

THE USE OF ARTIFICIAL INTELLIGENCE IN THE FIELD OF AUDITING - A MINI-STUDY

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Abstract

The adoption of artificial intelligence in control and auditing activities represents a fundamental shift in accounting control and audit practice. This paper investigates both the potential benefits and the difficulties associated with AI implementation in audit procedures, specifically its contribution to process automation, data analysis, error detection and predictive modelling. It explores the changes AI is bringing to the audit process through a multidisciplinary lens by examining its influence on accuracy, operational efficiency and data-driven decision-making in traditional audit activities. It also draws on relevant documented examples of implementation by global audit firms, stressing the importance of regulatory adaptation, enhanced professional competencies, and ethical principles and criteria for the use of artificial intelligence. The methodology for the present research is structured around the exploration of a series of documented examples of artificial intelligence implementation in audit processes. As a result, it becomes clear that the use of artificial intelligence is not a substitute for professional judgment, but acts as an important driver of transformation in the audit function, enabling it to cope with new challenges in a digitally evolving economy. The paper contributes multidisciplinary insight into the use of AI in the audit process by integrating academic theory, professional practice and scientific research, supported by existing evidence and a documentary comparison based on publicly reported examples showing how artificial intelligence transforms the audit function through data-driven analysis. This research, based on a preliminary exploration, offers a perspective on how this technology is transforming auditing, identifies new directions for future studies and may be relevant to professionals, researchers and stakeholders involved in education and training.

Keywords: *Data Analytics, Audit Reform, Professional Transformation, Risk Detection, Automation*

JEL Classification: *M42; O33; H83; D83*

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INTRODUCTION

AI is playing an increasingly important role in modern life. Current developments in AI and their effects across many sectors are becoming central to contemporary society, from virtual assistants and social networks' personalised recommendations to automated cars and the most sophisticated diagnostic medical systems. Growing international concern can be observed regarding the new interaction paradigm with the environment, as well as the profound transformation that Artificial Intelligence has introduced into human activities (Bostan, 2025). A brief consideration of the spheres of economic and social life most likely to come under the influence of artificial intelligence shows how the financial sector is already functioning as a "living laboratory" for AI: credit-scoring models, trading algorithms, risk-monitoring systems and anti-fraud tools. As argued by Danielsson et al. (2022), the extensive use of AI in the financial sector can generate a new kind of systemic risk; similar models, trained on similar data, react similarly in stress situations and amplify market movements, potentially causing widespread herd behaviour. There are two fundamental avenues for research deriving from these trends, namely: (i) increased efficiency, which means faster risk assessment, reduced transaction costs, personalised financial products, etc.; and (ii) new risks that are introduced: lack of model transparency, biases due to algorithms and increased dependence on a few concentrated digital infrastructures. At a macroeconomic level, this means the capacity for an error or a shock in one class of models to spread rapidly across the entire financial system. Hence, the financial sector will be both a major "beneficiary" of AI (in terms of efficiency and profit margins) and one of the spheres in which it is imperative for regulatory policy and supervisory authorities to adapt in the short term in order to avoid a systemic crisis amplified or caused by algorithmic dynamics. At least equally important is the "AI-augmented transformation" in public administrations. Tangi et al. (2025) introduce the concept of "AI-augmented

government transformation”, highlighting that the introduction of AI in the public sector will not only lead to the digitalization of procedures but also to a complete rethinking of the interaction between technology, organisations and decision-making systems.

As AI, by these researchers, the sectors in public administration that would be particularly impacted by AI include tax administration and public revenue, services to citizens, public order and justice, land management and territorial planning. It should be underlined that, in these fields, AI has a direct impact on the relationship between the citizen and the state and can have a dual effect: it can increase service quality and citizens’ access to services (Spatariu, 2025), or it can increase the perception of opacity and ‘algorithmic government’ if transparency, explainability and contestability are not guaranteed. During the OECD Global Anti-Corruption and Integrity Forum (2024), held with the participation of over 2,300 delegates from more than 125 countries, the importance of artificial intelligence in combating corrupt practices and the challenges of this technological development was underlined. The OECD has also encouraged the use of artificial intelligence and data analysis tools for detecting fraud and reinforcing systems designed to fight corruption. Within this context, the auditing profession is undergoing a significant transformation; the use of artificial intelligence is growing and is likely to become increasingly important. The research process adopted in this paper is outlined below and schematically illustrated in Figure 1.

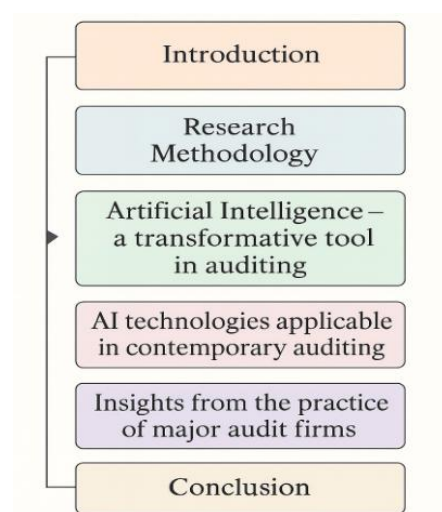


Figure 1. Research design. Source: Author’s elaboration.

Under conditions of rapid change and systemic pressure generated by the advent of artificial intelligence, auditing is a field in which adaptation is not a choice, but an imperative for strategic adjustment. Beyond the automation opportunities it offers, AI is already changing how risk assessment and data analysis are performed and how professional opinions are formed. Therefore, this work aims to evaluate how the implementation of artificial intelligence can improve quality and assurance in audit activities.

I. RESEARCH METHODOLOGY

The approach of this study is qualitative and exploratory in nature and is designed to capture and synthesize recent trends in the application of artificial intelligence to the audit process. The research can be considered a conceptual mini-study that connects recent academic findings with publicly reported practices of the Big Four firms. As a first step, a targeted and critical review of academic papers, books, technical reports, public policies (including OECD recommendations) and professional publications issued by international organisations between 2020 and 2025 was undertaken to establish current trends and identify the potential impact of AI development on audit processes. Additionally, the following AI technologies applied in auditing were considered and comparatively analysed at a conceptual level: expert systems, machine learning, natural language processing, fuzzy logic and robotic process automation, taking into account their development, potential and impact on professional practice. The overall research logic and design are presented in Figure 2, illustrating the progression from the literature review and conceptual comparison to the documentary analysis of practice.

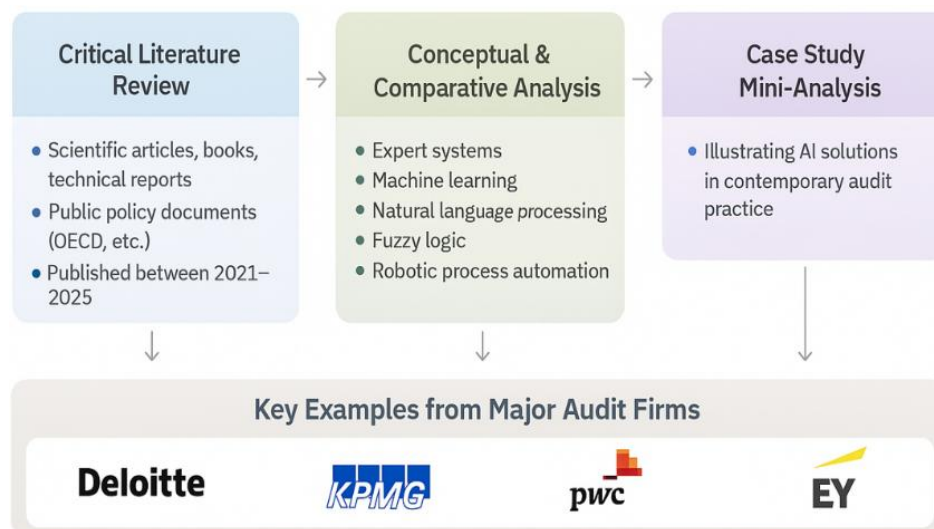


Figure 2. The Conceptual Framework of the Methodological Approach. Source: Author's elaboration.

The core part of the methodology consists of a comparative documentary analysis of publicly reported examples from the main international accounting firms Deloitte, KPMG, PwC and EY. These examples were examined solely on the basis of published literature and publicly available records to illustrate how artificial intelligence solutions are used by professionals to support audit-related tasks across different jurisdictions. Using the previous methods, the study provides multidisciplinary and structured insight into the transformation and future development of artificial intelligence in modern auditing.

II. ARTIFICIAL INTELLIGENCE – A TRANSFORMATIVE TOOL IN AUDITING

The contemporary world is undergoing rapid digitalisation, and the audit function is becoming increasingly dynamic as technological and organisational factors compel changes to core processes. Since the adoption of AI-based solutions in audit practice allows auditors to use a more integrated approach to evaluating risks, identifying deficiencies and reaching conclusions, numerous researchers are investigating this subject (Kokina et al., 2025; Bostan, 2024; Almufadda & Almezeini, 2022; Fotoh & Lorentzon, 2021). The findings of these studies are generally optimistic. Regardless of sector, senior leaders are increasingly investing in artificial intelligence, particularly generative AI, in an attempt to tap its value. However, introducing artificial intelligence and machine learning solutions in the audit function also leads to new levels of operational and professional complexity, that require careful professional and organisational responses. As shown in Figure 3, the adoption and auditability of AI systems introduce additional requirements involving domain knowledge, technological architecture, regulatory compliance and professional skills.

The issue is amplified by both a relatively low level of interest among higher education graduates in pursuing careers in auditing, and significant departures of professionals with prior experience from public accounting firms. This confluence of issues - a lack of new entrants combined with the loss of experienced staff - intensifies pressure on the sector to respond to the technological and regulatory changes prompted by AI adoption. In an era where effective modern auditing will require proficiency in analysing vast data sets, understanding algorithmic functioning and managing the ethical risks of deploying AI tools, a dearth of capable human capital presents a major strategic vulnerability. The proclivity of younger professionals to gravitate towards roles seen as more dynamic or technologically advanced – such as in FinTech, technology consulting or software development – exacerbates this mismatch between supply and demand for auditing expertise. Further eroding the appeal of the auditing profession is its long-held image of being rigid, bureaucratic and slow to embrace innovation, traits that contrast with the aspirations of young professionals seeking to have a quick and visible impact, exercise greater autonomy and acquire continuously evolving expertise.

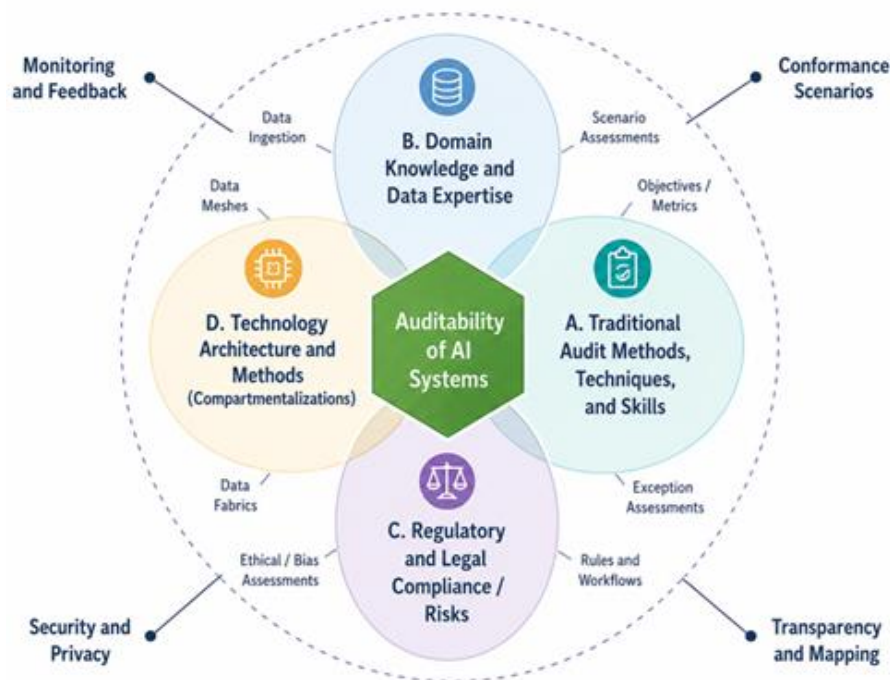


Figure 3. Holistic framework for the auditability of AI systems. Source: Adaptation after Dangelo (2023).

Structural issues concerning human capital development within auditing and young professionals' career choices were addressed at the YES Young EUROSAI Conference held in June 2024, which gathered young professionals and experts interested in the impact of AI in auditing from across Europe (Supreme Audit Office of Poland, 2024). The meeting highlighted the technical dimensions of the changes underway, as well as the human, cultural and organisational changes, stressing the urgent need to renew professional training and organisational cultures to align with the expectations of new generations and foster environments where digital competencies are valued and actively cultivated. The potential benefits of AI adoption in audit are summarised in Figure 4.



Figure 4. Potential advantages of leveraging AI in auditing. Source: Adaptation after Gautam (2024).

Nevertheless, AI is moving from being perceived merely as a technological solution and is becoming a more active participant in decision support, including in relation to problems that may be highly complex. In the context of auditing, AI, with its capability to handle vast amounts of data and learn from identified patterns, can improve analytical accuracy, while the underlying technologies continue to evolve. At the same time, accountants

and auditors are exploring how such technologies can be used to strengthen controls, combat fraud and improve compliance.

III. AI TECHNOLOGIES APPLICABLE IN CONTEMPORARY AUDITING

Among the AI instruments used in auditing are expert systems (ES), which can emulate the reasoning of human experts when addressing particular problems. They can be used in audit planning, audit evidence collection, risk assessment, final report writing, cost accounting, inventory control and management control system evaluations (Hasan, 2022). Continuous auditing involves the ongoing collection of electronic evidence to support an opinion on the financial statements (Hasan, 2022). Decision Support Systems (DSS) are computer-based information systems that support management decisions, simulate various scenarios and update suggestions under dynamically changing environments. Machine learning and neural networks (NN), which are computational models inspired by the human brain, can be utilized for analytical review, accounting data analysis and pattern identification. They can support the classification of audit transactions; meanwhile, Natural Language Processing (NLP) (Figure 5) technologies enable the automated reading of unstructured documents and help identify potential risk areas (Zhang et al., 2020).



Figure 5. AI-Driven Technologies in Auditing. Source: Adaptation after Venkata (2025).

Moreover, the use of fuzzy logic is a promising application; fuzzy logic brings the process closer to human reasoning because it uses degrees of truth rather than purely binary logic when auditing subjective issues involving uncertain financial information and managerial performance. This allows auditors to evaluate uncertain circumstances more flexibly, particularly in situations that have not been adequately addressed using other technologies (Hasan, 2022). Robotic process automation (RPA) can automate simple, repetitive and rule-based tasks such as: (i) data preprocessing; (ii) routine audit testing; and (iii) transaction reconciliation (e.g., invoices versus payments). The use of RPA can significantly accelerate routine activities. It can also enhance accuracy, free staff from simple tasks and enable auditors to spend more time on analysis and planning. The research literature increasingly focuses on the advantages of using hybrid systems comprising a collection of AI technologies (e.g., fuzzy logic, machine learning, expert systems and natural language processing). They may be among the most robust systems used in auditing because of their capabilities to handle quantitative and qualitative aspects of audits and to offer adaptability and flexibility in addressing the complexities of present audit environments characterized by diverse, large, heterogeneous and unstructured data resources. The combined use of AI technologies can improve the thoroughness, accuracy and relevance of audit analysis and conclusions.

IV. INSIGHTS FROM PUBLICLY REPORTED PRACTICES OF MAJOR AUDIT FIRMS

Within this area of research, publicly available sources describe how each of the Big Four audit firms has integrated artificial intelligence into its activities over the past few years. Deloitte's cognitive audit and risk assessment assistant provides an illustrative example. Table 1 presents a summarized comparison of the key technologies and supported functions reported by the Big Four, placing these examples within the broader range of technological implementations across the industry.

Table 1. AI Implementations Reported by Major Audit Firms.

Audit Firm	AI Tools & Technologies Used	Main Functions Supported	Key Benefits	Limitations / Risks
Deloitte	- Cognitive auditing tool - Machine learning for data structuring - Intelligent chatbot - RPA robot "Edgy" - Contract analysis AI system	- Risk assessment - Data structuring & integration - Advisory services - HR automation - Contract review	- Faster risk comparison - High-volume processing - Automation of repetitive tasks - Decision support	- Model opacity - Dependence on data quality - Need for upskilling
KPMG	- Unified AI platform - Cognitive computing - Advanced risk model - Tax analytics engine - Payroll tax automation	- Risk mapping - Tax audit automation - Reporting & analytics	- High processing speed - Consistent tax assessments - Enhanced risk visualization	- Implementation complexity - Misclassification risk - Cybersecurity vulnerabilities
PwC	- GLAI robot - Machine learning classifiers - Automation tools for reconciliations - Anti-bribery AI tools	- Journal entry testing - Financial analytics - Fraud detection - Compliance screening	- Emulates expert decisions - Automation of routine tests - Enhanced fraud detection	- Need for retraining - Bias in fraud detection - Infrastructure reliance
EY	- AI anomaly detector - Predictive analytics - Pattern recognition engine	- Fraud identification - Scenario analysis - Predictive financial analysis	- Early fraud detection - Improved efficiency - Strengthened digital audit model	- Pattern misinterpretation - Transparency concerns - Governance needs

Source: Author's elaboration based on Deloitte (2024), KPMG (2024), PwC (2024), and EY (2025).

Deloitte's solution was developed to help auditors compare risk approaches and to streamline the integration of data. It employs machine learning technology to assist with the organization and integration of data, and incorporates an intelligent chatbot that provides guidance on audit rules, legislation, and standards. Published sources indicate that Deloitte has already integrated machine learning technology across its operations, as seen by the deployment of the intelligent robot Edgy for robotic process automation (RPA) in human resources, and a self-learning application to review and interpret contracts to support risk advisory services (Zhang et al., 2020; Deloitte, 2024). Meanwhile, KPMG has adopted a comprehensive suite of AI tools on a unified platform, with an integrated stack of cognitive technologies. KPMG has adopted a novel approach to risk assessment and analysis, developing a methodology to assess and describe risks by considering severity, likelihood, interconnectedness and speed, in addition to employing a tax analysis tool capable of assessing tens of thousands of transactions within minutes. The firm also utilizes tools to streamline payroll tax processes and automatic exchange of information reporting (Zhang et al., 2020; KPMG, 2024). PricewaterhouseCoopers (PwC) provides a broad range of data and analytics services with technological solutions for information gathering, entity status assessment, financial statement review and the conversion of financial data into tax bases. The firm has worked with a tech partner to create the robot GL.ai, integrating AI technology into financial and accounting practices. GL.ai utilizes machine learning to draw on the knowledge and experience of professional auditors, enabling the tool to support conclusions and complex analysis. Additionally, PwC has developed technology to automate routine auditing procedures such as cash-flow balance checks, bank reconciliation, bank confirmation, currency conversion, among other tasks. It also provides AI technology for anti-bribery and anti-corruption reports and for journal entry analysis (Zhang et al., 2020; PwC, 2024). Ernst & Young (EY) has developed and implemented an AI tool that applies machine learning algorithms to detect erroneously or fraudulently recorded entries in accounting journals, which helps the firm quickly identify anomalies and mitigate risks of financial fraud. EY also leverages AI for predictive analytics to gain insights into financial behaviour, support business decisions and examine various scenarios. By using this technology, EY is enhancing its capabilities in digital auditing and moving towards an operationally efficient, data-driven audit model (Zhang et al., 2020; EY, 2025).

V. CONCLUSION

The findings of this mini-study support the view that AI is a structural driver of transformation in auditing. By introducing techniques such as machine learning, natural language processing, expert systems, fuzzy logic and robotic process automation (RPA), AI supports the transition from sampling-based processes to more comprehensive, predictive and data-driven procedures. The examination of publicly reported practices of the Big Four firms indicates a similar pattern in which AI technology is moving beyond experimentation and is increasingly used to assess risks, identify anomaly patterns, test evidence and automate routine activities. However, its growing use raises important strategic and ethical questions. The successful application of AI requires significant investment in technology, effective governance of AI algorithms and data, continuous upgrading of auditors' skills, algorithmic transparency, bias management, cybersecurity risk management, and the maintenance of public confidence, as increasingly reflected in national and international regulations. The research indicates that AI does not remove the need for auditors, but enhances the value of human judgement. In the face of the growing complexity of technology-enabled audit processes, human expertise is evolving towards interpreting the results of advanced analyses, managing and validating algorithms, and adding the higher-level judgement that machines cannot provide. The study concludes that AI technology, together with relevant competencies, robust governance and continuing professional education, could be an important tool for rethinking audit practice in order to achieve greater accuracy, transparency and relevance.

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Conflicts of interest: The author declares no conflicts of interest.

Ethics statement: This study is based exclusively on publicly available legal, institutional, policy and secondary academic sources. It does not involve human participants, interviews, surveys, experiments, personal data collection or clinical/biomedical material. Therefore, formal ethical approval was not required.

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