emphasizes the importance of auditors having the necessary skills to interpret AI-generated results.

Participant 5 points out the risk of insufficient training, where auditors lack the skills to understand and properly utilize AI tools, potentially leading to misunderstandings and misrepresentations in audit opinions.

These insights underline the importance of cautious and informed integration of AI tools into auditing practices to mitigate potential risks and ensure accurate and reliable outcomes.

k. What are the areas not researched on in auditing profession by use of AI tools?

Participants discuss various areas that require further research and attention in the context of AI and auditing as demonstrated below ***Figure 8: Research areas***

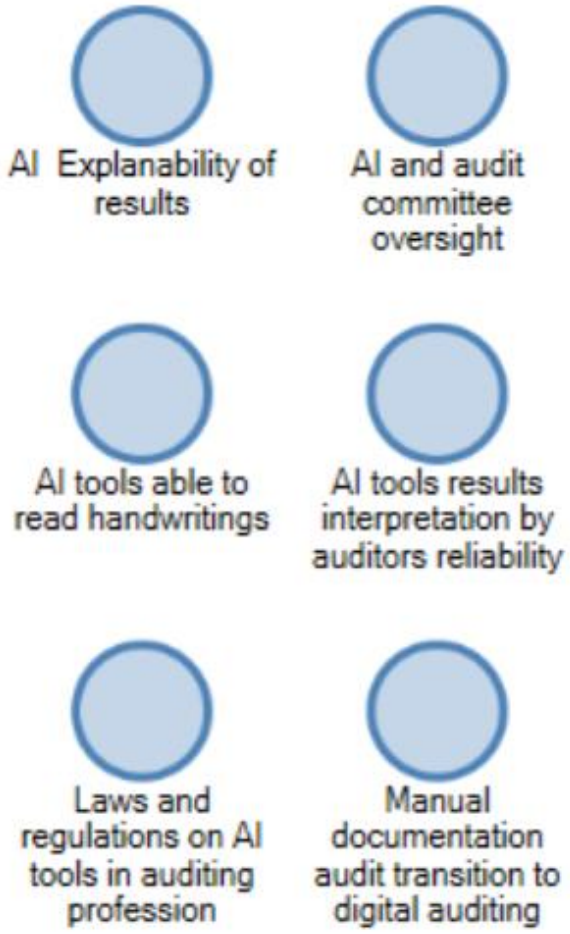


Figure 8: Research areas

Participant 1 highlights the need for clarity in laws and regulations related to AI and auditing, concerns about privacy, the potential impact on audit quality, and ethical dilemmas arising from these advancements. Continuous training and knowledge improvement are essential for auditors to maintain technical expertise in the rapidly evolving field.

Participant 2 mentions the transition from manual documented audits to digital auditing as an area of research.

Participant 3 emphasizes the challenge of reading handwritten documents in the context of public sector auditing. They point out the limitations of manual processes and the potential of AI to perform full audits without the need for sampling.

Participant 4 notes that some areas, like how accurately auditors interpret AI-generated results and the overall effectiveness of AI tools in reducing audit risks, are underexplored and could be valuable areas of study.

Participant 5 suggests research into enhancing the explain ability of AI-generated insights for auditors and stakeholders, especially for complex models like deep learning. They also mention exploring how AI can assist audit committees in their oversight role to improve corporate governance.

These insights underscore the need for ongoing research to address existing challenges, improve the effectiveness of AI in auditing, and enhance the overall quality and understanding of audit processes.

l. **Is the cost for implementing AI tools in auditing department a challenge in government/public sector? What do you think can be done to ease the burden?**

Participants discuss the challenges of implementing AI tools in auditing, particularly in government entities:

Participant 1 highlights that financial hardship is a significant challenge for implementing AI due to the substantial investment and budgeting required. Implementation may also be hindered by the need for government decisions and regulations to support the adoption of AI.

Participant 2 echoes the financial challenge, particularly in the public sector where manual documentation is prevalent. They suggest a phased approach, gradually replacing manual processes with AI tools to cut costs and improve efficiency.
Participant 3 points out that lack of proper regulations is a challenge, especially in African countries. They believe that if the benefits outweigh the costs, governments can allocate funds for AI implementation.

Participant 4 sees both sides of the issue, noting that the cost of AI may vary depending on the client's complexity and data maintenance practices. While the government can afford AI tools, their adoption depends on the client profile and the efficiency required.
Participant 5 acknowledges the cost challenge in implementing AI, especially in constrained government budgets. They suggest strategies to ease the burden, such as starting with pilot projects, investing in internal skill development, and measuring the return on investment to justify costs.

These insights underscore the complex financial considerations and various factors that influence the feasibility of adopting AI tools in auditing, particularly within government organizations.

m. What is it like using AI tools in auditing ?, would you recommend the use of AI tools? Why?

Participants provide their recommendations regarding the use of AI tools in auditing: Participant 1 recommends AI tools due to their efficiency in data analysis, time reduction, and insightful results. They highlight AI's benefits in continuous monitoring, quality assurance, and fraud detection.

Participant 2 has mixed feelings. They recommend AI tools for certain tasks but not for areas requiring human judgment.

Participant 3 strongly recommends AI tools. They emphasize that AI allows for complete audits without sampling, leading to cost savings and faster, more accurate processing compared to human efforts.

Participant 4 is positive about recommending AI tools, citing their ability to handle large data volumes, visualize data, and improve the quality of work, ultimately reducing audit risk.

Participant 5 also recommends using AI tools in auditing, acknowledging their potential to improve efficiency, accuracy, and data insights. However, they emphasize that the decision should be based on careful assessment of specific needs and resources.

These recommendations reflect the potential benefits of AI tools in auditing but also acknowledge the need for thoughtful consideration of their application based on the context and requirements of the audit process.

n. What would be your general comment on Impact of AI in auditing sector and audit system tools?

Participants provide their final thoughts and conclusions about the impact of AI in auditing:

Participant 1 emphasizes the need for research, proper funding, and a balanced understanding of the positives and negatives of AI. They believe the benefits of AI outweigh the negatives, and recommend integrating AI into auditing processes through continuous learning and skill development.

Participant 2 sees the positive side of AI in terms of cost savings and efficiency but acknowledges the fear of human auditors potentially losing their jobs to AI.

Participant 3 views AI as the future of auditing, transforming the way audits are conducted. They highlight AI's potential to predict and mitigate future occurrences, enhancing the audit process.

Participant 4 expresses optimism about the positive impact of AI in auditing and anticipates even better results as AI tools continue to improve.

Participant 5 concludes that AI's impact on auditing is transformative, enhancing efficiency, effectiveness, and the overall quality of the audit process. They also emphasize that AI is the future of auditing.

Overall, participants recognize the potential benefits of AI in auditing while acknowledging the need for careful consideration, ongoing learning, and adaptation to fully realize its advantages.

What are your expectations on this study outcome.

Participants share their expectations and hopes regarding the study on AI in auditing:

Participant 1 expresses curiosity about how AI will handle unstructured data, particularly video feeds, and hopes for integration that brings meaningful results. They also mention their interest in AI's ability to detect issues in physical judgments, like auditing roads.

Participant 2 briefly adds a comment about wanting the study to score well.

Participant 3 anticipates that the study's report could have a significant impact by informing auditors, the government, and others concerned about the auditing process. They hope that the information from the study could lead to changes in how audits are conducted in both the public and private sectors.

Participant 4 expects to learn from the final document and results of the study, hoping that it provides valuable insights into the field of audit.

Participant 5 shares the desire to see the study published and made available to all relevant stakeholders to raise awareness and contribute to knowledge about AI's role in auditing.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

In this chapter, the researcher compares the main discoveries from this research with what we learned from existing studies. The goal is to talk about and study the answers to the research questions and the issues explored in this study. The researcher will divide the chapter into seven parts, each focusing on a research question and comparing it to the information we found in the literature.

The first discussion is on the effects of AI integration in the auditing profession, addressing the research question on how AI technologies has revolutionize traditional auditing practices and how they enhance auditing intelligence. The results are discussed by auditor participants who give insightful and relevant information being their area of profession.

The second discussion is how the adoption of AI in auditing has impacted the efficiency and accuracy of audit procedures compared to traditional methods.

The third discussion is on the impact of AI on the overall quality of audits, including the effectiveness of risk assessment and fraud detection.

The forth discussion is on how the introduction of AI has affected the roles and skills required of auditors, including their ability to interpret and use AI-generated results.

The fifth discussion highlights and identifies potential areas for future research and development in the field of AI-augmented auditing intelligence.

The sixth discussion addresses the research gap on challenges related to audit backlogs and the use of manual accounting documents. Highlights solutions using modern AI tools to expedite audit clearances

Lastly, The discussion addresses the concerns regarding Integration of AI in auditing sectors.

5.2 Integration of AI tools into auditing

The researcher agrees with Spencer, (2022) that auditing sector are gradually acquiring AI tools to help leverage competitive advantage in the auditing sector as well as produce quality reports that are of standards with the voluminous data that clients keep. The impact of AI on auditing intelligence is poised to grow even further. The increasing availability of structured and unstructured data, coupled with advancements in natural language processing, will enable AI to tackle complex tasks that previously required human intervention. For instance, AI's potential to interpret unstructured data, such as video feeds or handwritten documents, could expand the scope of auditing to new domains, like assessing physical assets and environmental compliance.

Spence, (2022) A professor of Accounting at King's College London and co-director of the FinWork Futures Research Centre, highlighted the growing significance of incorporating data analytics, robotic process automation, and forays into artificial intelligence through machine learning in the field of auditing. These technologies are proving invaluable for companies aiming to improve the reliability and effectiveness of their audit methods. By swiftly detecting complex patterns and anomalies within extensive datasets, these innovations are setting a new benchmark for rapidity in auditing processes. Beyond the evident efficiency gains, these

advancements have the potential to elevate audit quality and reduce the likelihood of errors. In the contemporary landscape marked by rigorous regulations and little tolerance for auditing deficiencies from the public, these developments take on heightened importance.

Accounting firms are progressively incorporating Artificial Intelligence (AI) into their auditing and advisory functions, highlighting a range of advantages including time savings, accelerated data analysis, increased accuracy levels, deeper insights into business processes, and improved client service. AI, an emerging technology designed to replicate human cognitive abilities and judgment, provides competitive benefits to those who adopt it. Consequently, the major accounting firms, commonly referred to as the Big 4, are embracing AI and have future plans to integrate this innovation into various areas, encompassing audit planning risk assessments, transaction evaluations, analytics, and the preparation of audit work-papers, among other applications. However, as the uses and benefits of AI in auditing continue to reveal themselves, there is a growing awareness that unintended consequences might also arise (Munoko et al., 2020).

Participant 1 highlights the benefits of Teammate analytics add-on in Microsoft Excel for data cleaning and the comprehensive capabilities of the Teammate audit management system, covering auditing processes from planning to reporting. Participant 2 shares experience with RPA (Robotic Process Automation) as a tool for process automation, particularly for repetitive tasks. Participant 4 points out the significance of data analytics tools in auditing, while Participant 5 discusses various AI tools employed in the field. These include KPMG Clara, a

cloud-based platform utilizing AI for tasks like risk assessment and anomaly detection. Pentana Audit Work System streamlines auditing using AI algorithms, and IDEA Data Analysis Software aids in data visualization and fraud detection. ACL Analytics is noted for risk assessment and anomaly detection using AI techniques. Lastly, TeamMate+ Audit combines analytics and AI to enhance risk assessment, task prioritization, and overall audit efficiency.

The researcher agrees that artificial intelligence has brought about a paradigm shift in the landscape of auditing, revolutionizing how auditors approach their responsibilities. One of the most significant impacts is the efficiency AI brings to data analysis. Auditing often involves sifting through massive datasets to identify anomalies or discrepancies. AI-powered tools, armed with machine learning algorithms, can swiftly process and analyze data, highlighting irregularities that might otherwise remain buried in a sea of information. This not only accelerates the audit process but also enhances the accuracy of detecting potential issues, leading to more reliable audit opinions.

5.3 Efficiency and effectiveness of AI tools

Research conducted by Manson et al. (2001) demonstrates that the utilization of technology in auditing is not a recent development and has proven to be effective in enhancing efficiency. This improvement has been accomplished by incorporating various information and communication technology tools, such as audit toolkits, logit models, and control templates. Additionally, Dowling and Leech (2014) have observed the usage of computer-assisted audit tools and techniques (CAATs), which include intelligent decision aids, expert systems, and audit

support systems. These CAATs have been extensively documented in the literature for their applications in data testing, integrated test facility, parallel simulation, embedded audit module, and generalized audit software (Bierstaker et al.,2014).

As per the study carried out by Ing. Aneta Zemankova in 2019, the utilization of artificial intelligence in the fields of accounting and auditing holds considerable potential for improving efficiency, reducing errors, and affording accountants and auditors more time to focus on intricate and value-added tasks, rather than being consumed by repetitive, time-intensive, and rule-based activities (Zemankova, 2019).

Participant 1 expresses agreement with the enhancement AI tools bring to the auditing process, especially for simple analytics tasks through automation. AI's efficiency is noted to improve risk assessment by identifying future trends based on historical data, thus focusing efforts on high-risk areas and reducing costs. In contrast, Participant 2 points out that documentation-based audits can be time-consuming and resource-intensive, making AI tools beneficial for enhancing efficiency. Participant 3 highlights the value of AI in handling repetitive tasks by learning patterns and predicting outcomes, particularly useful for routine auditing processes. Participant 4 acknowledges AI's advantage in calculating materiality and analyzing large datasets, addressing the risk management challenge by reducing errors through AI's voluminous data analysis capabilities. Participant 5 aligns with the positive impact of AI tools, emphasizing their role in enhancing efficiency and effectiveness. Automation of routine tasks, accurate data analysis, rapid detection of anomalies and fraud, and the competitive edge gained by adopting AI technologies are cited as key benefits. Overall, participants recognize AI's potential to streamline auditing processes, reduce errors, and provide valuable insights.

The researcher agrees that the integration of technology in auditing has demonstrated its effectiveness in enhancing efficiency over time, as shown in the research by Manson et al. (2001). Various information and communication technology tools, such as audit toolkits and computer-assisted audit tools (CAATs) like intelligent decision aids and expert systems, have contributed to this improvement. Aneta Zemankova's study in 2019 highlights the potential of artificial intelligence (AI) to further enhance efficiency, reduce errors, and allow accountants and auditors to focus on value-added tasks. Several participants agree on the positive impact of AI tools in auditing. It is noted that AI can automate routine tasks, improve accuracy, and facilitate quicker detection of anomalies and fraud, ultimately providing a competitive advantage. However, concerns about the resource-intensive nature of documentation-based audits and the need for effective risk management are also raised. Overall, AI tools offer the potential to transform auditing processes by increasing efficiency and effectiveness, allowing auditors to focus on high-value tasks while minimizing errors and improving risk management.

5.4 Reliability and interpretation of AI in auditing

The researcher notes that AI's predictive capabilities have ushered in a new era of risk assessment in auditing. Traditionally, auditors relied on historical data to assess risk. However, AI's ability to analyze real-time data and predict potential future scenarios enables auditors to proactively identify risks and take preventive measures. This forward-looking approach empowers auditors to address emerging threats and vulnerabilities, ultimately enhancing the quality of audit reports and the value they provide to stakeholders.

Accounting firms are progressively integrating Artificial Intelligence (AI) into their auditing and advisory functions, underscoring multiple benefits such as time savings, expedited data analysis, heightened accuracy rates, deeper insights into business processes, and enhanced client service. AI, an emerging technology crafted to simulate human cognitive abilities and judgment, offers competitive advantages to its adopters. Consequently, the major accounting firms, commonly known as the Big 4, are adopting AI and have future plans to implement this innovation across diverse areas, including audit planning risk assessments, transaction examinations, analytics, and the preparation of audit work-papers, among other applications. Nonetheless, as the uses and advantages of AI in auditing continue to unfold, there is a growing recognition that unintended consequences may also emerge (Munoko et al., 2020).

Participant 1 emphasizes the importance of accurate data input for AI, stating that incorrect interpretations can lead to erroneous results. They also highlight the value of human judgment in maintaining audit quality, as AI might overlook certain aspects.

Participant 2 believes that AI tools primarily rely on past events for analysis and struggle with speculating about the future, limiting their ability to create a perception in certain areas.

Participant 3 discusses the limitations of AI agents, stating that their reasoning capacity and ability to make unbiased opinions are questionable. They suggest that AI can handle repetitive tasks but human auditors are needed for reliable final opinions.

Participant 4 agrees that AI can aid in data analysis and visualization, yet emphasizes that the ultimate judgment lies with human professionals. They assert that AI cannot replace a professional audit opinion.

Participant 5 acknowledges AI's support in automation, anomaly detection, and data analysis but highlights that AI lacks the ability to replace human judgment, skepticism, and contextual understanding essential for unbiased audit opinions. They mention challenges AI faces in handling unstructured data and adapting to novel scenarios. They emphasize that human interpersonal communication skills are crucial for understanding clients' businesses and uncovering potential issues, a capability AI lacks.

The researcher highlights the transformative impact of AI's predictive capabilities on risk assessment in auditing, enabling auditors to shift from a historical data-based approach to a proactive, forward-looking one. By analyzing real-time data and predicting potential future scenarios, auditors can identify emerging risks and vulnerabilities, ultimately improving audit quality and the value delivered to stakeholders. Accounting firms are progressively integrating AI into their auditing functions, yielding benefits like time savings, improved data analysis, and enhanced client service. While AI adoption offers competitive advantages and is being embraced by major accounting firms, concerns about potential unintended consequences have also arisen. Participants in the discussion further explore the nuances of AI in auditing. Some stress the importance of accurate data input and human judgment to ensure reliable outcomes, while others acknowledge AI's limitations in handling unstructured data, speculating about the

future, and replicating human judgment and interpersonal skills. Despite AI's potential, it's clear that human expertise remains essential in the audit process.

In summary, while AI can enhance auditors' capabilities, it cannot fully replicate human judgment and expertise required in auditing.

5.5 Auditors' skill development and training

Accountants who possess a strong foundational understanding of programming languages will position themselves optimally for collaborating with data scientists in the implementation of AI projects. For independent accountants aiming to customize AI technologies for specific purposes, developing proficiency in a programming language will offer significant advantages. Proficiency in widely-accepted open-source programming tools for AI, such as Python and R, will grant accountants the ability to personalize AI applications to meet the unique operational needs of their firms or clients. Supplementary skills like SQL and NoSQL will be valuable for extracting, modifying, and managing data intended for use in AI applications. (Ng & Alarcon, 2021).

Participants in the discussion emphasize the importance of a combination of soft and hard skills for auditors in the age of AI. Soft skills encompass basic communication and a modest level of tech handling ability. On the other hand, hard skills involve proficiency in programming languages like Python and R, as well as data cleansing, preparation, and analysis techniques. Continuous learning through training and seminars is emphasized. Adhering to rules and requirements is underscored by one participant as a vital aspect for auditors to provide reliable

judgments. Data analytics skills, general knowledge about AI, and analytical proficiency are highlighted as crucial by others. Understanding data concepts, being proficient with technology tools and data validation for accuracy, completeness, and relevance are also noted as essential skills for auditors. Overall, a well-rounded skill set that encompasses both technical proficiency and a deep understanding of data-related concepts is crucial for auditors in the context of AI integration.

The researcher is in agreement with Ng & Alarcon (2021),that the integration of AI requires auditors to possess a new set of skills. Traditional auditing expertise must be complemented by a deep understanding of AI technologies, data analytics, and programming languages. This shift in skill requirements calls for ongoing professional development and training, allowing auditors to stay up-to-date with the latest AI advancements and effectively leverage AI tools.

5.6 Future Research areas on AI in auditing sector

Several facets of artificial intelligence continue to necessitate additional investigation. These encompass the evaluation of the expenses and advantages linked to AI initiatives, the degree to which audit decision-making can be automated, and the appropriateness of utilizing audit populations as representative samples for deep learning purposes (Issa et al., 2016).

The study by Issa et al. (2016) identifies multiple aspects of artificial intelligence that require further investigation. These include evaluating the costs and benefits associated with AI initiatives, determining the extent to which automated decision-making can be applied in auditing, and assessing the suitability of using audit populations as representative samples for deep learning. Participants in the discussion raise several related concerns and considerations.

One participant highlights uncertainties in AI-related laws and regulations, especially concerning privacy, questioning the longevity of AI reliance and its potential effects on audit quality. Another briefly mentions the shift from manual to digital auditing. In the public sector, challenges arise from manual processes and handwritten documents, leading to reliance on sampling. AI's capacity to process all documents is noted to mitigate this sampling-related risk. The lack of research on accurate interpretation of AI tool results and their impact on audit work and risk reduction is mentioned by one participant. Another suggests research areas, including enhancing AI-generated insights' explainability and investigating AI's potential support for audit committees in ensuring better corporate governance.

5.7 AI tools that help transition from manual auditing to digital auditing.

Farcane et al. (2023) emphasize that the widespread implementation of physical distancing and the prevalent adoption of remote work may prompt a transition toward digitalization. However, the path forward involves more than just conducting audits remotely; it involves leveraging technological advancements to improve fundamental procedures, with the goals of achieving three primary objectives: a more efficient audit process, heightened audit quality, and enhanced business insights for clients undergoing audits. Given the current significance of these changes, it becomes crucial for audit firms to employ suitable tools and methodologies to reshape the experiences of their workforce in this context (Farcane et al., 2023).

Participant 1 discusses the utilization of an audit management system in their office, facilitating online automation of manual processes through TeamMate version 2020. They further mention that clients employ audit modules in their ERP applications, utilizing tools like Microsoft Excel,

Tableau, Power BI, and Qlik Sense for business intelligence and AI-supported decision-making. Participant 5 highlights a range of AI tools and software used in the auditing field. These encompass Data Analytics Software such as ACL Analytics, IDEA, and Tableau for efficient data analysis, Workflow Management Software like TeamMate+ Audit for task tracking, Document Management Systems for organized access to audit evidence, and AI-Powered Tools like KPMG Clara and Pentana Audit Work System for AI-backed data analysis and anomaly detection. Additionally, the Dext Software is mentioned, aiding in automating data extraction and enhancing accounting practices. The researcher's summary reiterates the array of AI tools currently in use, including those for data analytics, workflow management, document organization, and AI-powered analysis. The Dext Software's contribution to automating data extraction for improved bookkeeping and accounting services is also highlighted.

Farcane et al. (2023) highlight the potential shift towards digitalization prompted by the widespread implementation of physical distancing and remote work practices. This transition goes beyond remote auditing, focusing on leveraging technological advancements to enhance core procedures. The objectives encompass achieving a more efficient audit process, heightened audit quality, and improved business insights for audited clients. Given the current importance of these changes, it's imperative for audit firms to adopt appropriate tools and methodologies to reshape their workforce's experiences in this evolving context. The subsequent discussion among participants elaborates on the utilization of audit management systems, ERP applications, business intelligence tools, and AI-powered software to enhance auditing processes and decision-making. Additionally, a range of AI tools used in the field is highlighted, including data analytics, workflow management, document organization, and AI-

powered analysis, as well as tools like the Dext Software that automate data extraction to improve accounting practices.

5.8 Concerns and caution regarding AI in auditing

In a comprehensive discussion, participants offer diverse perspectives on the potential impact of AI on the auditing field. Some emphasize the need for auditors to collaborate with technology to remain relevant and navigate potential redundancies, while others foresee opportunities arising despite possible layoffs. Concerns regarding human complacency and its impact on technological advancement are voiced, and the necessity for auditors to embrace AI for survival is underscored. The study by Ahamed Hasan from the University of Dhaka highlights the improbable complete replacement of human professionals by AI, advocating for a balanced approach that prioritizes value and efficiency. The distinctiveness of human creativity and judgment is emphasized, and the evolving landscape of technology, regulations, and economics is acknowledged. Prof. Marleen Willekens ACCA & EY(2019) from KU Leuven discusses the behavioral dimensions of audit opinions due to their reliance on human judgment, suggesting further research to enhance audit quality through suitable AI tools. The researcher agrees that AI brings advantages but also ethical challenges, emphasizing the importance of maintaining ethical standards and finding the right balance between automation and human judgment. It's noted that AI is a valuable tool that complements auditors' skills, enhancing their ability to provide valuable insights and focus on tasks requiring critical thinking and interpretation.

The researcher notes that while AI offers numerous benefits to the auditing profession, it's important to note that AI is not a replacement for human auditors. Rather, it complements

their skills and expertise, enabling them to provide more valuable insights and focus on tasks that require critical thinking, judgment, and interpretation.

5.9 Conclusion

In conclusion, the impact of artificial intelligence on auditing intelligence is profound and multifaceted. AI technologies are redefining traditional audit processes, enhancing efficiency, accuracy, and predictive capabilities. However, this transformation is not without its challenges, including ethical considerations and the need for upskilling auditors. As the journey towards AI-augmented auditing continues, collaboration between human auditors and AI tools will be crucial, ensuring that AI's potential is harnessed to its fullest while preserving the essential human aspects of the auditing profession.

CHAPTER SIX: CONCLUSION

The integration of Artificial Intelligence (AI) into the auditing profession has ignited a dynamic discourse among professionals, researchers, and experts. The discussions captured in this synthesis highlight a wide spectrum of perspectives regarding the implications of AI in auditing. Participants express a range of views on AI's potential to reshape the auditing landscape, with considerations spanning job displacement, enhanced efficiency, improved audit quality, and ethical dilemmas.

Despite varying opinions, there is consensus on the transformative power of AI in auditing. While some participants express concerns about possible job redundancy, others see AI as a catalyst for innovation, offering opportunities for auditors to engage in higher-value tasks and analyses. The potential synergy between human expertise and technological capabilities emerges as a recurring theme, underlining the notion that AI augments rather than replaces human judgment.

The literature supports this synergy, suggesting that while AI can automate routine tasks and enhance data analysis, its efficacy relies on human understanding, interpretation, and ethical judgment. Ahamed Hasan's research underscores the improbable complete replacement of human professionals by AI, advocating for a harmonized approach that prioritizes value and efficiency.

Recommendations

Continuous Learning and Skill Development: The evolving landscape of AI demands that auditors and accounting professionals stay up-to-date with the latest AI technologies and tools. Investing in continuous learning and skill development is crucial to ensure auditors remain equipped to leverage AI effectively and responsibly.

Ethical AI Integration: To address ethical dilemmas, auditors and organizations must implement AI in a manner that aligns with ethical standards. Establishing guidelines for AI use, fostering transparency, and conducting regular ethical assessments can ensure that AI-powered audits maintain the integrity and professionalism synonymous with the field.

Collaboration Between AI and Human Auditors: Organizations should focus on cultivating a collaborative environment where AI and human auditors work together seamlessly. Recognizing the complementary strengths of both entities can lead to enhanced audit quality, increased efficiency, and improved decision-making.

Research and Development: As AI continues to evolve, more research is needed to understand its limitations and cognitive constraints. Initiatives aimed at enhancing AI's cognitive capabilities, interpretability, and explainability will contribute to better AI-augmented auditing practices.

Adaptability and Flexibility: To navigate the changing audit landscape, auditors should remain adaptable and flexible in their approach. Embracing new technologies, updating methodologies, and embracing emerging trends will allow auditors to remain effective in a rapidly evolving profession.

Balancing Automation and Judgment: It's imperative to strike a balance between automation and human judgment. AI can enhance efficiency, but auditors must ensure that critical tasks requiring nuanced judgment, skepticism, and contextual understanding remain firmly under human purview.

In conclusion, the integration of AI in auditing holds the potential to reshape the profession, enhancing efficiency, and augmenting the value auditors bring to the table. A collaborative approach, ethical integration, and ongoing learning are crucial to harnessing AI's benefits while safeguarding the essential human judgment that defines the audit profession. As the journey of AI in auditing progresses, aligning technological advancements with ethical considerations will be essential in charting a successful and sustainable course forward.

APPENDIX

Appendix 1: Interview Questions

DUBLIN BUSINESS SCHOOL

MSC. FINANCIAL ANALYTICS

DISSERTATION TOPIC: IMPACT OF ARTIFICIAL INTELLIGENCE (AI) ON AUDITING INTELLIGENCE

INTERVIEW QUESTIONNAIRE

STUDENT : RACHEL KEMUMA ONDEYO (10621743@mydbs.ie)

SUPERVISOR : HEIKKI LAIHO (heikki.laiho@dbs.ie)

o. What auditing AI (Artificial Intelligence)Technologies are you familiar with / which Auditing AI technology have you used or are currently using?

p. Do you think it is essential for auditing firms to transform and adapt to AI technologies?, why?

q. Given audit opinion requires human judgement, Do you think AI is up to task to give unbiased audit opinions?, Why do you think so?

r. What is the future like, on matters audit and AI technology initiatives?

s. Are there any fear on auditor layover due to adaptation of these AI tools? What are these fears?

t. What are the essential skills at the moment that auditors should equip themselves with to be more efficient in carrying out audit in these era of AI technology?
u. Are there regulations in place in the auditing sector on AI technology implementation? /What are some of these regulations? Do they address matters on ethical concerns?
v. What are the emerging risks in the auditing firms on audit quality by using AI technology?
w. What are the tools available/ in place that can help firms transitioning from manual auditing to digital auditing?, How can AI be used to ensure efficiency in auditing backlog audit and reporting.
x. What are the current risks that are experienced in audit firm by using AI tools?
y. What are the areas not researched on in auditing profession by use of AI tools?
z. Is the cost for implementing AI tools in auditing department a challenge in government/public sector? What do you think can be done to ease the burden?
aa. What is it like using AI tools in auditing ?, would you recommend the use of AI tools? Why?
bb. What would be your general comment on Impact of AI in auditing sector and audit system tools?

Appendix 2: Consent Form

Information Form and Consent Sheet

INFORMATION SHEET FOR PARTICIPANTS

PROJECT TITLE **IMPACT OF ARTIFICIAL INTELLIGENCE (AI) ON AUDITING INTELLIGENCE**

Dear Participant,

My name is Rachel Kemuma Ondeyo and I am currently conducting a research dissertation as part of Master of Science in Financial Analytics (MSc. Financial Analytics) program at Dublin Business School in the Republic of Ireland, Under the supervision of Mr. Heikki Laiho.

You are being asked to take part in a **research study On impact of artificial intelligence (AI) on Auditing Intelligence.**

Auditing intelligence refers to the application of advanced technologies, data analytics, and artificial intelligence (AI) in the field of auditing. It involves using AI algorithms and data analysis tools to enhance the efficiency, accuracy, and effectiveness of the auditing process. Auditing intelligence can assist auditors in identifying patterns, anomalies, and potential risks within financial data and transactions.

The aim of this research is to investigate the effects of AI integration in the auditing profession. The study aims to explore how AI technologies revolutionize traditional auditing practices and how they enhance auditing intelligence.

By achieving these aims and objectives, this research aims to provide valuable insights into the impact of AI on auditing intelligence, guide auditors and firms in making informed decisions, and pave the way for

further advancements in the field. This study will be published by Dublin Business School as approved by the Research Ethics Committee.

I extend a warm invitation to you to partake in this study, and I sincerely appreciate your consideration in reading this informational document. Your time and attention are highly valued.

WHAT WILL HAPPEN

In this study, you will be asked to give your views on Artificial Intelligence (AI) and Auditing technologies currently in use. Your experiences as an auditor or in the audit sector using AI technology. General views on AI and Auditing intelligence. You are allowed to disclose or not disclose the audit firm you work with or use to make references on. The results will be safely and ethically stored to maintain privacy and avoid tampering of the results.

TIME COMMITMENT

The study interview typically takes 30 minutes. This is a one-time session. After completion of the study there will be no further requirements on participants.

PARTICIPANTS' RIGHTS

You may decide to stop being a part of the research study at any time without explanation required from you. You have the right to ask that any data you have supplied to that point be withdrawn / destroyed. You have the right to omit or refuse to answer or respond to any question that is asked of you. You have the right to have your questions about the procedures answered (unless answering these questions would interfere with the study's outcome. A full de-briefing will be given after the study). If you have any questions as a result of reading this information sheet, you should ask the researcher before the study begins.

CONFIDENTIALITY/ANONYMITY

The data I collect does not contain any personal information about you except your anonymous perspective on the stated subject. The data obtained in the study will be used as part of research dissertation and may be utilized by organisations and industry professions interested in the findings as well as presentations at conferences. publication of the study is also within the aims of this project. Participants will remain anonymous.

FOR FURTHER INFORMATION

I or / and Mr. Heikki Laiho will be glad to answer your questions about this study at any time. You may contact my supervisor at Email: heikki.laiho@dbs.ie

INFORMED CONSENT FORM

PROJECT TITLE: **IMPACT OF ARTIFICIAL INTELLIGENCE (AI) ON AUDITING INTELLIGENCE**

PROJECT SUMMARY:

This study investigates the influence of artificial intelligence (AI) on the field of auditing. The research aims to evaluate how integrating AI impacts the effectiveness and precision of auditing procedures, and how it brings about changes in the roles and capabilities of auditors. The study analyzes data from multiple certified public accountant (CPA) firms that have adopted AI technologies in their auditing practices. The variables studied encompass aspects like audit quality, time efficiency, skill demands, and cost-effectiveness. The research employs a comparative approach, contrasting audits aided by AI with traditional methods. The findings highlight that AI adoption significantly enhances the efficiency and accuracy of audits, resulting in more thorough risk evaluations and improved fraud detection.

By signing below, you are agreeing that: (1) you have read and understood the Participant Information Sheet, (2) questions about your participation in this study have been answered satisfactorily, (3) you are aware of the potential risks (if any), and (4) you are taking part in this research study voluntarily (without coercion).

_____

Participant's Name (Printed)

RACHEL KEMUMA ONDEYO

Student Name (Printed)

_____

Date

Appendix 3: NVivo Thematic coding

Name	Description
Theme Impact of AI on Auditing Intelligence	
Theme 1 Integration of AI tools into auditing AI and tool utilization	Integration of AI tools into auditing AI and tool utilization
AI tools in specific Audit software	
ACL Analytics	
Data analytics tool	
IDEA Data Analysis Software	
KPMG Clara	
Pentana audit work system	
RPA-Robotic process automation	
TeamMate+ Audit	
Theme 2 Effects of AI in auditng profession	Effects of AI in auditng profession
Automation of routine tasks	
Enhance risk assessment	
Fraud detection	

Name	Description
improved accuracy and quality	
predictive analytics	
Skill evolution	
Theme 3 Auditors skill development and training	Auditors skill development and training
analytical skills	
Communication skills, basic skill in handling tech	
Data interpretation	
technology proficiency	
Theme 4 Efficiency & effectiveness of AI tools	Efficiency & effectiveness of AI tools
How AI technologies enhance auditing intelligence	
analyze huge amount of data	
Calculate materiality	
Enhances and improves auditing	

Name	Description
Faster detection of anomalies and fraud	
gain competitive advantage	
improved accuracy	
improves overall risk assessment	
Lessen auditing manpower cost	
Most auditing process are repetitive	
saves time	
Theme 5 Future Research areas on AI in auditing sector	Future Research areas on AI in auditing sector
AI Explan ability of results	
AI and audit committee oversight	
AI tools able to read handwritings	
AI tools results interpretation by auditors reliability	

Name	Description
Laws and regulations on AI tools in auditing profession	
Manual documentation audit transition to digital auditing	
Theme 6 AI tools to help transition from Manual auditing to digital	AI tools to help transition from Manual auditing to digital
AI- powered tool	
audit modules in ERP- Enterprise resource planning applications	
Auditing management system	
Data analytics softwares	
Dext software	
document management systems	
workflow management software	
Theme 7 Reliability and interpretation of AI in Auditing	Reliability and interpretation of AI in Auditing
AI's limitation in speculative Analysis	

Name	Description
Dependency on AI training, AI cannot be bias	
Garbage in, Garbage out principle	
Handling unstructured data	
Human intervention in AI-processed Data	
Professional Skeptism in AI	
Theme 8 Concerns and caution regarding AI in Auditing	Fears regarding AI in Auditing
Adaption to change	
Ethical dilemmas	
fear of human auditor Extinction	
Job Displacement	
upgrading skill sets	
Theme 9 Risks in auditing sector for using AI tools	current and emerging risks in auditing sector for using AI tools
Cybercrime risk. cyber security risk	

Name	Description
Data privacy risk	
Lack of data interpretation risk	
over-relaying on AI	
Reputation risk	
shortage of expertise risk	

References

ACCA & EY, 2019. *The impact of digital and artificial intelligence on audit and finance professionals: harnessing the opportunities of disruptive technologies.* Brussels, ACCA.

Accounting Today, 2017. *Scoping out the audit of the future.* [Online]
Available at: https://www.accountingtoday.com/news/scoping-out-the-audit-of-the-future
[Accessed 30 June 2023].

AICPA & CIMA, 2022. *Artificial intelligence is a game changer for auditors.* [Online]
Available at: https://www.aicpa-cima.com/news/article/artificial-intelligence-is-a-game-changer-for-auditors
[Accessed 12 June 2023].

Ayling, J. & Chapman, &. A., 2021. *Putting AI ethics to work: are the tools fit for purpose?.* [Online]
Available at: https://link.springer.com/article/10.1007/s43681-021-00084-x
[Accessed 1 August 2023].

Bhandari, P., 2020. *Scribbr.* [Online]
Available at: https://www.scribbr.com/methodology/qualitative-research/
[Accessed 1 August 2023].

Braun, V. & Clarke, V., 2006. Qualitative Research in Psychology. *Using thematic analysis in psychology,* 3(2), p. 79.

Case western reserve university, 2023. *Audit service: Audit plan & process.* [Online]
Available at: https://case.edu/auditservices/audit-plan-process
[Accessed 8 August 2023].

CRESWELL, J. W., 2009. *THE RESEARCH DESIGN.* THIRD EDITION ed. Los Angeles • London • New Delhi • Singapore: SAGE Publications. Inc.

Diaz, M., 2023. *ZD NET: What is AI? Everything to know about artificial intelligence.* [Online]
Available at: https://www.zdnet.com/article/what-is-ai-heres-everything-you-need-to-know-about-artificial-intelligence/
[Accessed 8 August 2023].

Emetaram, E., Uchime & N., H., 2021. Impact of Artificial Intelligence (AI) on Accountancy profession. *Journal of Accounting and Financial Management,* 7(2), pp. 2695-2211.

Enholm, I. M., Papagiannidis, E., Mikalef, P. & Krogstie, J., 2021. Artificial Intelligence and Business Value: a Literature Review. *Information Systems Frontiers (2022),* Volume 24, pp. 1709-1734.

Faggella, D., 2020. *AI in the Accounting Big Four – Comparing Deloitte, PwC, KPMG, and EY.* [Online]
Available at: https://emerj.com/ai-sector-overviews/ai-in-the-accounting-big-four-comparing-deloitte-pwc-kpmg-and-ey/
[Accessed 10 June 2023].

Falco, G. et al., 2021. *nature machine intelligence.* [Online]
Available at: https://www.nature.com/articles/s42256-021-00370-7
[Accessed 1 August 2023].

Farcane, N. et al., 2023. Auditors'perceptions on work adaptability in remoteaudit: a COVID-19 perspective. *ECONOMIC RESEARCH-EKONOMSKA ISTRAŽIVANJA,* 36(1), p. 454.

Hasan, A. R., 2022. Artificial Intelligence (AI) in Accounting & Auditing: A Literature Review. *Open Journal of Business and Management*, 29 January, p. 462.

Hasan, A. R., 2022. Open journal of Business Management. *Artificial Intelligence (AI) in Accounting & Auditing: A Literature Review ,* 10(1), p. 462.

Issa, H., Sun, T. & Vasarhelyi, a. M., 2016. J. Emerg. Technol. Account. *"Research Ideas for Artificial intelligence in Auditing: The Formalization of Audit and Workforce Supplementation.",* 13(2), pp. 1-20.

Ivy Munoko, P. C. A., 2021. *ISACA.* [Online]
Available at: https://www.isaca.org/resources/isaca-journal/issues/2021/volume-2/innovating-in-times-of-change
[Accessed 20 June 2023].

Julia Kokina, T. H. D., 2017. The Emergence of Artificial Intelligence. *How Automation is changing Auditing.* , 1 March, Volume 14 (1), pp. 115-122.

Marshall, M. N., 1996. Sampling for qualitative research. *Family Practice,* 13(6), p. 522.

Munoko, I., Liburd, H. L. B. & Vasarhelyi, M., 2020. Business Ethics. *The Ethical Implications of Using Artificial Intelligence in Auditing,* Volume 167, pp. 209-234.

Ng, C. & Alarcon, J., 2021. *Artificial Intelligence in Accounting.* 2021 Taylor & Francis ed. New York: Routledge.

OED, 2023. *online.* [Online]
Available at: https://www.oed.com/search/dictionary/?scope=Entries&q=artificial%20intelligence
[Accessed 10 JUNE 2023].

Office of the Auditor General Kenya, 2021. *The audit process.* [Online]
Available at: https://www.oagkenya.go.ke/audit-process-2/
[Accessed 8 August 2023].

Spence, C., 2022. *Technology and the brave new world of audit.* [Online]
Available at: https://abmagazine.accaglobal.com/global/articles/2020/ab-sept-2020/practice/technology-and-the-brave-new-world-of-audit.html
[Accessed 23 August 2023].

Stratton, S. J., 2021. Population Research: Convenience Sampling. *Editorials,* 36(4), p. 373.

Turing, 2020. *Complete Analysis of Artificial Intelligence vs Artificial Consciousness.* [Online]
Available at: https://www.turing.com/kb/complete-analysis-of-artificial-intelligence-vs-artificial-consciousness
[Accessed 25 June 2023].

Villegas, F., 2023. *Thematic Analysis: What it is and How to Do It.* [Online]
Available at: https://www.questionpro.com/blog/thematic-analysis/
[Accessed 1 August 2023].

Yip, C., Han, N.-L. R. & Sng, a. B. L., 2016. National Library of Medicine. *Legal and ethical issues in research,* 9(60), pp. 684-688.

Zalnieriute, M. & Moses, L. B., 2021. TULANE LAW REVIEW. *The Rule of Law "By Design"?,* 95(4), p. 1063.

Zemankova, A., 2019. *Artificial Intelligence in Audit and Accounting: Development, Current Trends,.* [Online]
Available at: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9057150
[Accessed 1 August 2023].

Alsheibani, S., Messom, C. and Cheung, Y., 2020. Re-thinking the competitive landscape of artificial

intelligence.