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The Influence of Audit Firm Culture on the Adoption of Artificial Intelligence in Audit Firms

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s AI becomes an integral part of manufacturing and service industries, traditional methods are becoming obsolete, including in the accounting profession.

This study reviews the current literature and case studies on the use of AI in auditing and highlights the following key findings:

Effectiveness: AI significantly improves the effectiveness, efficiency, and quality of audit work (Dennis, 2024).

Data Processing: AI processes large amounts of financial data for the benefit of stakeholders such as investors, management, and the general public. Implications: Digital systems that improve data integrity and accuracy are highly val-

ued, as they increase the reliability of financial statements. However, challenges include aligning AI projects with business needs, developing scalable plans, high costs, and the maturity of AI technologies (Davenport & Ronanki, 2018). Cultural change is critical, and leaders play a key role in guiding these transformations (Schein, 2010).

The purpose of this paper is to explore how culture within audit firms will impact the adoption of AI technologies.

The integration of AI into audit practices offers numerous benefits, such as increased accuracy and efficiency in data processing. By automating routine tasks, AI allows auditors to focus on more complex and strategic aspects of their

work. This shift not only improves the quality of audits, but also provides more timely and relevant insights to stakeholders.

However, the transition to AI-driven auditing is not without its complexities. Organizations must ensure that AI projects are aligned with their business objectives and that they have scalable

plans in place. The high costs associated with implementing AI technologies and the need for these technologies to mature are significant hurdles. In addition, fostering cultural change within organizations is essential, as leaders must guide their teams through this transformation to fully realize the benefits of AI in audit.

To understand the impact of audit firm culture on AI adoption in audit firms, it is essential to explore the perspectives of leadership (audit partners) regarding AI use. Additionally, examining auditors' views on AI across various phases of the audit process and assessing how the leadership tone set by audit partners influences these attitudes and perceptions is crucial.

Keywords: Disruptive Technology, Culture in audit, Audit Automation, Artificial intelligence, Intelligent automation, Digitization, The tone at top.

In today's rapidly evolving business environment, characterized by rapid economic change, global connectivity, and intense competition, organizations must adapt by adopting innovative management strategies and leveraging advanced technologies. Prominent firms such as Deloitte and KPMG have incorporated AI into their audit processes, resulting in faster data analysis and improved accuracy. This shift is part of a broader trend across industries, where digitization is disrupting traditional practices.

As AI becomes a central component of the modern workplace, the audit profession faces similar challenges. Leaders must walk a fine line: remaining passive in the midst of significant change risks obsolescence, while making hasty decisions in a chaotic environment can be equally dangerous. Automation, digitization, and AI integration are now ubiquitous, and the audit profession is no exception.

A critical question is how auditors, traditionally known for their cautious nature (Davidson & Dalby, 1993), will respond to the increasing role of AI. AI can significantly improve auditing by processing large amounts of data, such as bank statements and legal contracts, more efficiently than humans. This leads to faster account reconciliations and improved audit quality, while reducing **over testing** and enabling more targeted audit procedures (Dennis, 2024).

However, several challenges remain. AI's limitations, including its inability to perform independent actions or make ethical judgments (CPA Canada & AICPA, 2020), complicate its integration. In addition, the risk-averse nature of accountants, particularly among litigation partners, may hinder the adoption of AI. This underscores the critical role of leadership in shaping firm culture and guiding technological change.

Therefore, this paper examines how the culture within audit firms influences the adoption of AI technologies. Key research questions include understanding the impact of leadership's "tone at the top" (Alberti et al., 2022) on AI integration and the role of performance incentives. Leaders play a critical role in articulating core values and beliefs during such transitions, as emphasized by Kelly and Earley (2009) and Schein's (2010) theory of organizational culture. Schein notes that non-leaders observe how leaders set priorities, respond to crises, reward performance, and model behavior, all of which shape organizational culture.

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However, the transition to AI-driven auditing is not without its own challenges. Organizations must ensure that AI projects are aligned with their business objectives and that they have scalable plans in place. The high costs associated with implementing AI technologies and the need for these technologies to mature are significant hurdles. In addition, fostering cultural change within organizations is essential, as leaders must guide their teams through this transformation to fully realize the benefits of AI in audit. In summary, the adoption of AI in auditing is a complex process influenced by several factors, including

In summary, the adoption of AI in auditing is a complex process influenced by several factors, including firm culture, leadership, and the inherent challenges of AI technology. By addressing these factors, audit firms can successfully integrate AI and enhance their audit practices.

Background

Historical Context of AI Development: In its early days, the term "artificial intelligence" was coined in 1956 by computer scientist John McCarthy in his quest for research funding. However, it wasn't until the mid-2010s that the term was significantly redefined to describe large-scale algorithmic decision-making systems and predictive machine learning models trained on massive datasets.

During and after the Cold War, AI researchers focused primarily on so-called "symbolic AI," which emphasized logic, numerical computation, and formal reasoning while largely ignoring data from every day and military activities. In contrast, more empirical approaches such as neural networks and pattern recognition were criticized.

Interestingly, a paradigm shift toward learning from data, known as the "irrational effectiveness of data (p. 1360)," became dominant. Our current AI landscape owes much to this empirical strand of inquiry, with machine learning systems grounded in real-world data now capable of tackling complex tasks like medical diagnosis and personalized advertising with a nuanced understanding of human experience. Understanding AI's past is critical to making informed decisions as we continue to shape its future (Jones, 2023).

AI and Auditing:

Growth and Integration: According to Sutton et al. (2016), although there was a temporary slowdown in the late 1990s, research in AI within accounting has shown consistent growth over the past three decades. The authors highlight the active utilization of AI techniques in integrated audit support systems and advocate for further research to explore the usability and adoption of AI methods in accounting areas. They emphasize the continued vibrancy and promising future of this field.

Before delving into the literature review, it's crucial

to establish clear definitions of both culture and AI. This initial step is driven by our interest in understanding how culture, particularly as manifested in the tone set by leadership, impacts the adoption of AI.

Defining culture and its influence:

The question of the definition of culture has been debated by many scholars. I'd like to highlight some interesting definitions found in academic literature. Spencer-Oatey (2008) defines culture as a broad set of fundamental assumptions, values, life orientations, beliefs, policies, procedures, and norms of behavior that are shared within a group of people. These cultural elements influence the behavior of individual members and their interpretations of the meaning behind the actions of others, although they do not completely determine individual behavior.

Hofstede et al. (2010) posited that culture holds significance due to its role in conditioning the collective mindset of individuals within specific groups. It serves as a distinguishing factor between individuals in one group and those in another (Prescott & Vann, 2015).

On the other hand, Gill (2013) defines culture as a collective framework that includes shared knowledge, beliefs, practices, attitudes, and artifacts within a social group. According to Gill, the cultural contexts to which individuals are connected significantly shape their behavior. In addition, previous studies of organizational performance have underscored the significant role that culture plays in influencing overall organizational performance.

Sawhney (2021) characterizes culture as the fundamental essence of an organization, akin to its DNA. It encompasses shared values, goals, attitudes, and practices that define a workplace. Culture is evident in people's behavior, interactions, decision-making processes, and work habits, influencing various aspects of individuals' experiences, happiness, and career trajectories within the organization.

According to Alberti et al. (2022), culture within audit firms is defined as the collective framework of shared values, beliefs, norms, and practices that guide the behavior and interactions of individuals within the organization. It includes both formal and informal elements that shape auditors' perceptions of their roles, decision-making processes, and interactions with colleagues and clients. Alberti et al. (2022) emphasize the importance of setting a positive tone at the top to cultivate a strong and ethical culture within the audit firm that prioritizes quality and ethical behavior.

Artificial Intelligence in Auditing

Definitions and Core Concepts: According to Newell and Simon (1972), early and prominent fig-

ures in the field of artificial, the term "artificial intelligence" refers to technology that enables computers and machines to emulate human intelligence and problem-solving abilities. Their creation of the Logic Theorist program in 1956 marked a significant milestone as the first intentionally designed AI program and laid the foundation for subsequent advances in AI research and applications. At its core, AI is the development of systems capable of performing tasks that typically require human intelligence, either autonomously or in conjunction with other technologies. These tasks include reasoning, decision making, language comprehension, perception, and problem solving. By replicating human cognitive functions, AI seeks to improve efficiency, automate processes, and solve complex challenges in various domains.

AI encompasses the utilization of computational and engineered systems to construct an intelligent engine or computer. This system exhibits characteristics akin to human cognition, learning, and autonomous decision-making. Additionally, it possesses the capability to analyze extensive datasets and autonomously arrive at high-quality conclusions (Griffin, 2019).

According to Cassidy and Hittner (2024), Generative AI (GenAI) technology has the potential to revolutionize accounting and financial reporting by enhancing the effectiveness of professionals in tasks such as planning, research, and product development. While GenAI will not replace human judgment and experience, it will enable professionals to improve quality and provide strategic insights. Hood (2021), on the other hand, suggests that using AI for complex functions such as risk assessment, analytical procedures, and valuation can improve financial reporting decisions. However, the extent of this improvement depends on how management and auditors view AI as a credible source of information and allow AI outputs to influence their decisions.

Although AI presents substantial advantages, organizations must navigate a balance between harnessing its benefits and mitigating its potential risks. Successful AI adoption in financial reporting hinges on proper implementation, ethical considerations, and effective risk mitigation strategies (Smith et al., 2023). The potential changes brought about by AI in auditing could involve a transition to a different culture. As for this study, it refers to the adoption of AI in the audit firm culture.

Theoretical Framework

Figure 1 outlines a comprehensive model for studying audit firm culture. It is derived from the Albert et al. (2022) model, which focuses on analyzing the firm, industry, and engagement levels (including national contexts), but also considers top-down influences such as national identities and network cultures. In my case, it is how audit partners' attitudes

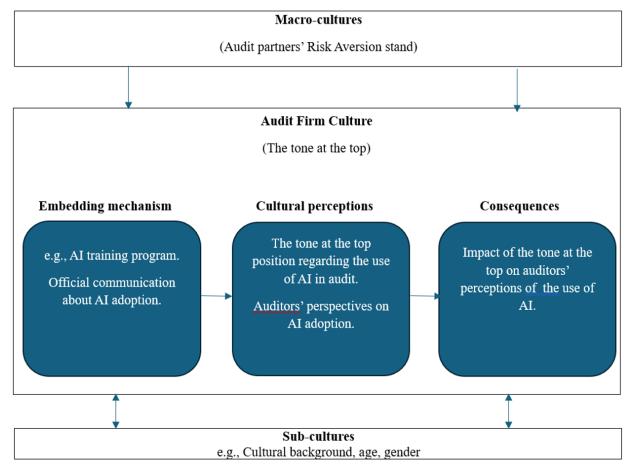


Figure 1. Adapted from the theoretical model of Alberti et al. (2022).

toward AI adoption influence auditors' perceptions of the use of AI at different stages of the audit process, and how auditors' perceptions of the use of AI at different stages of the audit process are influenced by audit partners' attitudes toward the use of AI at different stages of the audit process. In addition, the model takes into account subcultures in terms of individual characteristics such as gender, age, and professional rank/experience, which may have an impact on cultural conclusions and outcomes (Alberti et al., 2022). The model aims to explore the potential effects resulting from the adoption of AI in auditing, it acknowledges that organizational cultures are influenced by both external factors (referred to as "macro-cultures") and internal factors (referred to as "sub-cultures") that may lie beyond direct management control (Martin, 2002; Schein, 2017).

In 2015, the International Forum of Independent Audit Regulators (IFIAR) emphasized the significance of audit firm culture. According to the International Auditing and Assurance Standards Board (IAASB) in 2014, audit firm culture significantly impacts auditors' values, ethics, attitudes, mindset, and their approach to performing responsibilities.

As a result, regulatory bodies recommend that audit firms define a clear vision for their desired firm culture, aligning it with their organizational vision and core values. The IAASB identifies key attributes of an audit quality culture:

- Establishing Leadership Tone: Ensuring that the leadership sets the right tone at the top.
- Quality-Driven Evaluation and Rewards: Împlementing evaluation and reward systems that prioritize audit quality.
- Balancing Financial Considerations: Managing financial aspects without compromising auditing quality (e.g., budget constraints and time limitations).
- Investing in Professional Development: Providing opportunities for ongoing education and expert support.
- Encouraging Open Dialogue: Cultivating a culture where challenging matters are openly discussed. Audit firm culture has also drawn attention during public oversight inspections in the past (e.g., FRC, 2018; PCAOB, 2018).

This theory is considered foundational due to its relevance to culture change and its connection to

disruptive technology and workplace culture transformation.

Summary and gaps in the literature:

The literature shows a growing interest in the role of AI in auditing, with significant advances in AI-powered tools and a strong emphasis on the importance of audit firm culture. However, gaps remain in understanding how specific cultural factors within audit firms influence AI adoption and how the tone of leadership at the top influences auditors' willingness to adopt new technologies. This study aims to address these gaps by exploring the intersection of AI adoption and audit firm culture, providing insights into how cultural dynamics shape the integration of AI into audit practice.

Literature Summary

First and foremost, it is important to understand the audit process aimed at evaluating whether an organization's financial statements are free of material misstatements and can therefore be relied upon by stakeholders. Almufadda and Almezeini (2022) outline key stages and considerations: 1) Initial As-

Protocol

Selection Criteria and Process:

A comprehensive literature review was conducted, focusing on the intersection of AI, auditing, and organizational culture. Over 45 articles were initially selected, primarily from Google Scholar and a university library database to ensure access to high-quality, peer-reviewed research. The search criteria focused on articles and books published on relevant topics such as "AI and auditing," "AI and culture," and "auditing and culture."

Each article, or relevant sections, was summarized with the research question in mind. A thorough review was conducted, retaining constructs that were clearly explained and strongly supported the research question, specifically the impact of AI on culture in the auditing profession.

Inclusion Criteria:

Relevance to the Research Question: Articles were prioritized if they directly addressed the impact of AI on culture within the auditing profession. This included studies on AI adoption in auditing, cultural implications of AI integration, and the role of leadership in shaping organizational culture during technological transitions.

Publication Date: Preference was given to recent publications, particularly those from the past decade, to capture the latest developments and trends in AI technology and its implications for the auditing profession. Seminal works and foundational theories in AI and organizational culture were also included to provide a broad theoretical background.

Peer-Reviewed Sources: To ensure credibility and academic rigor, only peer-reviewed journal articles, books, and conference papers were included.

Diversity of Perspectives: Efforts were made to include a variety of perspectives, including theoretical frameworks, empirical studies, and case studies, to provide a holistic view of the topic.

Exclusion Criteria:

Irrelevant Focus: Articles that did not specifically address the intersection of AI, auditing, and culture were excluded.

Lack of Empirical Evidence: Articles lacking empirical support or primarily opinion pieces without a strong theoretical foundation were excluded.

Redundancy: Duplicate articles or those with overlapping content were removed to streamline the review process.

Potential Biases and Limitations:

Search Platform Bias: Reliance on Google Scholar and a university library database may have introduced selection bias, potentially missing relevant publications in less accessible or proprietary databases.

Language and Regional Bias: The review primarily included articles published in English, potentially excluding relevant research in other languages. The focus on Western academic sources may have limited the inclusion of perspectives from non-Western contexts.

Confirmation Bias: There is a risk of confirmation bias in selecting articles consistent with the research question. To mitigate this, a wide range of perspectives were intentionally included.

Publication Date Limitation: Emphasis on recent publications may have excluded older studies with significant theoretical value. Efforts were made to include foundational work where appropriate, but the primary focus on recent research may limit the historical perspective on the topic.

Addressing the Research Question:

The selected articles specifically address the research question by examining the extent to which AI is expected to affect culture within the auditing profession. The review synthesized constructs and findings that were clearly explained, strongly supported, and directly relevant to understanding the cultural implications of AI integration in auditing. The retained articles provided both theoretical insights and empirical evidence to construct a comprehensive analysis of how AI might reshape organizational culture, particularly in audit firms.

sessment: In the pre-planning stage, auditors evaluate whether to accept a new client, factors considered include the company's internal procedures and policies. This step establishes the foundation for the audit engagement. 2) Strategic Planning: During the planning phase, auditors assess the level of audit risk for the company. They determine the overall audit strategy, including scope, nature, and timing of audit procedures. Effective planning ensures efficiency and successful execution. 3) In-Depth Understanding: Execution involves gaining comprehensive knowledge of the client. Auditors assess the client's nature, historical context, and internal control processes. Transaction and documentation tests provide evidence to support the audit opinion, sometimes involving interviews with company personnel. 4) Leveraging Internal Audit Work: Auditors may utilize work produced by the company's internal audit department. While this can streamline the audit process, rigorous assessment of the quality and reliability of internal audit work is essential before relying on it. 5) Final Reporting: The last phase includes several activities: a) Holding a closing meeting with management, b) discussing audit findings, c) drafting a report for review, d) preparing a corrective action plan, e) finalizing the audit report.

Auditing, traditionally perceived as a labor-intensive, subjective, and sometimes monotonous process, is now at the crossroads of digital transformation. Given the pervasive impact of technology on IT professionals, it's crucial to delve into how the next wave of artificial intelligence (AI), natural language processing (NLP), and machine learning (ML) techniques can revolutionize the audit profession. These advancements hold the promise of enhancing efficiency, accuracy, and decision-making in the auditing domain (Menon, 2021).

Table 1 lists the findings of the peer-reviewed articles and their sources. These findings highlight the key points that support the positive or negative impact of AI on auditing.

Data mining provides substantial benefits to assurance and compliance functions, including fraud detection, assessing business health, and supporting forensic accounting tasks (Amani & Fadlalla, 2017), and the transformative potential of AI in auditing highlights both opportunities and challenges. Auditors must navigate this evolving landscape to effectively use AI while maintaining professional judgment and ethics (Almufadda & Almezeini, 2022). The discourse surrounding the emergence of the Fourth Industrial Revolution foresees significant disruptions in various work domains in the near future. Indeed, technology is expected to enhance auditors' judgment and, over time, even automate certain aspects of their work (Samiolo et al., 2023).

For Chartered Professional Accountants (CPAs) and Certified Public Accountants (CPAs) providing audit and assurance services, staying abreast of technological advances in our increasingly data-driven world is paramount. The impact of these changes is already being felt, as auditors and the companies they audit are increasingly embracing next-generation technologies (CPA Canada & AICPA, 2020).

The future of auditing is expected to involve significantly reduced human-to-human interaction for repetitive and rule-based tasks. Interface tools may automatically share real-time information with external auditor AI tools, enabling them to analyze, test, and flag anomalies or issues that warrant auditor attention. This shift would concentrate human interaction on high-risk transactions rather than routine inquiries (CPA Canada & AICPA, 2020).

Table 1: Literature Review Findings			
Source	Findings	Method	
Almu- fadda and Almezeini (2022)	Major AI applications in auditing enhance effectiveness, efficiency, and quality of audit work. Internal considerations before adopting AI in auditing are crucial for successful implementation.	The authors conducted a comprehensive liter- ature review, analyzing relevant academic	
	Debates exist regarding AI's impact on current hiring practices and job security for auditors.	papers and studies.	
Vitali and Giuliani (2024)	Some auditors believe that new technologies will allow them to focus on value-added activities. Views differ on whether digital tools will alter the traditional	A qualitative approach, conducting a thematic analysis of academic literature.	
	structure of auditing companies. Future auditors are expected to acquire IT and data analytics skills.	academic merature.	
	Emerging technologies may either widen or slightly reduce the gap between large and smaller auditing firms.		

CPA Canada and AICPA (2020)	Audit management must be able to comprehend, interpret, and defend the findings of AI. The auditor must review the controls and procedures surrounding AI audit. Auditors must become more knowledgeable about data science, as well as data administration and machine learning technologies. Auditors and the companies they are auditing are embracing the latest technological advances more strongly than ever before. A change in auditors' mindsets is needed to address the possibilities and difficulties of this development. Immediate issues are data security and sensitivity, information consistency, liability, and the operations of an audit. Lack of confidence in AI is possibly the most significant obstacle to the broad acceptance of AI in the auditing processes. Indirect concerns involve the ability of the auditors to perform the audit engagement.	A collaborative study that examines the impact of automation and artificial intelligence (AI) on the audit profession. In particular, it focuses on how these technologies are changing the role of auditors.
Dennis (2024)	AI can revolutionize the auditor's approach to data gathering and testing. AI processes large data sets. Implementing AI tools can involve significant costs. Firms may need to tailor the use of AI technology based on individual client needs. AI may not be suitable for all audit clients or situations.	An analysis of executive perspectives on the adoption of artificial intelligence for audit transformation, including insights into their strategies for overcoming barriers to AI adoption.
Hintz (2023)	Accounting conservatism reflects less risky accounting choices.	The study uses a unique sample that includes hand-collected data. The author uses skewness as a proxy for accounting conservatism and tests three hypotheses.
Noordin et al. (2022)	AI could play a role in helping to enhance how auditors and other parties communicate and collaborate.	Quantitative research approach. The author collected data through an online survey from local and international audit firms in the United Arab Emirates (UAE). Participants includ- ed audit managers, audit partners, senior auditors, and other ac- counting and auditing professionals.

Amani and Fadlalla (2017)	What AI means for the future of the audit industry. AI enables analytic performance and efficiencies in auditing procedures. The importance of data mining is recognized by major professional accounting organizations. Data Mining is considered to be one of the ten most important technologies of the coming years. Data mining is considered one of the top research areas. Executives rank Big Data and Data Mining as a top ten enterprise focus.	The study is an investigation of the utilization of data mining techniques in accounting and it presents an organizational framework to categorize these applications.
Carlin (2019)	Companies view AI through business capabilities, not technology. Three key AI business needs: process automation, insight through data analytics, and customer and employee engagement. Setbacks or failures in the most ambitious AI projects Instead of replacing human capabilities, companies should focus on augmenting them. Organizations need to develop a portfolio of projects to prioritize based on the needs of the company and draw up enterprise-wide roll-out plans.	The methodology of the study can be classified as qualitative. It is an exploratory study that seeks to understand and explore a relatively unexplored area.
Fedyk et al., (2022)	AI will enhance the quality of audits, lower fees, and eventually replace human auditors.	A quantitative research approach. The authors leveraged a unique dataset of more than 310,000 detailed individual resumes for the 36 largest audit firms to identify the employment of AI workers within the auditing sector.
Griffin (2019)	AI will enhance the quality of audits, lower fees, and eventually replace human auditors. AI's impact on the workforce will take several years. The evidence that AI can make companies more efficient is still inconclusive. Concerns that today's world could be replaced by an AI-based automated system. Accountants must adapt to the ever-changing business environment. Accountants and accounting firms should keep abreast of continuous improvements in AI.	A review focusing on the application of AI in Accounting and Auditing. It employs a semi-systematic or narrative review approach to analyze relevant published books and journals in this area.

Daven- port and Ronanki (2018)	Improve the features, functions, and performance of enterprise products. Streamline internal business processes. Free workers to be more creative by automating tasks. Make better decisions. Create innovative products. Streamline outside processes such as marketing and sales. Enter new niches. Capture scarce knowledge and apply it where needed. Reduce headcount through automation. The big worry with cognitive technologies is that they will put large numbers of workers out of a job. The use of AI has the potential to render more valuable and less costly information-intensive sectors such as finance, education, and services to society.	A qualitative analysis of existing literature and case studies. The review uses a semi-systematic or narrative approach to analyze pertinent published books and journals on this subject.
Grabner et al. (2019)	There are several tools that companies can employ to make it more likely that all members of an organization share its norms and values. To create consistency of purpose, people and culture reviews seek to reduce the variation in the differences in preferences of members of the company.	A qualitative research methodology involv- ing a comprehensive review of existing literature.
Fullan and Ballew (2003)	If we understand change better, we will better understand it (not control) it for better.	A qualitative analysis of existing literature and case studies.

As a disruptive technology, AI is increasingly being explored by auditors, but they may not be fully realizing all the benefits it can offer. In audits, AI can play multiple roles, such as performing journal entry testing to detect unusual transactions in large volumes of unstructured data and analyzing those transactions for patterns and anomalies. It's also instrumental in audit planning and risk assessment. It processes large data sets such as bank statements and legal contracts much faster and more accurately than human auditors, enabling them to go beyond traditional methods and improve audit quality by efficiently analyzing client information and identifying risks (Dennis, 2024).

According to Davenport and Ronanki (2018), the broader adoption of AI in the accounting and auditing profession is expected to bring significant benefits in terms of increased efficiency, productivity, and accuracy. However, it also brings challenges such as the potential elimination of traditional jobs and the need for a more skilled workforce. Additionally, incorporating cognitive initiatives alongside existing operations is also a challenge, often due to perceived high costs and the relative immaturity of AI technologies. As a result, there is a risk of overselling these technologies in the market. The same is true for the transformative potential of AI in auditing, highlighting both opportunities and challenges. Auditors will need to navigate this evolving landscape to make effective use of AI while maintaining their professional judgment and ethics (Almufadda & Almezeini, 2022).

There are also specific direct and indirect challenges associated with the use of AI in auditing. These include concerns such as privacy, confidentiality, data integrity, the accountability of AI-driven results, and the operational management of the audit process. Indirect challenges relate to ensuring that auditors have the necessary competence and skills to effectively perform audit engagements in the context of AI use (CPA Canada & AICPA, 2020). Thus, the development and integration of AI in accounting and auditing is dual in nature, presenting both opportunities and challenges. The exact outcomes will evolve over time, but it is certain that the accounting and auditing profession as we currently understand it is poised for significant change in the days ahead (Dennis, 2024).

In the same way, Samiolo et al. (2023) assert that in the eyes of numerous auditors from major auditing firms, the adoption of automated working papers signifies a substantial shift. It impacts not only how auditors allocate their time but also influences the way junior auditors acquire auditing skills. This traditional learning process is now encountering technological challenges due to automation and other advancements. As technology evolves, auditors must adapt to these changes and find new ways to navigate the audit landscape.

Almufadda & Almezeini (2022), in their study published in the Journal of Emerging Technologies in Accounting, explore key inquiries regarding AI's role in auditing. They argue that AI techniques facilitate tasks like textual data analysis, context understanding, predictive analytics, anomaly detection, and pattern recognition, significantly improving audit quality, data analysis efficiency, evidence gathering, risk assessment, and fraud detection. Their research underscores important considerations for auditors contemplating AI adoption, including decision-making processes, implementation strategies, and achieving a harmonious balance between human judgment and AI-driven insights. Additionally, they highlight the growing integration of AI technologies within the audit operations of major accounting firms, particularly the Big 4. Meanwhile, Vitali & Giuliani (2024) examine the impact of robotic process automation (RPA) and artificial intelligence (AI) on audit firms. Their research uncovers differing perceptions among auditors about the future landscape of audit firms, including changes in organizational structure, recruitment strategies, and competitive dynamics between Big 4 and non-Big 4 firms.

In summary, the existing research indicates that integrating AI into auditing offers significant advantages, including increased efficiency and enhanced precision. However, this adoption also comes with challenges. Many audit organizations lack clarity on which technologies serve specific purposes, struggle to prioritize engagements based on organizational needs, and face difficulties in creating comprehensive deployment plans.

Discussion

The Auditing Standards Board (ASB), which is responsible for issuing standards, guidance, and opin-

ions related to auditing, surveyed small and midsize firms in late 2022 to determine how to overcome barriers to the adoption of AI in auditing. Their goal was to identify any barriers to the adoption of technology, specifically artificial intelligence (AI), in the audit process.

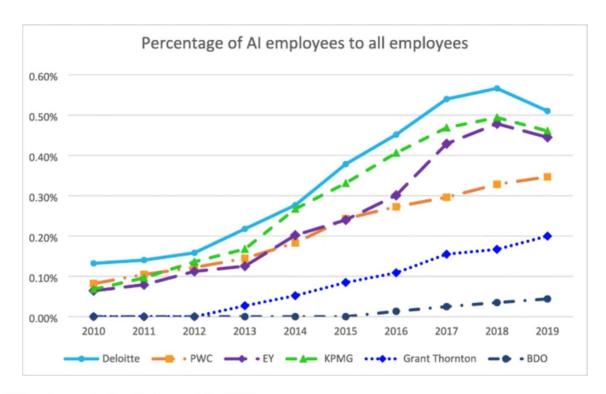
The results are summarized in Table 2, "Reasons Audit Teams Do Not Use Artificial Intelligence."

To overcome barriers to integrating AI into audit processes, firms can take proactive steps, starting with securing leadership support and conducting research and development (R&D) audits. Firm leadership, regardless of size or structure, must fully grasp the value of AI technology and understand the costs associated with not adopting it. Commitment from leadership is crucial to embracing this transformative approach and investing significant financial resources into digital transformation. This commitment underscores the practical applications of AI and emphasizes the importance of implementing necessary changes in training and infrastructure (Dennis, 2024).

As highlighted by Dennis (2024), it is imperative that educators, regulators, and professional organizations adequately prepare students, policymakers, and future professionals for the challenges posed by emerging technologies such as big data, blockchain technology, artificial intelligence, and other innovations driving the Fourth Industrial Revolution. Academic institutions need to rethink the accounting curriculum to align with these evolving technologies. Regulators must implement transformative policies to adapt to the changing landscape. Similarly, professional organizations must rethink their professional development and training processes to cultivate the skills needed in this new era.

Table2: The top reasons firm cited for not incorporating AI technology into their audits. Source: AICPA Auditing Standards Board Technology Task Force				
Reason	Percentage of survey respondents			
Lack of training and infrastructure	23%			
Technology is too expensive	17%			
Technology is not useful	17%			
Inability to access usable client data	13%			
Technology is difficult to use	12%			
Inadequate client controls for data integrity	4%			
Concerns about GAAS allowing the technology	4%			
Client data privacy or security concerns	4%			
Concerns about GAAS allowing the technology	3%			
Technology's output is too difficult to use	2%			
Lack of knowledge about technology	1%			

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AI Employees in the Six Largest Audit Firms

Figure 2. The steady increase of specialized technical skills in the audit field. Source: Fedyk et al., (2022). Is artificial intelligence improving the audit process?

The literature review highlights a significant draw-back faced by audit firms: the scarcity of specialized technical skills. Fedyk et al. (2022) confirm that the percentage of staff specializing in AI within the six largest auditing companies—Deloitte, PwC, EY, KPMG, Grant Thornton, and BDO USA—remains quite low. However, there has been a consistent upward trend over the past decade, particularly noticeable among the Big 4 firms as shown in figure 2.

Figure 2 shows a continuous increase in the percentage of AI professionals - from 0.08% in 2010 to 0.39% (or 0.37%) in 2018 (2019) (Fedyk et al. 2022). These results are systematically reinforced by the data in Figure 3, which presents statistical information for all audit firms and is highlighted below.

When examining the share of AI workers in different sectors, as documented by Babina et al. (2020), the share of AI professionals in audit firms is particularly substantial-slightly below that of the computer science sector and exceeding the share in all other sectors (as per NAICS 2-digit industry codes). This underscores the strategic importance of AI in both the short- and long-term plans of accounting firms. In the face of numerous challenges, including a shortage of AI-enabled audit staff and a risk-averse attitude among audit leaders, the very fabric of audit firm culture may be undergoing a profound meta-

morphosis, as the implementation of AI in auditing is expected to affect certain elements of the audit firm culture, such as behaviors, controls, or routines. As per its definition, firm culture emphasizes shared values, beliefs, and norms that guide the attitudes and actions of organizational members. It discusses the impact of culture on organizational outcomes and its role in creating competitive advantage.

When it comes to audit firm culture, the 2012 Deloitte Core Beliefs and Culture - Chairman's Survey highlights that exceptional organizations prioritize the intangible aspects of culture development. When considering factors that influence workplace culture, executives tend to emphasize tangible elements such as financial performance (65%) and competitive compensation (62%). Employees, on the other hand, place greater importance on intangibles such as regular and open communication (50%), employee recognition (49%), and access to management/leadership (47%). However, understanding an organization's current state and desired direction is essential for cultural change. Simply knowing the desired culture isn't sufficient; awareness of the existing culture is equally crucial.

Often regarded as one of the softer aspects of organizational behavior, culture holds significant influence over enterprise change initiatives. Culture has long been recognized as a pivotal component of organi-

Gender	Male	Female				
	69.7%	30.3%				
Seniority	Individual contributor	Middle Management	Senior			
	57.5%	24.2%	18.3%			
A				50th Pctl	75th Pctl	
Age	Mean	Std Dev	25th Pctl			
	35.4	9.5	28.0	35.4	41.0	
Education level (max)	Bachelors	Masters (not MBA)	Masters (MBA)	Doctorate (JD, PhD, etc.)	Unknown (not self-reported)	
	37.9%	31.4%	13.0%	11.2%	6.4%	
Education major	Engineering	Management	Computer Science	Finance	Economics	Accounting
	28.2%	21.9%	15.6%	14.5%	14.3%	9.3%
(most common)	Mathematics	Information systems	Philosophy	Statistics	Marketing	Data Science
	8.6%	7.4%	7.0%	6.4%	4.5%	4.5%
Prior industry experience (most common)	Professional Services (NAICS 54)	Administrative Services (NAICS 56)	Finance (NAICS 52)	Education (NAICS 61)	Information (NAICS 51)	Manufacturing (NAICS 31–33)
	38.4%	13.5%	10.9%	9.1%	8.9%	4.8%
Skills	Data analysis	Python	SQL	Microsoft Excel	Leadership	Machine learning
()	42.1%	37.1%	35.9%	32.0%	31.7%	31.6%
(most common)	Management	R	Project management	Strategy	Research	Analytics
	31.4%	30.0%	29.5%	25.0%	24.0%	23.4%

Figure 3: Descriptive Statistics for AI Personnel in Audit Firms. Source: Fedyk et al., (2022). Is artificial intelligence improving the audit process?

zational effectiveness, capable of either enhancing or hindering outcomes. Indeed, culture serves as a crucial evaluation criterion for reputational and client risk assessments. Both employees and clients are drawn to organizations that resonate with their ideals of success, integrity, and reliability. Transforming an organization's culture typically unfolds gradually unless a significant event prompts attitude shifts and fosters new behaviors (Baxter, 2022). Therefore, when work processes or environments undergo change, this change invariably triggers cultural shifts. The auditing profession is no exception; it, too, experiences its fair share of cultural transformation. The comprehensive literature review has uncovered several key aspects that drive change and impact the cultural landscape within auditing.

Considering culture as the company's character provides insight into team members' beliefs and behaviors, notably, firm culture plays a pivotal role. A 2012 Deloitte study revealed that 94% of leaders and 88% of staff recognize the significance of a distinct work culture in achieving a company's success (Deloitte, 2012). In order to cultivate a workplace culture that aligns with your team's and organization's goals, self-awareness of your role within that culture is paramount. By understanding how audit firm part-

ners' actions, interactions, and contributions fit into the larger cultural context, audit firms can actively shape and enhance the collective experience for everyone involved. Specifically, an audit firm's culture is most conducive to achieving high standards when its management prioritizes professionalism over commercialism, encourages ethical decision-making, and promotes continuous learning, professional commitment, and open communication among audit staff. Firm culture is significantly shaped by the leadership tone set by management and the performance and compensation systems that provide incentives. Existing literature highlights ongoing concerns about the impact of commercialization on audit firm culture (Alberti et al., 2022). At different times and in specific contexts, a firm culture can be either efficient or inefficient. Understanding and assessing your organization's culture can significantly impact its success or failure in today's rapidly changing business environment (Hampden-Turner, 1990). In essence, culture encompasses a set of values, beliefs, and behaviors.

Given the traditional risk-averse mindset prevalent among auditors, which serves as a cultural norm, there is a reluctance to embrace change-especially when it comes to adopting new technologies such as Navigating this cultural shift re-

quires a delicate balance - recogniz-

ing the transformative capabilities

of AI, while also being cognizant of

the potential risks associated with

relying too heavily on AI.

artificial intelligence (AI). As Hofstede et al. (2010) point out, culture is shaped by social context rather than being an innate trait, and it has a profound effect on human behavior.

This leads us to a fascinating question: Are auditors, especially lead audit partners, ready to fully embrace AI? The answer lies at the intersection of organizational culture, individual openness to innovation, and the practical implications of integrating AI into audit practice. While some auditors may readily embrace the potential of AI, others may be cautious due to the cultural inertia associated with their profes-

Navigating this cultural shift requires a delicate balance - recognizing the transformative capabilities of AI, while also being cognizant of the potential risks associated with relying too heavily on AI. As AI continues to evolve, auditors will need to address this issue and actively engage in discussions about readiness, training, and the future of audit practices. Therefore, it is important to carefully analyze the approach of audit partners, especially considering the potential impact of the tone at the top regarding AI, in terms of what partners are conveying to firm em-

ployees about AI and its potential use in the audit. After all, the advancement of auditing depends heavily on the establishment of a supportive culture, which in turn shapes the culture of auditing. This symbiotic relationship between

culture and auditing underscores the importance of culture within the audit profession. Masoud et al. (2023) emphasize that successful audit development depends on establishing a supportive culture within the audit community. They highlight the intricate relationship between culture and auditing, giving rise to what is referred to as audit culture. This concept underscores the deep integration of culture within the audit community, as auditing inherently operates within a cultural framework.

In a study of audit firm culture conducted in Iran, Masoud et al. (2023) find that audit culture serves as the cornerstone of an audit society, embodying a spectrum of values, norms, beliefs, and historical influences that shape the behavior of auditors. It reflects specific values that emanate from the community and influence the cultural milieu of auditors both within the audit environment and the broader society. Thus, fostering audit culture in Iran requires a focused approach to extracting the essential categories and developmental patterns outlined in their research. This approach aims to cultivate a dynamic and vibrant audit culture within the audit environment.

Although a study of audit firm culture in Iran may not be directly applicable to U.S. audit firms, the findings from such research are valuable and demonstrate the need for future research on audit firm culture and audit quality improvement. My article aims to help fill this gap by shedding light on how audit firm culture influences the adoption of AI at audit firms in the United States or Canada.

The tone at the top is considered an informal control mechanism that embodies shared values, beliefs, and traditions, guiding group members' behavior (Falkenberg & Herremans, 1995). It represents a potent form of cultural control (Merchant & Van der Stede, 2017), deriving its influence from its ability to shape employee conduct in ambiguous or unexpected situations—areas where formal control systems, tailored for specific or predictable events, may fall short (Falkenberg & Herremans, 1995). Codes of conduct, formal written statements reflecting an organization's approach to operations, serve to communicate expected behaviors to employees even in the absence of explicit rules. However, these codes only contribute to cultural control when management actively commits to them and communicates

> their significance to subordinates (Grabner et al., 2019).

> According to Grabner et dysfunctional cultures can

> al. (2019), while a strong organizational culture is often seen as advantageous for firms, this isn't always the case. Just as positive cultures can drive success,

lead to significant company issues (e.g., Enron, Volkswagen emissions scandal). A strong organizational culture can create blind spots and inertia due to limited critical questioning and diversity of opinion (Merchant & Van der Stede, 2017). The impact of a strong culture on employee behavior—whether positive or negative—depends on the underlying values upheld by the organization. A well-developed culture can even contribute to detrimental outcomes, exemplified by Arthur Andersen's downfall (e.g., providing questionable financial or internal control advice, engaging in earnings management, fraud, exploiting gaps in accounting standards) (Kelly & Earley, 2009).

As noted by Suddaby et al. (2009), observing behavior enhances understanding of attitudes by providing insights that extend beyond interviewees' performance. This approach also uncovers the underlying structural factors influencing attitudes towards customers, organizations, and other professionals.

Grabner et al. (2019) identify a deficiency in existing literature concerning the influence of audit culture on audit quality, a gap that I aim to address through

this paper. They emphasize the need to understand (1) the specific influence of audit culture on audit quality, and (2) what constitutes an effective audit culture that supports high audit quality and how such a culture can be structured. Despite the ongoing efforts of audit firms to cultivate cultures that enhance audit quality, there remains a scarcity of research in this area to inform best practices within audit firms. While Grabner et al.'s study focuses on Dutch audit firms tasked with enhancing audit quality through organizational cultural changes, their findings are relevant beyond the Netherlands, particularly for audit firms in the U.S. seeking insights on fostering audit quality through cultural frameworks. These findings resonate with my own research topic, which explores how audit firm culture shapes the adoption of AI and its potential to enhance audit quality, among other aspects. In short, organizational culture in general, and the culture of audit firms in particular, is built on shared assumptions, norms, attitudes, and actions. In short, behavioral expectations or norms emerge from the collective beliefs, attitudes, and behaviors within a culture (Grabner et al., 2019).

Nevertheless, as long as humans handle raw data, complete error elimination remains elusive. When AI is embedded in an audit system, it analyzes the data it receives. If inaccurate data is fed to the AI, it will produce erroneous results. Consequently, flawed data can introduce biases during the AI audit process. Systematic errors or inaccuracies in the data may inadvertently propagate these biases, leading to biased or inaccurate outcomes. Furthermore, flawed data can yield spurious correlations and patterns that do not reflect the true underlying relationships. AI models may latch onto these misleading patterns, resulting in predictions or analyses that deviate significantly from reality. This is further reinforced by the Garbage In, Garbage Out (GIGO) principle, which emphasizes that the quality of an AI system's output is directly linked to the quality of its input data. In other words, if flawed or biased information is provided as input to an AI system, the resulting outputs are likely to be inaccurate. To put it simply, poor inputs yield poor outputs. This concept applies not only to programming but also to logical argumentation in general: while soundness implies validity, validity alone does not guarantee soundness. Therefore, it is essential to prioritize high quality input data to achieve reliable and accurate results in any computational process, as inadequate data input leads to unreliable data output, which can ultimately render the results meaningless (Hanson et al., 2023).

Conclusions

This article examines the influence of audit firm culture on the adoption of artificial intelligence in audit firms.

Technological advancements in auditing are not new, as auditors have always sought to enhance their practices to meet demands for better quality and efficiency. Previous research has examined various aspects of technological change, such as the introduction of statistical sampling in the 1960s and the development of business risk methodologies shaped by market forces and changes in the audit environment (Samiolo et al., 2023).

Preliminary data on the use of AI and data analytics tools indicate a generally positive attitude towards their implementation, though questions about their scope and effectiveness remain (Fedyk et al., 2022). AI applications have the potential to significantly improve the effectiveness, efficiency, and quality of audit work (Almufadda & Almezeini, 2022; Dennis, 2024). However, careful internal considerations are necessary before AI can be fully adopted in auditing (Almufadda & Almezeini, 2022).

Challenges to widespread AI adoption include a lack of confidence in the technology (CPA Canada & AICPA, 2020), the high cost of implementing AI tools (Dennis, 2024), and the suitability of AI for all audit clients or situations (Dennis, 2024). Additionally, the impact on the workforce will take time (Griffin, 2019), and there are concerns about the potential for full automation to replace human roles.

Each change in the audit profession has necessitated auditors to acquire new skills and adapt, leading to a shift in culture. This cultural change also involves addressing the limitations of new technologies. Auditors will need to change their mindset to embrace the opportunities and challenges presented by AI (CPA Canada & AICPA, 2020). Future auditors are expected to develop skills in IT and data analytics (Vitali & Giuliani, 2024) and become proficient in data science and machine learning technologies (CPA Canada & AICPA, 2020).

Given the inherent caution of auditors, the integration of AI into the audit process may require a change in organizational culture. During this transformative phase, it is imperative for leadership to define and instill the core principles and beliefs that will guide the changes brought about by the integration of AI (Kelly & Earley, 2009; Schein, 2010). Furthermore, the overarching approach and attitude of leadership has a significant impact on the cultivation of the internal culture of the organization, especially in audit organizations (referenced from Alberti et al., 2022).

Practical Implications for Audit Firms

The integration of AI into auditing brings both opportunities and challenges, necessitating strategic responses from audit firms. Here are some actionable recommendations to help firms leverage AI effectively while addressing potential issues:

Enhance Training and Education

Comprehensive Training Programs: Audit firms should invest in continuous professional development to bridge gaps in training and technical skills. These programs should cover both AI-related technical skills and the broader implications of AI on audit practice, tailored to different staff levels from junior auditors to senior management.

Collaborate with Educational Institutions: Partnering with universities and professional organizations to develop curriculum modules aligned with AI advancements in auditing will ensure that new graduates possess the relevant skills needed for the evolving audit landscape.

Building a Supportive Infrastructure

Invest in Technology and Infrastructure: Firms should allocate resources to develop the necessary infrastructure to integrate AI, including procuring AI tools and ensuring that IT systems are robust enough to support AI technologies.

Data Management Strategies: Effective data management is crucial, particularly to overcome challenges related to accessing and using client data. Firms should focus on improving data integrity and establishing data security and privacy protocols to build client trust.

Strategic Leadership and Cultural Alignment

Leadership Commitment: Leadership must understand and commit to the value of AI, not only in terms of financial investment but also in fostering a culture open to technological innovation. Leaders should actively promote the benefits of AI and align strategic goals with the organization's digital transformation.

Cultural Transformation: The adoption of AI will inevitably impact the organization's culture. Leaders should proactively manage this cultural transformation to ensure that the firm's values, beliefs, and behaviors evolve to support AI integration. This may involve redefining the firm's mission statement, revising performance metrics, and encouraging a balanced approach to innovation.

Overcoming Financial and Technological Barriers

Cost-Benefit Analysis: Conducting thorough cost-benefit analyses can justify AI investments, help firms prioritize engagements, and ensure that the selected technologies meet specific needs.

Pilot Programs: Implementing pilot programs allows firms to test AI tools in controlled environments, evaluate their effectiveness for specific audit tasks, and make necessary adjustments before full deployment.

Improve Client Relationships

Transparency with Clients: Firms should be transparent with clients about the use of AI in audits, in-

cluding explaining the benefits, addressing privacy and security concerns, and ensuring that clients understand how AI is being used.

Tailored AI Solutions: Recognizing that AI may not be suitable for all clients or situations, firms should tailor AI strategies to meet specific client needs. This customization can help overcome skepticism and build client confidence in AI-driven audits.

Potential Limitations of the Study

While the findings offer valuable insights, several limitations should be acknowledged:

- 1. Generalizability: The study focuses primarily on audit firms in the U.S. and Canada, which may limit the generalizability of the findings to other regions or larger firms with different operational dynamics.
- 2. Scope of AI Technologies: The study does not encompass the full range of AI technologies available, and as AI continues to evolve, new tools may emerge that could change the land-scape of AI adoption in auditing.
- 3. Cultural Differences: While the study addresses cultural aspects of audit firms, it may not fully capture the complexity of cultural dynamics across firms or geographies. Cultural resistance to AI may vary based on local norms, firm history, and leadership styles.

Areas for Future Research

To build on these findings, future research could explore the following areas:

- 1. Comparative Studies Across Regions and Firm Sizes: Future research could compare AI adoption strategies and cultural implications across regions and firm sizes, providing a more comprehensive understanding of how different contexts influence AI integration in auditing.
- 2. Longitudinal Studies of Cultural Change: Examining the long-term impact of AI on audit firm culture through longitudinal studies could provide deeper insights into how AI is reshaping professional norms, behaviors, and values over time
- 3. Impact of AI on Audit Quality: Further research is needed to quantify the impact of AI on audit quality through empirical studies that assess the accuracy, efficiency, and overall effectiveness of AI-driven audits compared to traditional methods.
- 4. Ethical Implications of AI in Auditing: As AI becomes more prevalent, research should explore its ethical implications, including biases in AI algorithms, potential overreliance on technology, and the preservation of auditor judgment and skepticism.

By addressing these areas, future research can provide a more nuanced understanding of the intersec-

tion between AI, auditing, and organizational culture, ultimately guiding audit firms as they navigate the challenges and opportunities of AI adoption.

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Review

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