ISSN: 2454-6186 | DOI: 10.47772/IJRISS
Special Issue | Volume VIII Issue XIX December 2024

A Systematic Review on Ethical Challenges of Emerging AI in Accounting Using the ADO Model

Dasyarini Daud*, K. Kishan, Zubir Azhar

School of Management, Universiti Sains Malaysia, Pulau Pinang, Malaysia

***Corresponding Author**

DOI: https://dx.doi.org/10.47772/IJRISS.2024.ICAME2407

Received: 06 December 2024; Accepted: 10 December 2024; Published: 25 December 2024

ABSTRACT

Introduction: Emerging technologies like AI in the accounting sector present ethical challenges, including concerns over transparency, bias, privacy, and accountability. This study is crucial as accountants play a vital role in providing reliable financial information for decision-making, maintaining stakeholder trust, and upholding the integrity of the profession. This study systematically synthesizes the existing literature on Artificial Intelligence, Ethics, and Accounting to identify various related constructs using the Antecedents, Decisions, and Outcomes (ADO) model. It also highlights research gaps and suggests directions for future research.

Methods: The study employs a rigorous systematic literature review (SLR) process, adhering to the PRISMA framework, to select 20 full-text articles relevant to artificial intelligence, ethics, and accounting. The review, conducted for studies published between 2020 and 2024, includes journal, excluding books and conference proceedings, regarding the subject areas of accounting, business, economics and computer science. This review provides an organized overview of the antecedents, decision processes, and outcomes of artificial intelligence, ethics, and accounting.

Results: The study delineates critical challenges in the integration of AI within the accounting sector, including technological advancement, ethical dilemmas, regulatory hurdles, and risk management concerns. To mitigate these issues, it advocates for the establishment of comprehensive ethical frameworks, the deployment of advanced technological systems, and the enhancement of education and awareness among professionals. The findings reveal that these interventions significantly elevate ethical standards, boost operational efficiency, enhance profitability, and ensure the effective and responsible deployment of AI technologies in accounting practices.

Conclusion: The study highlights the need for policymakers to create flexible frameworks and systems to address specific ethical issues of AI in accounting, while also emphasizing the importance of competency and awareness among professionals. It advocates for a centralized governance body to coordinate global standards and foster collaboration, contributing to a comprehensive understanding of ethical AI integration and advancing responsible practices within the sector.

Keywords: ADO model, systematic literature review, artificial intelligence (AI), ethic, accounting

INTRODUCTION

Artificial Intelligence (AI) is commonly defined as the ability of machines to replicate human cognitive functions such as learning, problem-solving, and decision-making, allowing them to process data, recognize patterns, and adapt autonomously (Kaplan & Haenlein, 2019). Technically, AI encompasses technologies like machine learning, natural language processing, and computer vision, which enable machines to perform tasks requiring human intelligence, such as data analysis and automation (Adelakun et al., 2024). Conceptually AI is seen as a transformative tool that enhances human decision-making, particularly in fields like accounting and auditing, where it improves efficiency and accuracy through advanced data analysis and fraud detection (Anica-Popa et al., 2024; ICAEW, 2017).

AI has evolved through distinct phases marked by technological innovations and expanding applications. The mid-20th century saw AI's inception as an academic discipline, led by pioneers like Turing and McCarthy, who developed foundational theories and rule-based systems (McCarthy et al., 2006; Tubing, 1950). According to Omoteso (2012) during 1980s and 1990s introduced neural networks, enabling AI to recognize patterns and make decisions autonomously, with applications extending into fields like accounting. The early 21st century brought big data and deep learning, enhancing AI's capabilities in complex tasks such as natural language processing, but also raising ethical concerns (Kaplan & Haenlein, 2019; Mökander, 2023).

ISSN: 2454-6186 | DOI: 10.47772/IJRISS
Special Issue | Volume VIII Issue XIX December 2024

Strengthening Accounting Through AI Innovations

AI has become a transformative force in accounting, enhancing financial reporting, auditing, tax preparation and decision-making (Schweitze, 2024). It automates routine tasks, reducing errors and increasing operational efficiency (ICAEW, 2017; Pandey et al., 2024). As discussed by Leitner-Hanetseder et al. (2021) in management accounting, AI provides predictive analytics, improving performance monitoring and strategic decision-making. Moreover, AI's role extends to auditing, where it enables comprehensive data analysis and continuous oversight, thus improving audit quality and fraud detection (Adelakun et al., 2024; Minkkinen et al., 2022). Furthermore, as discussed by Castro Pena et al. (2021), later by Cheng et al. (2024). AI also contributes to education by enabling personalized learning experiences and preparing students for AI-integrated accounting roles. Additionally, integrating AI with blockchain enhances data security and audit accuracy, ensuring more reliable financial records (Han et al., 2023; Zhou et al., 2024).

Despite these benefits, AI's integration into accounting poses challenges, such as ethical concerns, privacy issues (ICAEW, 2017; Mökander, 2023), data use including and job displacement (Schweitze, 2024) Furthermore, AI's ability to ensure compliance with tax laws and regulations remains limited, raising significant ethical concerns regarding its application in tax preparation, where strict adherence to legal and regulatory standards is essential (Schweitze, 2024; Cheng et al., 2024). Additionally, implementing AI and blockchain requires substantial investments in technology, training and technical expertise, which may hinder widespread adoption (Han et al., 2023). As argued by Leitner-Hanetseder et al. (2021) the future of AI in accounting will likely involve a shift from routine tasks to more strategic roles, necessitating new skills in technology and data analytics. Addressing these challenges will be critical for the profession to harness AI's full potential (ICAEW, 2017; Schweitze, 2024).

Ethical Considerations in AI-Driven Accounting

The integration of AI in accounting brings significant advancements, such as enhanced data management, process automation, and improved decision-making, but also presents critical ethical challenges. These include algorithmic bias, where AI's reliance on potentially biased data can lead to unfair financial decisions and discriminatory practices (Adelakun et al., 2024; Mehrabi et al., 2021), the "black box" problem, which raises concerns about transparency and accountability in AI-driven decisions (Bathaee, 2018; Shneiderman, 2020), and data privacy and security risks, given AI's handling of sensitive financial information (Schweitze, 2024; Tiron-Tudor et al., 2024). Addressing these ethical dilemmas requires continuous monitoring, collaboration between accountants and AI developers, and the development of frameworks to ensure transparency, fairness, and accountability (Ala-Luopa et al., 2024; Roselli et al., 2019). According to Boulianne et al. (2023) and Schweitze (2024) AI reshapes the accounting profession, it is crucial to uphold ethical standards and maintain trust, necessitating rigorous research and adaptation to these evolving challenges.

The Role of the ADO Model in AI, Ethics, and Accounting

Prior systematic reviews, such as Losbichler and Lehner (2021), examined AI limitations in controlling

processes through complexity and systems theory, while Sherif and Mohsin (2021) explore the combined effects of blockchain, IoT, and AI on mitigating ethical risks in accounting. Similarly, Tiron-Tudor and Deliu (2022) examined algorithmic biases in emerging auditing technologies. Despite these contributions, studies using the ADO (Antecedents, Decisions, and Outcomes) model to systematically examine antecedents, decisions, and outcomes are notably absent (Paul & Benito, 2018).

The ADO model as developed by Paul and Benito (2018), offers a robust structure for analysing complex phenomena by examining three interconnected dimensions: antecedents, which identify explore strategic responses or actions taken; and outcomes, which evaluate the consequences of these decisions. By employing this framework, researchers can systematically review and synthesize literature, identify research gaps and provide a cohesive understanding of ethical challenges in AI and accounting being addressed. Furthermore, the ADO model's ability to clarify causal relationships and reduce fragmentation makes it particularly suited to addressing the intricate interplay between decisions and outcomes in these fields. Compared to other methodologies, such as TCCM (theories-contexts-characteristics-methods), 5W+H (who, when, where, what, why, how), and IMO (input-mediators-outcomes), the ADO framework excels in providing depth and coherence, facilitating a comprehensive understanding within the domain of AI, ethics, and accounting.

The primary aim of this study is to systematically review and synthesize existing research at the intersection of AI, ethics, and accounting, emphasizing how these areas have been examined and conceptualized in the literature. To accomplish this, the research will focus on addressing four key questions:

RQ1: What ethical antecedents related to AI have been explored in the context of accounting?

RQ2: How ethical antecedents influence AI-driven decision-making?

RQ3: What are the key ethical considerations and impacts of AI on accounting practices as identified in the literature?

RQ4: What are the emerging trends in AI ethics within accounting, and how might they influence future accounting practices?

METHODOLOGY

Systematic Literature Reviews (SLRs) serve as an essential tool in academic research by synthesizing existing knowledge within specific domain, identifying gaps, and fostering theory development. By analysing patterns and disparities across studies, SLRs contribute to building robust theoretical frameworks. Additionally, SLRs underpin evidence-based decision-making, offering insights that guide research, policy formulation, and practice. SLRs also prevent redundant research efforts, encouraging a more targeted research agenda and efficient use of resources. The application of models such as the ADO framework strengthens the methodological rigor of SLRs, ensuring transparency, reproducibility, and reduced bias, thereby bolstering the credibility of findings. Leveraging the ADO framework within the SLR methodology facilitates a rigorous and cohesive analysis of the intricate relationships between artificial intelligence, ethics, and accounting. Ultimately, SLRs amplify the impact of research by steering future investigations and fostering the advancement of knowledge in the field (Paul et al., 2023).

Data collection for this research adhered to the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), as depicted in Fig. 1 (Moher et al., 2009). The PRISMA process involves four stages: identification, screening, eligibility, and inclusion. Additionally, as stated by Moher et al. (2009),this methodology guarantees a transparent and systematic review process as the specific procedures involved in these stages are detailed below.

Identification

The process of conducting the systematic review for selecting pertinent articles in this study encompassed three

main stages. The first stage concentrated on identifying appropriate keywords, which was then followed by an extensive search for related terms using various resources such as thesauruses, dictionaries, expert input, and previous research studies. In August 2024, after finalizing the keywords, search strings were crafted specifically for the Scopus and Web of Science databases. During this initial stage, a total of 813 articles were retrieved. The review spans a period of five years, from 2020 to 2024. The keywords employed in the databases to gather the relevant articles included “artificial intelligence (ai)”, “ethic”, “accounting”, “accountant” and “cfo”.

Data Screening and Eligibility

In Stage 2 of the PRISMA protocol, the gathered articles were screened based on the inclusion and exclusion criteria detailed in Table 1. During this stage, titles, abstracts, and keywords were meticulously reviewed to apply the exclusion criteria, which involved filtering out non-article literature and removing duplicates. By the conclusion of Stage 2, 199 articles remained for further evaluation in Stage 3. In this subsequent stage, the selected articles were thoroughly read and reassessed using the same inclusion and exclusion criteria. Only those articles that were highly relevant to the study proceeded to the final inclusion stage. This stringent review process resulted in the exclusion of 179 articles that did not satisfy the eligibility criteria in terms of article type and content relevance.

Table 1 : The Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Document Type	Journal	Book, chapter in book, conference proceeding
Language	English	Non – English
Publication Year	Between 2020-2024	Before 2020
Subject Area	Computer Science, Accounting, Business and Economics	Apart from Computer Science, Accounting, Business, and Economics

Inclusion

In the inclusion stage, the content of each article was meticulously reviewed to ensure its relevance for synthesis. Ultimately, 20 articles were selected for consideration. The study utilized a qualitative content analysis approach to synthesize the research findings, as this method is particularly effective in integrating qualitative and mixed-method data to generate meaningful insights (Bearman & Dawson, 2013). Given the diversity in study designs and outcome measures,

qualitative content analysis was preferred over meta-analysis. The analysis was conducted within the framework of the ADO (Antecedents, Decision, and Outcome) model.

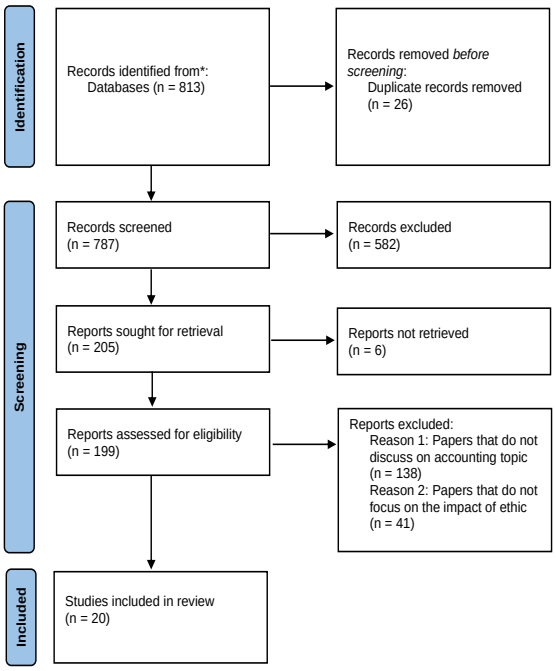

Figure 1: A Flowchart Illustrates the PRISMA Protocol's Selection Process

Reporting

The study employs an ADO framework-based analysis to present the findings. This framework is utilized to extract insights, identify research gaps, and suggest directions for future research. It is important to recognize that the dimensions of the ADO model (Antecedents, Decisions, Outcomes) are closely interconnected. For example, research by Paul and Benito (2018)indicates that factors related to both home and host countries (Antecedents) can influence decisions such as location selection and entry mode (Decisions), which in turn impact performance outcomes (Outcomes). Thus, understanding the interconnections among these dimensions is just as vital as understanding the dimensions themselves for the generation of new knowledge.

ANALYSIS OF FINDINGS

Overview of the Selected Studies

This section reviews 20 research studies, categorized by publication year, study location, ethical antecedents, context, research type, and data. This analysis is crucial for understanding the current literature on artificial intelligence, ethics, and accounting within this context. Most prior studies have primarily focused on ethical issues, with a smaller number addressing technological advancement (14 studies), regulatory (7 studies), and risk concerns (2 studies).

Table 2: Article Included in The Review

Study	Context/Industry	Country	Antecedents			
			TA	ET	RG	RS
Bani Ahmad (2024)	Multinational Corporations (MNCs)	Jordan		/	/	
Fülöp et al. (2023)	Accounting Firm	NA	/	/		
Montagnani et al. (2024)	Diverse Groups	EU	/	/	/	
Pandey et al. (2024)	Hospitality and Tourism	EU, US, & China	/	/	/	
Munoko et al. (2020)	Big Four Accounting Firms	US	/	/	/	
Bocean and Vărzaru (2022)	Financial and Managerial Accounting (FAMA) Sector	Romania		/		/
Cheng et al. (2024)	Educational accounting cases	US	/	/		
Sgantzos et al. (2023)	Users of Large Language Models (LLMs)	India	/	/		/

Zhang et al. (2023)	Various industries	China	/	/	/	
Vărzaru (2022)	Management Accounting	Romania		/		
Minkkinen et al. (2024)	CEO – AI Products	NA	/	/		
Staszkiewicz et al. (2024)	Auditors	Poland		/		
Yoon (2020)	Various industries	Korea		/		
De Villiers (2021)	Accounting body President & members, and academicians	New Zealand	/	/		
Ala-Luopa et al. (2024)	Accountants	NA	/	/		
Zhou et al. (2024)	Public listed Chinese non-financial firms	China	/	/		
Bhattacharya and Mickovic (2024)	Chinese non-financial firms	China	/	/		
Rahman M.J. and Zhu (2024)	Family firms	China	/	/	/	
Abdullah and Almaqtari (2024)	Accounting and auditing fields	Saudi	/	/		
Dell et al. (2024)	Four prominent accounting associations	Global		/	/	

EU = European Unions, US = United States of America
NA = Country is not mentioned specifically
TA = Technology Advancement, ET = Ethics, RG = Regulatory, RS= Risk

a) Year of Publication

Among the 20 selected articles, the majority were published in 2024 (12 articles), followed by 2023 with three articles. In both 2020 and 2022, two articles were published each, while 2021 saw the publication of one article (see Fig. 2). This pattern of publication distribution strongly signals the increasing prominence and urgency of ethical in AI as a vital subject of academic investigation, reflecting its pivotal role in contemporary scholarly discourse.

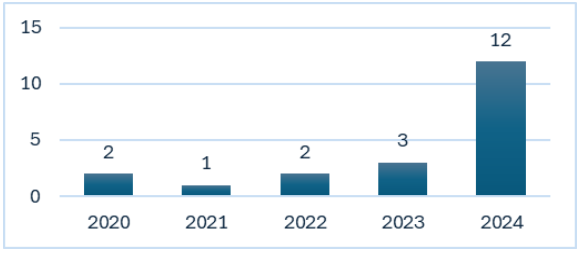

Figure 2: Year of Publication

b) Country of Research Papers

Additionally, in terms of the countries (see Table 3) where the studies were conducted, China had the highest representation with 4 studies. The locations of 3 studies could not be determined, while Romania and the United States of America each contributed 2 articles. The remaining studies were conducted in various other countries, each represented by 1 article.

Table 3: Country of Research Papers

Country	No. of Articles	Country	No. of Articles
China	4	New Zealand	1
European Unions	1	Poland	1
European Unions, US, China	1	Romania	2
Worldwide	1	Saudi	1
India	1	US	2
Jordan	1	Not mentioned	3
Korea	1	**TOTAL**	**20**

c) Type of Study

The studies were categorized into three types: qualitative, quantitative, and mixed methods. Majority of the studies employed qualitative and quantitative approaches, with 9 studies in each category. The remaining studies utilized a mixed-methods approach, totalling 2 studies.

d) **Types of Data Used**

As illustrated in Fig.3 the majority of studies use primary data sources (14 studies), while three studies rely on secondary data sources. Additionally, three studies incorporate both primary and secondary data. The majority of prior studies utilized primary data to obtain firsthand insights and authentic experiences from individuals actively engaged in the field.

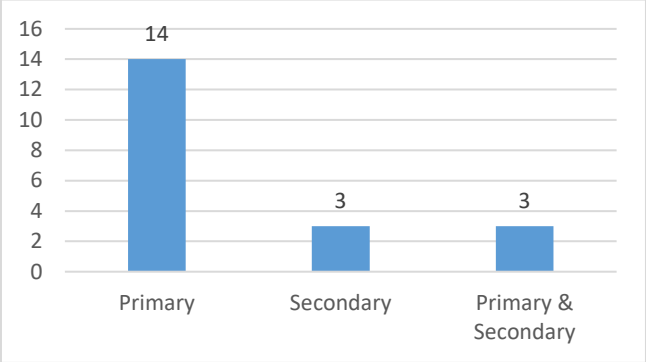

Figure 3: Types of Data Used

3.2 Antecedents, Decisions and Outcomes of Artificial Intelligence, Ethics, and Accounting

This section synthesizes and integrates information obtained from a systematic literature review of artificial intelligence, ethics, and accounting. Using the Antecedents, Decisions, and Outcomes (ADO) model (Fig. 4) and study samples (Table 2), the review evaluates how ethical issues are addressed when AI is implemented in the accounting sector.

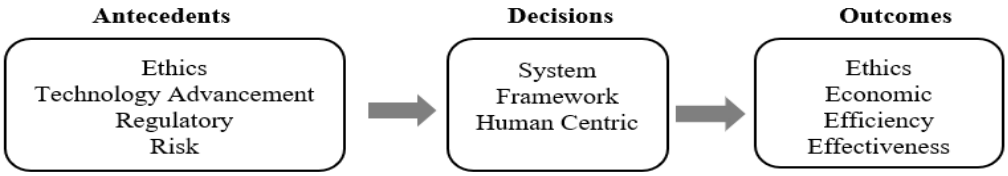

Figure 4: ADO Framework for Artificial Intelligence, Ethics, and Accounting

Antecedents (A)

a) Ethics

Studies in Table 2 reveal that AI integration in accounting has introduced numerous ethical issues, notably data privacy, security, algorithmic bias, transparency, trust, and accountability (Dell et al., 2024). For example, the studies conducted by Varzaru (2022) and Bocean and Varzaru (2022) collectively highlight the transition from traditional accounting governance to intelligent governance, wherein the decision-making process is increasingly supported by AI technologies, significantly influencing user satisfaction in financial and managerial accounting. Notably, both studies converge on the conclusion that trust serves as a central pillar, emerging as the most influential factor driving user satisfaction and performance. Furthermore, a key concern is the fear that robots may replace human judgment, traditionally guided by ethical codes, raising questions about the sufficiency of current legal frameworks (Cheng et al., 2024; Fülöp et al., 2023; Montagnani et al., 2024). AI's limitations in general intelligence and ethical reasoning could threaten principles like safety and nonmaleficence (Munoko et al., 2020). The unpredictable evolution of AI complicates comprehensive regulatory measures. As AI increasingly handles sensitive financial data, the risks of data privacy breaches and algorithmic bias demand stronger ethical and legal frameworks (Bani Ahmad, 2024; Munoko et al., 2020).

There is a significant gap between theoretical frameworks and their practical implementation, particularly as regulatory measures struggle to keep pace with technological advancements. Montagnani et al. (2024) highlight that this lag results in reactive governance, inadequate for the complexities of AI. This is evident in transparency and accountability issues, where AI's opacity hinders stakeholder scrutiny of AI-driven decisions. Bocean and Vărzaru (2022) argue that this opacity not only erodes trust but also complicates responsibility for AI outcomes. Addressing these challenges requires advancing research on the practical implementation of ethical AI. Furthermore, AI's impact on the workforce necessitates strategies to support human workers, ensuring a responsible transition to AI (Dell et al., 2024). While digital technologies can address some ethical concerns, their implementation may introduce new ones, requiring collaboration between accounting

and IT professionals (Bocean & Vărzaru, 2022). By tackling these issues proactively, the accounting profession can leverage AI's benefits while maintaining ethical standards and trust in financial practices.

b) Technology Advancement

The rapid digitization across sectors, including accounting, where AI is increasingly integrated, necessitates a comprehensive examination of its ethical implications. As AI becomes more embedded in accounting practices, it raises significant ethical concerns that demand scrutiny (Abdullah & Almaqtari, 2024; Ala-Luopa et al., 2024; Bhattacharya & Mickovic, 2024; Cheng et al., 2024; De Villiers, 2021; Fülöp et al., 2023; Minkkinen et al., 2024; Montagnani et al., 2024; Munoko et al., 2020; Pandey et al., 2024; Rahman M.J. & Zhu, 2024; Sgantzos et al., 2023; Zhang et al., 2023; Zhou et al., 2024). The swift progression of AI technologies has introduced new risks, particularly due to their inherent characteristics—complexity, opacity, autonomy, unpredictability, and heavy reliance on data—which complicate traditional legal frameworks and make liability assessment more challenging (Montagnani et al., 2024). Understanding how these technologies can be effectively integrated into existing practices is crucial for organizations to maintain competitiveness and efficiency (Abdullah & Almaqtari, 2024).

Leading accounting and audit firms have embraced AI, acknowledging its transformative potential within the industry. However, this integration introduces ethical challenges, including the erosion of human judgment, potential biases in AI algorithms, and heightened concerns regarding data privacy and security (Munoko et al., 2020). These issues underscore the necessity for ongoing discourse and the formulation of comprehensive ethical guidelines to ensure AI's responsible and effective incorporation into accounting practices.

c) Regulatory

The challenge of assigning responsibility for incorrect or unethical AI outcomes—whether to developers, technologists, accountants, or deploying organizations—underscores the need to re-evaluate accountability frameworks and strengthen regulatory oversight in the accounting profession (Munoko et al., 2020). The regulatory discourse on AI in accounting reveals complexities, particularly as existing legal frameworks, such as those in the European Union. Montagnani et al. (2024) highlight the EU's proactive approach to filling gaps in existing legal frameworks, resulting in the adoption of comprehensive legislative measures such as the AI Act, the AI Liability Directive (AILD), and the revised Product Liability Directive (PLD) have proven insufficient to address AI's unique challenges in high-risk sectors like financial services and auditing (Minkkinen et al., 2024). Fülöp et al. (2023) state a significant concern is AI's potential to displace tasks traditionally requiring specialized expertise in these complex regulatory environments. Moreover, enforcing policies that ensure the ethical use of AI is hindered by the technology's complexity, opacity, and unpredictability, complicating compliance and liability assessments (Abdullah & Almaqtari, 2024; Montagnani et al., 2024). To mitigate these legal risks, Bani Ahmad and Pandey et al., (2024) emphasize effective AI integration must align with stringent regulations, such as the General Data Protection Regulation (GDPR) in Europe, and incorporate ethical frameworks to guide its development and deployment, particularly in multinational contexts. The GDPR exemplifies the EU's leadership in AI governance by imposing robust data protection standards, which directly shape the design and operation of AI systems (Pandey et al., 2024). This evolving regulatory ecosystem underscores the importance of a harmonized and enforceable framework that balances the imperative for innovation with the necessity of ethical accountability.

d) Risk

The integration of AI in accounting introduces critical risks, such as data security, privacy concerns, and potential misuse, due to the handling of sensitive information, increasing the risk of breaches and unauthorized access (Bocean & Vărzaru, 2022; Zhang et al., 2023). Accountability is also a significant issue, as the complexity and autonomy of AI systems can obscure decision-making, complicating the assignment of liability when errors or unethical decisions occur (Minkkinen et al., 2024) . Transparency remains a significant concern, as the opacity of AI algorithms can undermine stakeholder trust, emphasizing the need for clear and understandable AI operations (Montagnani et al., 2024). These risks necessitate stringent regulatory frameworks and continuous oversight to address the ethical challenges AI poses in accounting.

Decisions (D)

a) System

As AI technology has rapidly advanced and been integrated into various systems across multiple industries, including accounting. AI systems, designed to replicate human cognitive processes through machine learning, natural language processing, and other sophisticated techniques, can analyse extensive datasets, identify patterns, and make decisions with minimal human oversight (Cheng et al., 2024; Rahman M.J. & Zhu, 2024; Sgantzos et al., 2023). In accounting, AI is transforming traditional practices by automating routine tasks, enhancing decision-making, and improving accuracy. For

instance, Rahman M.J. and Zhu (2024) underscore the innovative use of imbalanced ensemble learning algorithms to predict fraud in family firms, addressing a significant gap in machine learning research within this area. In educational contexts, Cheng et al. (2024) evaluate the capabilities of ChatGPT models 3.5 and 4 in solving accounting cases, demonstrating AI's potential in academic applications. Sgantzos et al. (2023) further contribute by introducing a novel methodology using Triple-Entry Accounting (TEA) to establish a verifiable audit trail for interactions with Large Language Models (LLMs), involving the recording of user input, LLM output, and a third entry on a Distributed Ledger Technology (DLT) platform. This method ensures record integrity, discourages malicious activity, and safeguards intellectual property rights. Similarly, Pandey et al. (2024) acknowledge the role of Generative Artificial Intelligence (GAI) in the hospitality and tourism industry, where it enhances guest experiences, improves operational efficiency and provides financial insights, thereby creating value for both firms and consumers.

a) Framework

The development of a comprehensive ethical framework is essential for addressing the ethical challenges posed by AI in accounting. This framework provides clear guidelines for responsible AI use, ensuring transparency, accountability, and fairness. It tackles key concerns such as data privacy, algorithmic bias, and the potential displacement of human judgment, thereby preventing ethical pitfalls and enabling effective management of ethical dilemmas (Bocean & Vărzaru, 2022) The framework emphasizes the importance of transparency and explainability in AI decision-making, which are vital for maintaining trust in accounting practices. Dell et al. (2024) emphasize the development of the Accounting Framework for AI Ethics (AFAIE), which aligns AI integration with the ethical standards outlined in the AICPA Code of Professional Conduct, ensuring AI systems are used responsibly and ethically. Bani Ahmad (2024) further outlines a comprehensive framework that highlights key ethical considerations related to AI, including the safeguarding of data privacy and security, addressing algorithmic bias, promoting transparency and explainability in AI decision-making, ensuring responsibility and accountability, and evaluating the impact of AI on the workforce.

Moreover, Montagnani et al. (2024) argue for the establishment of frameworks that not only promote innovation but also ensure that AI systems are implemented in a manner that is transparent, ethically sound, and consistent with legal standards. They further emphasize the necessity of preventive legislation and a comprehensive liability framework to cultivate public trust, enhance legal clarity, and secure equitable compensation for any harm caused by AI—measures that are essential for mitigating risks, enhancing organizational coordination, and fostering trust within the rapidly evolving AI industry. These frameworks are intended to create a balance between fostering innovation and ensuring that AI systems are deployed in a way that is transparent, ethical, and aligned with legal requirements (Montagnani et al., 2024). The ethical framework is also integral to AI governance, as Minkkinen et al. (2024) emphasize the need to translate ethical principles into practice by enhancing organizational processes, closing legal gaps, incorporating ESG criteria, and preventing ethical greenwashing. Additionally, Staszkiewicz et al. (2024) stresses the importance of robust risk management strategies within the framework to prevent AI misuse. De Villiers (2021) introduces the Seven Cs model, embedding ethical considerations into the guiding principles for accounting education, emphasizing the development of competencies and redefined skills rather than just knowledge acquisition.

b) Human Centric

Continuous learning, education, training, and awareness are crucial for the effective integration of AI in the accounting industry (Bani Ahmad, 2024; Dell et al., 2024; Dogru et al., 2023; Munoko et al., 2020; Staszkiewicz et al., 2024; Zhang et al., 2023). The competency ensures that professionals demonstrate the requisite abilities to proficiently use AI technology, therefore minimising the likelihood of mistakes and misuse. Furthermore, education fosters ethical awareness, helping accountants to effectively address issues such as data privacy, algorithmic bias, and the substituting of human judgment. In order to remain adaptive and relevant in the industry, accounting profession must engage in continuous training as AI keeps evolving. Additionally, understanding AI's capabilities and limitations enhances decision-making, allowing professionals to critically evaluate AI outputs while applying human judgment where needed (Bocean & Vărzaru, 2022). Finally, Ala-Luopa et al. (2024)raising awareness among stakeholders builds trust in AI-driven accounting practices, ensuring

transparency, compliance, and effective risk management (Ala-Luopa et al., 2024).

Outcomes (O)

a) Ethics

Ethical outcomes related to AI in the accounting sector are broad and complex, reflecting the multifaceted nature of AI's ethical implications within this field (Bani Ahmad, 2024; Dogru et al., 2023; Montagnani et al., 2024; Munoko et al., 2020; Vărzaru, 2022; Yoon, 2020). Empirical studies consistently highlight the imperative of integrating ethical AI into accounting practices, with particular emphasis on the need for robust and comprehensive ethical frameworks within multinational corporations. The study by Bani Ahmad (2024) emphasizes these frameworks are pivotal in elevating industry standards, safeguarding individual rights, and fostering trust among stakeholders. These studies reveal that ethical frameworks are not merely adjuncts to innovation but essential instruments for harmonizing technological advancements with ethical deployment. This harmonization is particularly evident through the prioritization of transparency, accountability, and strict adherence to legal standards (Montagnani et al., 2024). Further, the research indicates that high-tech firms significantly benefit from adopting a proactive approach, which includes stringent regulation adherence and continuous monitoring practices. These practices ensure sustained transparency and ethical integrity in AI operations (Pandey et al., 2024). Additionally, the integration of ethical principles from frameworks such as Ethics of Emerging Information and Communication Technologies (ETICA) and Anticipatory Technology Ethics (ATE) is crucial for accounting firms and regulatory bodies. These frameworks guide responsible AI adoption by pre-emptively addressing ethical concerns and anticipating potential future impacts, thereby steering the industry toward a more ethically sound application of AI (Munoko et al., 2020).

b) Economic

AI is pivotal in boosting business profitability by enhancing efficiency, personalizing customer experiences, and enabling data-driven decisions that optimize revenue and cut costs. Pandey et al. (2024) demonstrate how Generative AI (GAI) increases revenue and reduces expenses by delivering personalized customer experiences and marketing strategies, boosting engagement and loyalty. GAI's ability to create tailored content at scale, such as social media posts and travel itineraries, drives customer interaction and repeat business. Additionally, GAI chatbots improve customer satisfaction by providing instant, personalized responses, reducing the need for human involvement, and cutting labour costs. By streamlining content generation and data analysis, GAI reduces reliance on external resources, positioning companies to maximize revenue and profitability.

These findings align with Limantara's (2024) case study, which examines the economic impact of GAI in enhancing brand experiences for the Unicorns Young Collectors Club (UYCC) in Indonesia and Coca-Cola. In the UYCC case, GAI-enabled immersive art exhibitions created highly interactive and personalized visitor experiences, resulting in increased audience size, higher ticket sales, and greater workshop participation. These advancements not only improved visitor satisfaction and repeat attendance but also contributed to the local economy by attracting more tourists and art enthusiasts. Coca-Cola, on the other hand, leveraged GAI to develop personalized advertising campaigns that strengthened consumer loyalty, enhanced competitiveness, and increased profitability. Quantitatively, both cases demonstrated measurable outcomes, with brands reporting a 30% reduction in marketing costs due to automated processes and a 25% increase in productivity enabled by optimized workflows. These findings underscore the versatility of GAI across diverse sectors and regions, affirming its role as a transformative tool for fostering economic growth, achieving operational efficiency, and enhancing long-term profitability.

c) Efficiency

Another significant impact of AI adoption in the accounting sector is the substantial increase in operational efficiency. Sgantzos et al. (2023) explore how emerging technologies, such as Triple-Entry Accounting (TEA) and Distributed Ledger Technology (DLT), have the potential to transform financial systems and address challenges posed by AI, including issues like bias. Other studies also confirm that models developed using these advanced technologies surpass traditional models in performance (Bhattacharya & Mickovic, 2024; Rahman M.J. & Zhu, 2024). For instance, Bhattacharya and Mickovic (2024) found that the BERT model used for analysing Management Discussion and Analysis (MDA) outperformed both textual and quantitative benchmark models by 15% and 12%, respectively. Moreover, the BERT model detected significantly more instances of fraud—five times more than the textual benchmark and three times more than the quantitative benchmark. Similarly, research by Rahman M.J. and Zhu (2024) demonstrate that imbalanced ensemble learning classifiers offer superior performance compared to conventional models.

d) Effectiveness

Another major effect of adopting AI in the accounting sector is the notable enhancement in operational effectiveness. The studies reveal that ChatGPT's effectiveness in providing accurate solutions is an outcome that varies depending on the specific accounting case and topic, showing stronger performance in tasks requiring explanations, rule applications, and ethical assessments (Cheng et al., 2024). The research by Rahman M.J. and Zhu (2024) highlight that ensemble learning

models exhibit superior outcomes in detecting accounting fraud compared to logistic regression. Moreover Sgantzos et al. (2023) found that integrating TEA and DLT positively impacts financial integrity and provides a mechanism for managing AI's influence on the financial system. Additionally, Bocean and Vărzaru (2022) conclude that ethical considerations, particularly in relation to security and trust, play a pivotal role in enhancing the effectiveness of AI in accounting practices, thereby leads to higher levels of user satisfaction.

3.3 Discussion and Future Research Agenda

The rapid evolution of AI technologies in the accounting sector presents profound ethical challenges, significantly impacting professionals such as accountants, auditors, fraud examiners, and academics. As AI continues to advance, these challenges become increasingly complex, necessitating adaptive solutions that not only address emerging issues but also remain relevant amidst the relentless pace of technological change (De Villiers, 2021; Montagnani et al., 2024). According to Montagnani et al. (2024) while AI offers potential for mitigating certain ethical dilemmas, it simultaneously introduces new and more intricate challenges, particularly concerning transparency in decision-making and the balance of responsibility between human agents and AI systems.

Key risks associated with digital transformation in financial and accounting systems include challenges related to trust, reliability, confidentiality, privacy, and the accessibility of critical information, which are essential to the integrity of accounting practices. Additional studies also highlight concerns regarding intellectual property rights, potential copyright infringement, and the authenticity of information provided to clients, all of which are crucial for sustaining trust and professionalism (Bhattacharya & Mickovic, 2024; Munoko et al., 2020). The opaque and intricate nature of AI algorithms often results in limited transparency, complicating auditors' ability to fully understand and evaluate AI-driven decision-making processes, which is crucial for maintaining accountability. Similarly, the integration of augmented and autonomous AI amplifies concerns over user autonomy and accountability, necessitating a deliberate and systematic approach to ensure these technologies align with established ethical standards.

This underscores the escalating difficulties that governance bodies face in managing the ethical implications of deploying AI technologies within the accounting sector, where ethical compliance is critically important. Ethical and quality requirements are inherently linked, and their concurrent consideration is essential for developing robust digital solutions within the accounting profession. AI should be recognized as a tool that supplements, rather than replaces, human judgment, therefore preventing the abandonment of ethical duty to automated systems and guaranteeing that human judgement and supervision stays important in decision-making procedures (Ala-Luopa et al., 2024; Cheng et al., 2024).

A range of solutions and interventions have been proposed in the literature to address the ethical challenges posed by AI technologies in accounting, reflecting the sector's ongoing struggle to balance innovation with ethical accountability. These proposed solutions include the development of robust systems, the strengthening of ethical frameworks, and the implementation of targeted training programs designed to enhance both competency and ethical awareness among accounting professionals, who are increasingly navigating complex AI-driven environments (Uzougbo et al., 2024; Patil et al., 2024). The impacts of these interventions are multifaceted, addressing not only ethical considerations but also the economic implications, as well as the overall effectiveness and efficiency of accounting practices, as evidenced by existing research (Han et al., 2023).

Supporting research and innovation in AI ethics is fundamental to developing novel solutions and tools, thereby enhancing the accounting sector's ability to adapt responsibly to evolving technologies while maintaining stringent ethical standards. Additionally, accounting professionals who effectively integrate their domain expertise with emerging digital technologies like AI can secure a competitive advantage for their organizations (Bocean & Vărzaru, 2022; Munoko et al., 2020; Pandey et al., 2024).

Addressing ethical issues in digital technology development necessitates a comprehensive and systematic strategy. One of the critical considerations is the need to balance ethical concerns with the practical application of technology, ensuring that ethical principles are not compromised in the pursuit of technological innovation. Conducting thorough assessments of ethical issues both before and after the implementation of technology is crucial for identifying potential ethical dilemmas and devising effective solutions that can be practically applied within the accounting profession. However, these efforts must be complemented by comprehensive regulatory measures to ensure consistent ethical accountability. The situation is further exacerbated in less regulated regions, where the deployment of ethical and responsible AI systems is hindered (Uzougbo et al,.2024;Patil et al., 2024; Staszkiewicz et al., 2024).

Leading regulatory nations such as the European Union, the United Kingdom, and China have demonstrated the critical role of governance in addressing these challenges through robust regulatory measures. Effective regulatory frameworks, such as the EU's AI Act, AI Liability Directive (AILD), alongside the GDPR, illustrate how harmonized governance can

address such challenges by providing clear standards for transparency, accountability, and ethical responsibility in AI systems despite of insufficient to address the specific challenges posed by AI in high-risk sectors such as financial services and auditing (Minkkinen et al., 2024). Similarly, the UK has advanced an AI principles-based regulatory framework emphasizing safety, transparency, and accountability, with plans to formalize these principles through legislation by 2025 (Bandhakavi, 2024; Gallo & Nair, 2024). Meanwhile according to Christopher et al. (2023) China has also introduced significant measures, including the Interim Measures for the Management of Generative Artificial Intelligence Services in 2023. Additionally, China has drafted legislation focusing on data governance, algorithmic accountability, and risk mitigation through mechanisms like AI insurance (Zhang et al., 2024). These measures reflect a commitment by leading nations to foster innovation while demonstrated the critical role of governance in addressing these challenges to ensure ethical oversight and national security. As Sallem et al. (2024) emphasize, countries such as the United States, China, the United Kingdom, and Saudi Arabia are at the forefront of AI adoption and regulation, illustrating how robust governance frameworks enable technological advancement.

However, the disparity between these well-regulated regions and less regulated areas risks deepening global inequities, highlighting the critical need for globally harmonized strategies. Furthermore, previous research reveals that ethical issues are frequently addressed in isolation by different governance bodies in the accounting sector, such as the American Institute of Certified Public Accountants (AICPA), the Association of Chartered Certified Accountants (ACCA), the Institute of Management Accountants (IMA), Chartered Accountants Worldwide (CAW), and the Chartered Global Management Accountant (CGMA), among others (Dell et al., 2024).

Addressing the ethical challenges of AI in accounting requires a multifaceted approach that integrates localized adaptations with global harmonization. The disparity between well-regulated regions and less regulated areas exacerbates global inequities, necessitating harmonized governance efforts. Study by Nurudeen et al. (2024) underscore for developing comprehensive legal structures in regions such as Latin America and Africa, emphasizing cross-regional collaboration, shared ethical guidelines, and the establishment of joint regulatory bodies. Such frameworks, tailored to socio-economic contexts, can mitigate risks and foster the equitable and ethical integration of AI. Moreover, to complement these efforts, the establishment of a centralized organization within the accounting sector to oversee AI-related ethical issues offers a practical solution (Dell et al., 2024). Such an entity would serve as a unifying governance mechanism across jurisdictions, ensuring the consistent application of ethical standards and facilitating the integration of theoretical safeguards into professional practices.

By fostering collaboration and implementing inclusive regulatory frameworks, nations can mitigate the risks associated with AI, addressing global disparities while ensuring accountability, equity, innovation, and adherence to ethical principles. This collaborative effort requires active engagement among stakeholders, including governments, industries, academia, civil society, and international organizations, to develop comprehensive solutions that align AI technologies with human values and societal needs (Patil et al., 2024). Complementing these initiatives is the necessity of a centralized governance body to establish ethical standards, enhance transparency, and foster global cooperation, creating a unified approach to navigating the complex ethical challenges posed by AI.

a) Future Research Agenda

The ADO model developed for this study provides a framework for examining ethical issues related to the rapidly emerging AI technologies in the accounting sector. In this context, "Antecedents" refer to the ethical issues or factors in AI that necessitate research. "Decisions" focus on the actions taken to address these issues, which are categorized into three main areas: system/application development, ethical framework creation, and human resources. The outcomes resulting from these actions are classified into four areas: ethics, economics, efficiency, and effectiveness. Most previous studies have concentrated on proposing frameworks and establishing systems or applications.

Despite the growing body of literature on AI in accounting, there remains a significant gap, as only a limited number of studies have thoroughly examined the readiness of competencies, education, training, and awareness regarding ethical issues related to AI across both the public and private sectors of the accounting profession. This oversight is crucial, as equipping the accounting profession, particularly accountants, with the necessary knowledge and skills to address AI's complexity and ethical challenges is vital for upholding trust and integrity within the field (Munoko et al., 2020). Without a robust focus on preparing accountants in various sectors through education and competency development, the profession risks falling behind in its ability to responsibly adapt to technological advancements, thereby potentially undermining ethical standards and eroding stakeholder trust. Moreover, establishing a competency framework that integrates these ethical dimensions is essential to ensure that accountants are well-prepared to navigate the complexities of AI, underscoring the importance of this area as a critical focus for future research.

b) Limitations of the Study

The primary limitation of this study is the scarcity of empirical research on the ethical challenges of AI in accounting, which constrains our analysis and highlights the need for more in-depth exploration. The study of ethics in AI adoption within the accounting sector is important because accountants are entrusted with providing accurate and reliable financial information, which is crucial for decision-making and maintaining stakeholder trust.

c) Implications

This research presents several important implications particularly concerning the ethical challenges of adopting AI technologies. Policymakers must adopt a flexible approach when addressing ethical issues related to AI in the accounting sector, tailoring their decisions to the specific nature of the challenges encountered. Certain ethical concerns may require the establishment of robust frameworks to provide clear guidelines and standards for AI usage, ensuring accountability and fairness. For other issues, particularly those involving technical complexities or data security, the introduction of new systems or applications may be more appropriate to mitigate risks effectively. Meanwhile, ethical challenges related to human oversight, such as bias and decision-making transparency, may necessitate targeted efforts to enhance competencies and raise awareness through ongoing education and training. By taking a nuanced approach, policymakers can create a comprehensive strategy that addresses the diverse ethical concerns arising from AI adoption in the accounting sector.

For governance bodies, the research offers critical insights into the necessity of global collaboration and the establishment of a centralized governance function. Given the global nature of the accounting profession and the cross-border impact of AI technologies, a unified approach is essential to ensure consistent oversight and regulation. A centralized body could coordinate ethical standards, communicate and promote best practices, and facilitate knowledge-sharing among different jurisdictions. This collaborative effort would not only enhance the ethical governance of AI technologies but also ensure that the accounting sector adapts responsibly to rapid technological advancements, maintaining trust and credibility among stakeholders worldwide.

CONCLUSION

The integration of AI in accounting presents ethical challenges, such as transparency, bias, privacy, and accountability, requiring the profession to adapt responsibly to technological advancements. This study systematically synthesizes literature on AI, ethics, and accounting, identifying gaps and suggesting future research directions using the ADO model. It highlights that the integration of robust regulatory frameworks and harmonized legal structures supported by cross-regional collaboration are critical for addressing these challenges effectively. Complementing this is the need for a centralized governance body to establish ethical standards, enhance transparency, and foster global collaboration. The findings emphasize that while AI offers transformative solutions, it also introduces new ethical dilemmas. A comprehensive strategy encompassing policy and regulatory frameworks, robust systems, and competency-building is essential to navigate these challenges. Governance bodies must remain agile, adapting to evolving ethical concerns through flexible policies, collaboration, and continuous monitoring to ensure these technologies align with established ethical standards. This approach will enable the accounting sector and profession to uphold its integrity, ensure responsible AI integration, and to foster stakeholder trust in a rapidly advancing technological landscape.

REFERENCES

1. Abdullah, A. A. H., & Almaqtari, F. A. (2024). The impact of artificial intelligence and Industry 4.0 on transforming accounting and auditing practices. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(1). https://doi.org/10.1016/j.joitmc.2024.100218
2. Adelakun, B. O., Onwubuariri, E. R., Adeniran, G. A., & Ntiakoh, A. (2024). Enhancing fraud detection in accounting through AI: Techniques and case studies. *Finance & Accounting Research Journal*, *6*(6), 978–999. https://doi.org/10.51594/farj.v6i6.1232
3. Adelakun, Majekodunmi, T. G., & Akintoye, O. S. (2024). AI and ethical accounting: Navigating challenges and opportunities. *International Journal of Advanced Economics*, *6*(6), 224–241. https://doi.org/10.51594/ijae.v6i6.1230
4. Ala-Luopa, S., Olsson, T., Väänänen, K., Hartikainen, M., & Makkonen, J. (2024). Trusting Intelligent Automation in Expert Work: Accounting Practitioners' Experiences and Perceptions. *Computer Supported Cooperative Work: CSCW: An International Journal*. https://doi.org/10.1007/s10606-024-09499-6

5. Anica-Popa, I. F., Vrîncianu, M., Anica-Popa, L. E., Cișmașu, I. D., & Tudor, C. G. (2024). Framework for Integrating Generative AI in Developing Competencies for Accounting and Audit Professionals. *Electronics (Switzerland)*, *13*(13). https://doi.org/10.3390/electronics13132621
6. Bandhakavi, S. (2024, November 7). *DSIT secretary confirms UK to legislate on AI risks in 2025*. Tech Monitor. https://www.techmonitor.ai/digital-economy/ai-and-automation/uk-ai-legislation-2025
7. Bani Ahmad, A. Y. A. (2024). Ethical implications of artificial intelligence in accounting: A framework for responsible ai adoption in multinational corporations in Jordan. *International Journal of Data and Network Science*, *8*(1), 401–414. https://doi.org/10.5267/j.ijdns.2023.9.014
8. Bathaee, Y. (2018). THE ARTIFICIAL INTELLIGENCE BLACK BOX AND THE FAILURE OF INTENT AND CAUSATION. *Harvard Journal of Law & Technology*, *31*(2), 890–938. https://www.theverge.com/
9. Bearman, M., & Dawson, P. (2013). Qualitative Synthesis And Systematic Review In Health Professions Education. *Medical Education*, *47*(3), 252–260.
10. Bhattacharya, I., & Mickovic, A. (2024). Accounting fraud detection using contextual language learning. *International Journal of Accounting Information Systems*, *53*. https://doi.org/10.1016/j.accinf.2024.100682
11. Bocean, C. G., & Vărzaru, A. A. (2022). A Two-Stage SEM–Artificial Neural Network Analysis of Integrating Ethical and Quality Requirements in Accounting Digital Technologies. *Systems*, *10*(4). https://doi.org/10.3390/systems10040121
12. Boulianne, E. , Fortin, M. , & Lecompte, A. (2023). Artificial Intelligence And Data Analytics: Ethical Implications For Accounting. In *Research Handbook On Accounting And Ethics* (pp. 168–179). Edward Elgar Publishing.
13. Castro Pena, M. L., Carballal, A., Rodríguez-Fernández, N., Santos, I., & Romero, J. (2021). Artificial intelligence applied to conceptual design. A review of its use in architecture. In *Automation in Construction* (Vol. 124). Elsevier B.V. https://doi.org/10.1016/j.autcon.2021.103550
14. Cheng, Dunn, Holt, Inger, Jenkins J.G., Jones, Long, Loraas, Mathis, & Stanley. (2024). Artificial Intelligence's Capabilities, Limitations, and Impact on AccountiAbdullah, A. A. H., & Almaqtari, F. A. (2024). The impact of artificial intelligence and Industry 4.0 on transforming accounting and auditing practices. Journal of Open Innovation: Technology, Market, and Complexity, 10(1). https://doi.org/10.1016/j.joitmc.2024.100218
15. Adelakun, B. O., Onwubuariri, E. R., Adeniran, G. A., & Ntiakoh, A. (2024). Enhancing fraud detection in accounting through AI: Techniques and case studies. Finance & Accounting Research Journal, 6(6), 978–999. https://doi.org/10.51594/farj.v6i6.1232
16. Adelakun, Majekodunmi, T. G., & Akintoye, O. S. (2024). AI and ethical accounting: Navigating challenges and opportunities. International Journal of Advanced Economics, 6(6), 224–241. https://doi.org/10.51594/ijae.v6i6.1230
17. Ala-Luopa, S., Olsson, T., Väänänen, K., Hartikainen, M., & Makkonen, J. (2024). Trusting Intelligent Automation in Expert Work: Accounting Practitioners' Experiences and Perceptions. Computer Supported Cooperative Work: CSCW: An International Journal. https://doi.org/10.1007/s10606-024-09499-6
18. Anica-Popa, I. F., Vrîncianu, M., Anica-Popa, L. E., Cișmașu, I. D., & Tudor, C. G. (2024). Framework for Integrating Generative AI in Developing Competencies for Accounting and Audit Professionals. Electronics (Switzerland), 13(13). https://doi.org/10.3390/electronics13132621
19. Bandhakavi, S. (2024, November 7). DSIT secretary confirms UK to legislate on AI risks in 2025. Tech Monitor. https://www.techmonitor.ai/digital-economy/ai-and-automation/uk-ai-legislation-2025
20. Bani Ahmad, A. Y. A. (2024). Ethical implications of artificial intelligence in accounting: A framework for responsible ai adoption in multinational corporations in Jordan. International Journal of Data and Network Science, 8(1), 401–414. https://doi.org/10.5267/j.ijdns.2023.9.014
21. Bathaee, Y. (2018). THE ARTIFICIAL INTELLIGENCE BLACK BOX AND THE FAILURE OF INTENT AND CAUSATION. Harvard Journal of Law & Technology, 31(2), 890–938. https://www.theverge.com/
22. Bearman, M., & Dawson, P. (2013). Qualitative Synthesis And Systematic Review In Health Professions Education. Medical Education, 47(3), 252–260.
23. Bhattacharya, I., & Mickovic, A. (2024). Accounting fraud detection using contextual language learning. International Journal of Accounting Information Systems, 53. https://doi.org/10.1016/j.accinf.2024.100682
24. Bocean, C. G., & Vărzaru, A. A. (2022). A Two-Stage SEM–Artificial Neural Network Analysis of Integrating Ethical and Quality Requirements in Accounting Digital Technologies. Systems, 10(4). https://doi.org/10.3390/systems10040121
25. Boulianne, E. , Fortin, M. , & Lecompte, A. (2023). Artificial Intelligence And Data Analytics: Ethical Implications For Accounting. In Research Handbook On Accounting And Ethics (pp. 168–179). Edward Elgar Publishing.
26. Castro Pena, M. L., Carballal, A., Rodríguez-Fernández, N., Santos, I., & Romero, J. (2021). Artificial intelligence applied to conceptual design. A review of its use in architecture. In Automation in Construction (Vol. 124). Elsevier B.V. https://doi.org/10.1016/j.autcon.2021.103550

27. Cheng, Dunn, Holt, Inger, Jenkins J.G., Jones, Long, Loraas, Mathis, & Stanley. (2024). Artificial Intelligence's Capabilities, Limitations, and Impact on Accounting Education: Investigating ChatGPT's Performance on Educational Accounting Cases. Issues in Accounting Education , 39(2), 23–47.
28. Christopher, F., Julie, H., & Dongwoo, K. (2023, August 29). China's New Rules For Generative AI: An Emerging Regulatory Framework. Fasken. https://www.fasken.com/en/knowledge/2023/08/chinas-new-rules-for-generative-ai?
29. De Villiers, R. (2021). Seven principles to ensure future-ready accounting graduates – a model for future research and practice. Meditari Accountancy Research, 29(6), 1354–1380. https://doi.org/10.1108/MEDAR-04-2020-0867
30. Dell, S., Akpan, M., & Carr, A. (2024). Aligning artificial intelligence with ethical accountancy: A global perspective on emerging frameworks. Corporate Ownership and Control, 21(1), 47–54. https://doi.org/10.22495/cocv21i1art5
31. Dogru, T., Line, N., Mody, M., Hanks, L., Abbott, J., Acikgoz, F., Assaf, A., Bakir, S., Berbekova, A., Bilgihan, A., Dalton, A., Erkmen, E., Geronasso, M., Gomez, D., Graves, S., Iskender, A., Ivanov, S., Kizildag, M., Lee, M., … Zhang, T. (2023). Generative Artificial Intelligence in the Hospitality and Tourism Industry: Developing a Framework for Future Research. Journal of Hospitality and Tourism Research. https://doi.org/10.1177/10963480231188663
32. Fülöp, M. T., Topor, D. I., Ionescu, C. A., Cifuentes-Faura, J., & Măgdaș, N. (2023). ETHICAL CONCERNS ASSOCIATED WITH ARTIFICIAL INTELLIGENCE IN THE ACCOUNTING PROFESSION: A CURSE OR A BLESSING? Journal of Business Economics and Management, 24(2), 387–404. https://doi.org/10.3846/jbem.2023.19251
33. Gallo, V., & Nair, S. (2024, February 21). The UK's framework for AI regulation. Deloitte. https://www.deloitte.com/uk/en/Industries/financial-services/blogs/the-uks-framework-for-ai-regulation.html
34. Han, H., Shiwakoti, R. K., Jarvis, R., Mordi, C., & Botchie, D. (2023). Accounting and auditing with blockchain technology and artificial Intelligence: A literature review. International Journal of Accounting Information Systems, 48. https://doi.org/10.1016/j.accinf.2022.100598
35. ICAEW. (2017, June 27). Artificial intelligence: The future of accountancy. ICAEW. https://www.icaew.com/technical/technology/artificial-intelligence/artificial-intelligence-the-future-of-accountancy
36. Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. In Business Horizons (Vol. 62, Issue 1, pp. 15–25). Elsevier Ltd. https://doi.org/10.1016/j.bushor.2018.08.004
37. Leitner-Hanetseder, S., Lehner, O. M., Eisl, C., & Forstenlechner, C. (2021). A profession in transition: actors, tasks and roles in AI-based accounting. Journal of Applied Accounting Research, 22(3), 539–556. https://doi.org/10.1108/JAAR-10-2020-0201
38. Limantara, Q. R. (2024). Exploring the Role of Generative Artificial Intelligence in Crafting Brand Experiences: Insights from Selected Case Studies. International Journal of Creative Multimedia, 5(2), 88–100. https://doi.org/10.33093/ijcm.2024.5.2.6
39. Losbichler, H., & Lehner, O. M. (2021). Limits of artificial intelligence in controlling and the ways forward: a call for future accounting research. Journal of Applied Accounting Research, 22(2), 365–382. https://doi.org/10.1108/JAAR-10-2020-0207
40. McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006). A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence. AI Magazine, 27(4), 12–14.
41. Mehrabi, N., Morstatter, F., Saxena, N., Lerman, K., & Galstyan, A. (2021). A Survey on Bias and Fairness in Machine Learning. In ACM Computing Surveys (Vol. 54, Issue 6). Association for Computing Machinery. https://doi.org/10.1145/3457607
42. Minkkinen, M., Laine, J., & Mäntymäki, M. (2022). Continuous Auditing of Artificial Intelligence: a Conceptualization and Assessment of Tools and Frameworks. Digital Society, 1(3). https://doi.org/10.1007/s44206-022-00022-2
43. Minkkinen, M., Niukkanen, A., & Mäntymäki, M. (2024). What about investors? ESG analyses as tools for ethics-based AI auditing. AI and Society, 39(1), 329–343. https://doi.org/10.1007/s00146-022-01415-0
44. Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA Statement. In Open Medicine (Vol. 3, Issue 2).
45. Mökander, J. (2023). Auditing of AI: Legal, Ethical and Technical Approaches. Digital Society, 2(3). https://doi.org/10.1007/s44206-023-00074-y
46. Montagnani, M. L., Najjar, M. C., & Davola, A. (2024). The EU Regulatory approach(es) to AI liability, and its Application to the financial services market. Computer Law and Security Review, 53. https://doi.org/10.1016/j.clsr.2024.105984

47. Mubarak Opeyemi Nurudeen, Adetoyese Latilo, Hendrickx Oreoluwa Imosemi, & Queenette Anuoluwapo Imosemi. (2024). Comparative legal frameworks for regulating artificial intelligence: A model for harmonizing AI laws in Latin America and Africa. Global Journal of Research in Multidisciplinary Studies, 2(1), 34–49. https://doi.org/10.58175/gjrms.2024.2.1.0038
48. Munoko, I., Brown-Liburd, H. L., & Vasarhelyi, M. (2020). The Ethical Implications of Using Artificial Intelligence in Auditing. Journal of Business Ethics, 167(2), 209–234. https://doi.org/10.1007/s10551-019-04407-1
49. Ngozi Samuel Uzougbo, Chinonso Gladys Ikegwu, & Adefolake Olachi Adewusi. (2024). Legal accountability and ethical considerations of AI in financial services. GSC Advanced Research and Reviews, 19(2), 130–142. https://doi.org/10.30574/gscarr.2024.19.2.0171
50. Omoteso, K. (2012). The application of artificial intelligence in auditing: Looking back to the future. Expert Systems with Applications, 39(9), 8490–8495. https://doi.org/10.1016/j.eswa.2012.01.098
51. Pandey, A., Dongre, N., & Gupta, O. P. (2021). ARTIFICIAL INTELLIGENCE IN ACCOUNTING: OPPORTUNITIES & CHALLENGES. BI-LINGUAL INTERNATIONAL RESEARCH JOURNAL, 11(41), 226–231. https://www.researchgate.net/publication/378696831
52. Patil, S. M., Todakar, P., & Mogare, H. (2024). Regulatory Frameworks for Ethical AI Development in Coding. International Journal for Research in Applied Science & Engineering Technology (IJRASET), 12(6), 2018–2024. https://doi.org/10.22214/ijraset.2024.63445
53. Paul, J., & Benito, G. R. G. (2018). A review of research on outward foreign direct investment from emerging countries, including China: what do we know, how do we know and where should we be heading? Asia Pacific Business Review, 24(1), 90–115. https://doi.org/10.1080/13602381.2017.1357316
54. Paul, J., Khatri, P., & Kaur Duggal, H. (2023). Frameworks for developing impactful systematic literature reviews and theory building: What, Why and How? Journal of Decision Systems. https://doi.org/10.1080/12460125.2023.2197700
55. Rahman M.J., & Zhu, H. (2024). Detecting Accounting Fraud In Family Firms: Evidence From Machine Learning Approaches. Advances in Accounting, 64. https://doi.org/10.1016/j.adiac.2023.100722
56. Roselli, D., Matthews, J., & Talagala, N. (2019). Managing bias in AI. The Web Conference 2019 - Companion of the World Wide Web Conference, WWW 2019, 539–544. https://doi.org/10.1145/3308560.3317590
57. Sallem, N. R. M., Hussain, N. H. C., Muhmad, S. N., Adnan, N. S., & Halmi, S. A. H. (2024). Artificial Intelligence (AI) Revolution in Accounting and Auditing Field: A Bibliometric Analysis. Advances in Social Sciences Research Journal, 11(9.2), 64–78. https://doi.org/10.14738/assrj.119.2.17402
58. Schweitze, B. (2024). Artificial Intelligence (AI) Ethics in Accounting. Journal of Accounting, Ethics & Public Policy, 25(1). https://doi.org/10.60154/jaepp.2024.v25n1p67
59. Sgantzos, K., Hemairy, M. Al, Tzavaras, P., & Stelios, S. (2023). Triple-Entry Accounting as a Means of Auditing Large Language Models. Journal of Risk and Financial Management, 16(9). https://doi.org/10.3390/jrfm16090383
60. Sherif, K., & Mohsin, H. (2021). The effect of emergent technologies on accountant`s ethical blindness. International Journal of Digital Accounting Research, 21, 61–94. https://doi.org/10.4192/1577-8517-v21_3
61. Shneiderman. (2020). Bridging The Gap Between Ethics And Practice: Guidelines For Reliable, Safe, And Trustworthy Human-Centered AI Systems. ACM Transactions on Interactive Intelligent Systems (TiiS), 10(4), 1–31.
62. Staszkiewicz, P., Horobiowski, J., Szelągowska, A., & Strzelecka, A. M. (2024). Artificial intelligence legal personality and accountability: auditors' accounts of capabilities and challenges for instrument boundary. Meditari Accountancy Research, 32(7), 141–167. https://doi.org/10.1108/MEDAR-10-2023-2204
63. Tiron-Tudor, A., & Deliu, D. (2022). Reflections on the human-algorithm complex duality perspectives in the auditing process. Qualitative Research in Accounting and Management, 19(3), 255–285. https://doi.org/10.1108/QRAM-04-2021-0059
64. Tiron-Tudor, A., Rodgers, W., & Deliu, D. (2024). The accounting profession in the Twilight Zone: navigating digitalisation's sided challenges through ethical pathways for decision-making. Accounting, Auditing and Accountability Journal. https://doi.org/10.1108/AAAJ-12-2022-6173
65. Tubing, A. M. (1950). MIND A QUARTERLY REVIEW OF PSYCHOLOGY AND PHILOSOPHY I.-COMPUTING MACHINERY AND INTELLIGENCE. Computing Machinery And Intelligence, 9(236), 433–460. http://mind.oxfordjournals.org/
66. Vărzaru, A. A. (2022). Assessing the Impact of AI Solutions' Ethical Issues on Performance in Managerial Accounting. Electronics (Switzerland), 11(14). https://doi.org/10.3390/electronics11142221
67. Yoon, S. (2020). The Impact of New Technology on Ethics in Accounting: Opportunities, Threats, and Ethical Concerns. Korean Management Review, 49(4), 983–1010. https://doi.org/10.17287/kmr.2020.49.4.983

68. Zhang, L., Yang, J., Cheng, Y., Zhao, J., Han, X., Zheng, Z., & Xu, X. (2024, May 2). Artificial Intelligence Law of the People's Republic of China (Draft for Suggestions from Scholars). Center for Security and Emerging Technology. https://cset.georgetown.edu/publication/china-ai-law-draft/
69. Zhang, Zhu, W., Dai, J., Wu, Y., & Chen, X. (2023). Ethical impact of artificial intelligence in managerial accounting. International Journal of Accounting Information Systems, 49. https://doi.org/10.1016/j.accinf.2023.100619
70. Zhou, Y., Xiao, Z., Gao, R., & Wang, C. (2024). Using data-driven methods to detect financial statement fraud in the real scenario. International Journal of Accounting Information Systems, 54. https://doi.org/10.1016/j.accinf.2024.100693
71. ng Education: Investigating ChatGPT's Performance on Educational Accounting Cases. *Issues in Accounting Education* , *39*(2), 23–47.
72. Christopher, F., Julie, H., & Dongwoo, K. (2023, August 29). *China's New Rules For Generative AI: An Emerging Regulatory Framework*. Fasken. https://www.fasken.com/en/knowledge/2023/08/chinas-new-rules-for-generative-ai?
73. De Villiers, R. (2021). Seven principles to ensure future-ready accounting graduates – a model for future research and practice. *Meditari Accountancy Research*, *29*(6), 1354–1380. https://doi.org/10.1108/MEDAR-04-2020-0867
74. Dell, S., Akpan, M., & Carr, A. (2024). Aligning artificial intelligence with ethical accountancy: A global perspective on emerging frameworks. *Corporate Ownership and Control*, *21*(1), 47–54. https://doi.org/10.22495/cocv21i1art5
75. Dogru, T., Line, N., Mody, M., Hanks, L., Abbott, J., Acikgoz, F., Assaf, A., Bakir, S., Berbekova, A., Bilgihan, A., Dalton, A., Erkmen, E., Geronasso, M., Gomez, D., Graves, S., Iskender, A., Ivanov, S., Kizildag, M., Lee, M., … Zhang, T. (2023). Generative Artificial Intelligence in the Hospitality and Tourism Industry: Developing a Framework for Future Research. *Journal of Hospitality and Tourism Research*. https://doi.org/10.1177/10963480231188663
76. Fülöp, M. T., Topor, D. I., Ionescu, C. A., Cifuentes-Faura, J., & Măgdaș, N. (2023). ETHICAL CONCERNS ASSOCIATED WITH ARTIFICIAL INTELLIGENCE IN THE ACCOUNTING PROFESSION: A CURSE OR A BLESSING? *Journal of Business Economics and Management*, *24*(2), 387–404. https://doi.org/10.3846/jbem.2023.19251
77. Gallo, V., & Nair, S. (2024, February 21). *The UK's framework for AI regulation*. Deloitte. https://www.deloitte.com/uk/en/Industries/financial-services/blogs/the-uks-framework-for-ai-regulation.html
78. Han, H., Shiwakoti, R. K., Jarvis, R., Mordi, C., & Botchie, D. (2023). Accounting and auditing with blockchain technology and artificial Intelligence: A literature review. *International Journal of Accounting Information Systems*, *48*. https://doi.org/10.1016/j.accinf.2022.100598
79. ICAEW. (2017, June 27). *Artificial intelligence: The future of accountancy*. ICAEW. https://www.icaew.com/technical/technology/artificial-intelligence/artificial-intelligence-the-future-of-accountancy
80. Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. In *Business Horizons* (Vol. 62, Issue 1, pp. 15–25). Elsevier Ltd. https://doi.org/10.1016/j.bushor.2018.08.004
81. Leitner-Hanetseder, S., Lehner, O. M., Eisl, C., & Forstenlechner, C. (2021). A profession in transition: actors, tasks and roles in AI-based accounting. *Journal of Applied Accounting Research*, *22*(3), 539–556. https://doi.org/10.1108/JAAR-10-2020-0201
82. Limantara, Q. R. (2024). Exploring the Role of Generative Artificial Intelligence in Crafting Brand Experiences: Insights from Selected Case Studies. *International Journal of Creative Multimedia*, *5*(2), 88–100. https://doi.org/10.33093/ijcm.2024.5.2.6
83. Losbichler, H., & Lehner, O. M. (2021). Limits of artificial intelligence in controlling and the ways forward: a call for future accounting research. *Journal of Applied Accounting Research*, *22*(2), 365–382. https://doi.org/10.1108/JAAR-10-2020-0207
84. McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006). A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence. *AI Magazine*, *27*(4), 12–14.
85. Mehrabi, N., Morstatter, F., Saxena, N., Lerman, K., & Galstyan, A. (2021). A Survey on Bias and Fairness in Machine Learning. In *ACM Computing Surveys* (Vol. 54, Issue 6). Association for Computing Machinery. https://doi.org/10.1145/3457607
86. Minkkinen, M., Laine, J., & Mäntymäki, M. (2022). Continuous Auditing of Artificial Intelligence: a Conceptualization and Assessment of Tools and Frameworks. *Digital Society*, *1*(3). https://doi.org/10.1007/s44206-022-00022-2

87. Minkkinen, M., Niukkanen, A., & Mäntymäki, M. (2024). What about investors? ESG analyses as tools for ethics-based AI auditing. *AI and Society*, *39*(1), 329–343. https://doi.org/10.1007/s00146-022-01415-0
88. Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA Statement. In *Open Medicine* (Vol. 3, Issue 2).
89. Mökander, J. (2023). Auditing of AI: Legal, Ethical and Technical Approaches. *Digital Society*, *2*(3). https://doi.org/10.1007/s44206-023-00074-y
90. Montagnani, M. L., Najjar, M. C., & Davola, A. (2024). The EU Regulatory approach(es) to AI liability, and its Application to the financial services market. *Computer Law and Security Review*, *53*. https://doi.org/10.1016/j.clsr.2024.105984
91. Mubarak Opeyemi Nurudeen, Adetoyese Latilo, Hendrickx Oreoluwa Imosemi, & Queenette Anuoluwapo Imosemi. (2024). Comparative legal frameworks for regulating artificial intelligence: A model for harmonizing AI laws in Latin America and Africa. *Global Journal of Research in Multidisciplinary Studies*, *2*(1), 34–49. https://doi.org/10.58175/gjrms.2024.2.1.0038
92. Munoko, I., Brown-Liburd, H. L., & Vasarhelyi, M. (2020). The Ethical Implications of Using Artificial Intelligence in Auditing. *Journal of Business Ethics*, *167*(2), 209–234. https://doi.org/10.1007/s10551-019-04407-1
93. Ngozi Samuel Uzougbo, Chinonso Gladys Ikegwu, & Adefolake Olachi Adewusi. (2024). Legal accountability and ethical considerations of AI in financial services. *GSC Advanced Research and Reviews*, *19*(2), 130–142. https://doi.org/10.30574/gscarr.2024.19.2.0171
94. Omoteso, K. (2012). The application of artificial intelligence in auditing: Looking back to the future. *Expert Systems with Applications*, *39*(9), 8490–8495. https://doi.org/10.1016/j.eswa.2012.01.098
95. Pandey, A., Dongre, N., & Gupta, O. P. (2021). ARTIFICIAL INTELLIGENCE IN ACCOUNTING: OPPORTUNITIES & CHALLENGES. *BI-LINGUAL INTERNATIONAL RESEARCH JOURNAL*, *11*(41), 226–231. https://www.researchgate.net/publication/378696831
96. Patil, S. M., Todakar, P., & Mogare, H. (2024). Regulatory Frameworks for Ethical AI Development in Coding. *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, *12*(6), 2018–2024. https://doi.org/10.22214/ijraset.2024.63445
97. Paul, J., & Benito, G. R. G. (2018). A review of research on outward foreign direct investment from emerging countries, including China: what do we know, how do we know and where should we be heading? *Asia Pacific Business Review*, *24*(1), 90–115. https://doi.org/10.1080/13602381.2017.1357316
98. Paul, J., Khatri, P., & Kaur Duggal, H. (2023). Frameworks for developing impactful systematic literature reviews and theory building: What, Why and How? *Journal of Decision Systems*. https://doi.org/10.1080/12460125.2023.2197700
99. Rahman M.J., & Zhu, H. (2024). Detecting Accounting Fraud In Family Firms: Evidence From Machine Learning Approaches. *Advances in Accounting*, *64*. https://doi.org/10.1016/j.adiac.2023.100722
100. Roselli, D., Matthews, J., & Talagala, N. (2019). Managing bias in AI. *The Web Conference 2019 - Companion of the World Wide Web Conference, WWW 2019*, 539–544. https://doi.org/10.1145/3308560.3317590
101. Sallem, N. R. M., Hussain, N. H. C., Muhmad, S. N., Adnan, N. S., & Halmi, S. A. H. (2024). Artificial Intelligence (AI) Revolution in Accounting and Auditing Field: A Bibliometric Analysis. *Advances in Social Sciences Research Journal*, *11*(9.2), 64–78. https://doi.org/10.14738/assrj.119.2.17402
102. Schweitze, B. (2024). Artificial Intelligence (AI) Ethics in Accounting. *Journal of Accounting, Ethics & Public Policy*, *25*(1). https://doi.org/10.60154/jaepp.2024.v25n1p67
103. Sgantzos, K., Hemairy, M. Al, Tzavaras, P., & Stelios, S. (2023). Triple-Entry Accounting as a Means of Auditing Large Language Models. *Journal of Risk and Financial Management*, *16*(9). https://doi.org/10.3390/jrfm16090383
104. Sherif, K., & Mohsin, H. (2021). The effect of emergent technologies on accountant`s ethical blindness. *International Journal of Digital Accounting Research*, *21*, 61–94. https://doi.org/10.4192/1577-8517-v21_3
105. Shneiderman. (2020). Bridging The Gap Between Ethics And Practice: Guidelines For Reliable, Safe, And Trustworthy Human-Centered AI Systems. *ACM Transactions on Interactive Intelligent Systems (TiiS)*, *10*(4), 1–31.
106. Staszkiewicz, P., Horobiowski, J., Szelągowska, A., & Strzelecka, A. M. (2024). Artificial intelligence legal personality and accountability: auditors' accounts of capabilities and challenges for instrument boundary. *Meditari Accountancy Research*, *32*(7), 141–167. https://doi.org/10.1108/MEDAR-10-2023-2204
107. Tiron-Tudor, A., & Deliu, D. (2022). Reflections on the human-algorithm complex duality perspectives in the auditing process. *Qualitative Research in Accounting and Management*, *19*(3), 255–285. https://doi.org/10.1108/QRAM-04-2021-0059
108. Tiron-Tudor, A., Rodgers, W., & Deliu, D. (2024). The accounting profession in the Twilight Zone: navigating digitalisation's sided challenges through ethical pathways for decision-making. *Accounting, Auditing and Accountability Journal*. https://doi.org/10.1108/AAAJ-12-2022-6173

109. Tubing, A. M. (1950). MIND A QUARTERLY REVIEW OF PSYCHOLOGY AND PHILOSOPHY I.-COMPUTING MACHINERY AND INTELLIGENCE. *Computing Machinery And Intelligence*, *9*(236), 433–460. http://mind.oxfordjournals.org/
110. Vărzaru, A. A. (2022). Assessing the Impact of AI Solutions' Ethical Issues on Performance in Managerial Accounting. *Electronics (Switzerland)*, *11*(14). https://doi.org/10.3390/electronics11142221
111. Yoon, S. (2020). The Impact of New Technology on Ethics in Accounting: Opportunities, Threats, and Ethical Concerns. *Korean Management Review*, *49*(4), 983–1010. https://doi.org/10.17287/kmr.2020.49.4.983
112. Zhang, L., Yang, J., Cheng, Y., Zhao, J., Han, X., Zheng, Z., & Xu, X. (2024, May 2). *Artificial Intelligence Law of the People's Republic of China (Draft for Suggestions from Scholars)*. Center for Security and Emerging Technology. https://cset.georgetown.edu/publication/china-ai-law-draft/
113. Zhang, Zhu, W., Dai, J., Wu, Y., & Chen, X. (2023). Ethical impact of artificial intelligence in managerial accounting. *International Journal of Accounting Information Systems*, *49*. https://doi.org/10.1016/j.accinf.2023.100619
114. Zhou, Y., Xiao, Z., Gao, R., & Wang, C. (2024). Using data-driven methods to detect financial statement fraud in the real scenario. *International Journal of Accounting Information Systems*, *54*. https://doi.org/10.1016/j.accinf.2024.100693