

Smart Financial Auditing: Ethical Challenges of Transparency, Privacy, and Algorithmic Bias

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Received: 07/04/2026

Accepted: 23/05/2026

Published: 05/06/2026

Abstract:

In light of the inevitable shift toward Smart Financial Auditing driven by the rapid proliferation of digital technologies, this study aims to analyze the ethical challenges posed by the integration of Artificial Intelligence into financial auditing, with a specific focus on issues of Transparency, Data Privacy, and Algorithmic Bias.

The study finds that while Smart Financial Auditing enhances audit efficiency, accuracy, and risk and fraud management, it introduces critical ethical challenges that impact the core principles of the profession. These challenges stem from the opaque nature of "black box" algorithms, data security vulnerabilities, and biased algorithmic outputs. To address these concerns, the study emphasizes the necessity of transitioning toward Responsible Financial Auditing by adopting comprehensive solutions. These include implementing Explainable Artificial Intelligence (XAI), auditing AI systems and algorithms, and enforcing rigorous cybersecurity measures. Furthermore, the study advocates for establishing robust governance and accountability principles, investing in training and capacity building for auditors, and developing clear regulatory frameworks. Such an integrated approach, combining technical and ethical dimensions, is essential to enhance integrity and objectivity while maintaining stakeholder trust in the digital era.

Keywords: Smart Financial Auditing, Artificial Intelligence, ethics, Transparency, Privacy, Algorithmic Bias.

JEL Classification : M42, M14, O33

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Introduction:

Against the backdrop of rapid digital transformations redefining the global business landscape, Artificial Intelligence (AI) has emerged as a revolutionary force, distinguished by its superior capacity for data processing, advanced analytics, and the automation of complex tasks. AI encompasses a sophisticated suite of technologies—including machine learning, natural language processing, and computer vision—that enable machines to learn from data, adapt to novel information, and execute tasks with increasing levels of refinement. The economic impact of this shift is profound; the market for Artificial Intelligence reached

approximately \$244 billion in 2025 and is projected to surpass \$800 billion by 2030 (Statista, 2025).

Most corporations are currently exploring or implementing AI to optimize operations, enhance efficiency, and drive revenue growth. Key trends include large-scale corporate integration to secure a competitive advantage, alongside an ongoing AI-driven workforce transformation, where new job creation is expected to outpace displacement.

The accounting and auditing sector has not remained isolated from these shifts; rather, it has undergone a radical transformation in its fundamental practices. Within corporate financial auditing, identifying and predicting high-risk areas is vital for ensuring financial Transparency, preventing fraud, and improving audit efficiency. However, traditional auditing methods face significant constraints in risk prediction due to the high dimensionality, variance, and complexity of financial data. To adapt to these changes, Smart Financial Auditing has been implemented as a pioneering approach, with auditors—particularly within the "Big Four" firms—strategically adopting Artificial Intelligence technologies.

Auditors utilize AI not only to streamline the financial audit process by automating routine tasks, such as data matching and document classification, but also to bolster effectiveness through advanced analytical capabilities that detect anomalies and fraud with unprecedented precision. Nevertheless, this rapid transition toward Smart Financial Auditing, despite its multifaceted benefits, introduces profound ethical and technical challenges that strike at the core of the profession's fundamental principles. While these technologies enhance the ability to process vast datasets, they raise serious concerns regarding the opacity of their mechanisms. This lack of clarity brings to the forefront critical issues surrounding Transparency, Data Privacy, and, ultimately, Algorithmic Bias, which can lead to erroneous or unfair conclusions.

Main Problem: *To what extent can Smart Financial Auditing reconcile the ethical challenges related to Transparency, Data Privacy, and Algorithmic Bias with the fundamental principles and integrity of the profession?*

Sub-Questions :

- What is Smart Financial Auditing, and what are the primary Artificial Intelligence technologies it employs?
- How can auditors ensure the understanding and interpretation of decisions made by AI algorithms?
- What measures are necessary to protect the Data Privacy of the Big Data processed during Smart Financial Auditing?
- Does the bias inherent in training data for AI algorithms lead to unfair or subjective audit decisions?
- What framework should be established to ensure the responsible use of Artificial Intelligence within the auditing profession?

Study Hypotheses :

- The adoption of a comprehensive framework governing the responsible use of AI in financial auditing enhances the profession's ability to balance ethical challenges with core professional principles.
- Integrating AI requires a shift in the human auditor's core competencies toward data analysis and emotional intelligence, ensuring the continued effectiveness of professional judgment.

Study Objectives :

- Conduct an in-depth analysis of the ethical challenges facing Smart Financial Auditing.
- Propose a comprehensive framework to ensure the responsible integration of AI into the Smart Financial Auditing profession.
- Examine the impact of AI integration on the role and skills of the human auditor, identifying new competencies required to sustain professional judgment.

Study Methodology: This research employs a descriptive-analytical approach to establish the conceptual framework of Smart Financial Auditing and its core AI applications. Additionally, in alignment with the study's scope, this approach is utilized to critically examine the ethical challenges arising from the use of AI in financial auditing -specifically transparency, data privacy, and algorithmic bias- and to develop a proposed governance framework based on international standards."

I. Smart Financial Auditing: Conceptual Framework:

1. The Concept of Smart Financial Auditing:

Financial auditing entails the examination of financial information and accounting practices within organizations to ensure compliance with legal and regulatory requirements. This process involves evaluating the completeness, accuracy, and integrity of financial records and internal controls (INTOSAI, 2020, p. 08). Crucial for public companies and regulated industries, financial auditing is conducted by both internal and external auditors in accordance with professional standards and guidelines. However, with the transition into the era of Big Data and Artificial Intelligence, traditional methodologies are no longer sufficient. This shift has necessitated the emergence of Smart Financial Auditing to provide more effective and proactive solutions.

Smart Financial Auditing is defined as the process of making audit work "intelligent" by utilizing Big Data and Artificial Intelligence as its core essence. This concept aims to design an intelligent auditing framework and a financial auditing platform based on deep learning and data mining techniques to resolve key bottlenecks in the audit process. These tasks include collecting and sorting diverse data, feature extraction, and the automated identification and analysis of anomalies, thereby enabling the system to handle various data types and autonomously generate audit indicators (Li, 2022, p. 399).

Furthermore, Smart Financial Auditing has been characterized as a modern auditing approach that arose in response to the limitations of traditional sampling-based

methods in meeting the demands of the digital age and the massive volume of financial data. This approach aims to enhance the effectiveness and efficiency of financial auditing through the active monitoring of the legality and integrity of organizational financial revenues and expenditures (Peng & Tian, 2023, p. 01). Consequently, Smart Financial Auditing can be defined as an advanced auditing approach that leverages Artificial Intelligence (AI), advanced Data Analytics, and Robotic Process Automation (RPA) to optimize the efficiency and accuracy of the audit cycle.

Rather than relying on manual sampling, smart auditing empowers auditors to analyze entire datasets (100% of transactions) continuously and in real-time, allowing for a faster and more comprehensive detection of abnormal patterns and potential risks. The primary objective of Smart Financial Auditing is to transform the audit process from a reactive function (occurring after events have transpired) into a proactive and predictive one. Major accounting firms are investing billions of dollars to develop AI systems to assist auditors in their mandates. For instance, **PwC**, one of the world's largest audit, consulting, and tax firms, plans to spend \$12 billion and hire 100,000 new personnel in fields such as Artificial Intelligence and cybersecurity by 2026 (Karmańska, 2022, p. 88).

The distinctions between Smart Financial Auditing and traditional financial auditing can be identified through several key dimensions, as illustrated in the following table:

Table 01: Distinctions Between Traditional Financial Auditing and Smart Financial Auditing

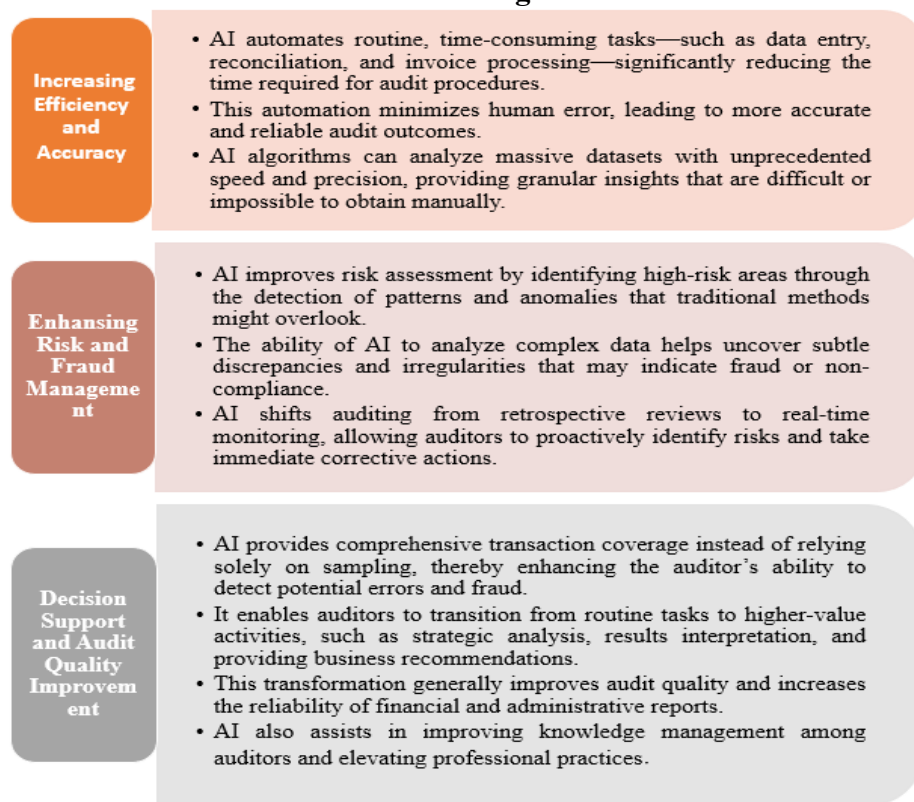
Key Aspects	Traditional Financial Auditing	Smart Financial Auditing
Scope of Analysis	Relies on manual sampling, which inherently risks overlooking material errors existing outside the selected sample.	Leverages comprehensive data analysis via Artificial Intelligence, providing a holistic and integrated view of all financial datasets.
Audit Timing	A periodic, reactive process conducted at fixed intervals (e.g., fiscal year-end); often identifying issues after they occur.	A continuous, real-time monitoring process that enables the immediate detection of anomalies and emerging risks.
Auditor Role	Primarily focused on routine, mechanical tasks such as data collection and manual review, which increases the susceptibility to human error.	Liberates the auditor from repetitive tasks to focus on strategic insights, complex risk assessment, and providing proactive recommendations.
Efficiency & Effectiveness	A labor-intensive and time-consuming approach that requires substantial human intervention.	Significantly enhances efficiency by automating tasks, thereby increasing the effectiveness of fraud and error detection.

Source: Prepared by the researcher based on (Supriadi, 2024, pp. 51-52-57)

2. Benefits of Utilizing Artificial Intelligence in Smart Financial Auditing:

Artificial Intelligence is fundamentally revolutionizing the auditing profession by significantly enhancing both the effectiveness and efficiency of financial audits. The advancements brought about by AI in the field of financial auditing can be categorized into three primary opportunities: advanced risk assessment, improved decision-making, and the augmentation of efficiency and accuracy through process automation (FIRAT, 2025, p. 81). These benefits are further illustrated in the following figure:

Figure 01: Benefits of Utilizing Artificial Intelligence in Smart Financial Auditing



Source: Prepared by the researcher based on (FIRAT, 2025, pp. 81-83), (Fidyah & et al, 2024, pp. 4352-4353)

Furthermore, a recent study conducted by **KPMG**, surveying 1,800 financial reporting executives across major economies, indicates that companies adopting Artificial Intelligence in their financial reporting achieve a broad spectrum of benefits that directly impact the financial auditing field. Two-thirds of leaders agree that the most prominent advantages include the ability to predict trends and impacts (65%), gaining real-time insights into risks (60%), making better data-driven decisions, and increasing data accuracy (57% for each).

In addition, the integration of Artificial Intelligence contributes to boosting the productivity of financial audit teams, alongside enhancing talent acquisition and skill development. Indeed, over 40% of companies reported an increase in employee

productivity and efficiency, with this figure projected to rise to 60% within the next three years. Executives also anticipate that AI will assist in attracting financial talent (rising from 36% currently to 47%), enhancing skills (from 32% to 42%), and addressing staffing shortages (from 27% to 36%) (KPMG, 2024, p. 05).

3. Artificial Intelligence Applications in Smart Financial Auditing:

The integration of Artificial Intelligence technologies is gaining increasing importance across various business sectors. This includes merging machine learning with Robotic Process Automation (RPA) or combining rule-based engines with machine learning. A survey conducted by EY in 2017 revealed that 74% of CEOs reported having no strategic plans regarding AI. However, only a year later, the same survey results showed that 73% of CEOs were either already adopting AI or planning to do so within the next two years. Moreover, statistics provided by the World Economic Forum indicated that 30% of all corporate audits would be performed by Artificial Intelligence by 2025. Additionally, the OECD has identified more than 200 blockchain-based initiatives in the public sector across 46 countries (ACCA, EY, 2019, p. 02).

Certain Artificial Intelligence technologies, such as Robotic Process Automation (RPA) and simple machine learning, are perceived as "Simple AI" due to their ease of use and the availability of ready-made tools for audit tasks. In contrast, more sophisticated technologies, such as deep neural networks and Generative AI, are classified as "Complex AI" because they require specialized technical expertise to develop and implement effectively. AI in financial auditing involves utilizing intelligent systems to analyze large datasets, detect anomalies, identify patterns, and assess risks. The primary technologies employed include Natural Language Processing (Wei, 2025), Machine Learning, Robotic Process Automation, and Generative AI (Kokina & et al, 2025, p. 03), which are further detailed as follows:

- **Natural Language Processing (NLP) Tools:** This technology enhances the audit process by enabling the analysis of unstructured data, such as emails, contracts, and meeting minutes. These tools can extract key terms, identify inconsistencies, and perform sentiment analysis, providing a broader context for the audited financial data. For instance, NLP can be utilized to compare sales agreements with reported revenues to ensure consistency and compliance.
- **Machine Learning (ML):** A fundamental AI technology that functions as a "prediction engine." It relies on building statistical models trained on vast amounts of historical data to forecast future outcomes. In accounting and auditing, Machine Learning can predict optimal financial resource levels or identify potential risks. Furthermore, it allows for the continuous auditing of full datasets instead of sampling, excels at extracting significant clauses from contracts, and flags cases requiring human investigation. Additionally, deep learning systems can perform physical inventory counts using image recognition techniques.

- **Robotic Process Automation (RPA):** This technology is widely used to automate repetitive tasks driven by structured data, which are prevalent in accounting and audit operations. RPA software can perform tasks such as automated evidence collection, report generation, data integration from multiple sources, and executing tests in programs like Excel. Although primarily rule-based, RPA is frequently integrated with Machine Learning to form "Intelligent Automation," enabling it to make more complex decisions and prioritize tasks more effectively.
- **Generative AI:** An advanced type of Machine Learning that utilizes deep learning models to create new content, such as text or code. In the context of accounting and financial auditing, it can be used to produce high-quality initial drafts of working papers and reports. However, it always necessitates rigorous guidance, review, and verification by a human accountant or auditor to ensure accuracy and reliability.

Generative AI represents the most advanced generation of Artificial Intelligence, offering several unique advantages compared to other technologies. Most companies believe that their external auditors will adopt Generative AI as a standard practice within an average of less than two years, utilizing it in several key ways (KPMG, 2024, p. 16):

- **Predictive Analysis:** Leaders expect their auditors to leverage the ability of Generative AI models to continuously adapt to new data and generate scenarios that demonstrate potential outcomes and impacts.
- **Speed of Execution:** Leaders want auditors to utilize Generative AI to identify trends, anomalies, and potential risks in real-time, thereby significantly enhancing response speed.
- **Document and Data Collection:** Leaders recognize that Generative AI can be particularly effective in document collection through automated data extraction, document classification and organization, as well as text analysis and summarization.

II. Ethical Challenges of Smart Financial Auditing:

The fundamental purpose of financial auditing is to enhance the degree of confidence of intended users in financial statements. In addition, the objective of auditing financial data is to enable the auditor to express an opinion on whether these statements have been prepared, in all material respects, in accordance with International Financial Reporting Standards (IFRS) or another identified financial reporting framework. The auditor's opinion is typically expressed through the phrases "give a true and fair view" or "present fairly, in all material respects." Distinct and separate responsibilities exist for both the auditor and the client's management; while the auditor is responsible for forming and expressing an opinion on the financial statements, the client's management bears the responsibility for their preparation and presentation. Notably, management's responsibilities are not diminished by the fact that the statements have been audited. The auditor must adhere

to the general principles of auditing, which require the following (The World Bank Group, 2011, p. 03):

- **Compliance with the Code of Ethics for Professional Accountants:** The auditor must adhere to the ethical rules established by the International Federation of Accountants (IFAC) or any applicable national code of ethics, ensuring that professional conduct aligns with the highest standards of integrity and objectivity.
- **Planning and Execution in Accordance with International Standards:** The auditor is obligated to conduct the audit process in accordance with International Standards on Auditing (ISAs), ensuring a unified and globally recognized operational methodology.
- **Professional Skepticism:** Throughout the audit process, the auditor must maintain an attitude of professional skepticism. This entails not taking matters at face value and recognizing the possibility that material misstatements may exist within the financial statements. This critical stance is essential for maintaining independence and objectivity.

Figure 02: General Challenges of Smart Financial Auditing

Requirement for High-Quality Data: Artificial Intelligence relies on accurate and complete data to function effectively. However, in practice, incomplete or biased data can lead to errors in machine learning, a phenomenon known as "Incomplete Data."

Fabricated Evidence and Working Papers: This challenge is intensifying due to the evolution of Artificial Intelligence tools that are no longer limited to text generation but can also create images, videos, and highly realistic audio recordings. This makes the detection of forged evidence or fabricated working papers extremely difficult, potentially leading to erroneous conclusions regarding financial data.

Over-reliance on AI Tools: Excessive dependence by auditors on Artificial Intelligence tools may lead to the erosion of human skills, resulting in the loss of professional skepticism and ethical personal judgment.

Resistance to Change and Skill Shortages: The lack of trained human capital is one of the most significant obstacles, alongside the natural resistance among auditors toward adopting new technologies.

Absence of Explicit AI Audit Standards: In addition to the lack of regulatory guidance, current regulations do not keep pace with the rapid development of Artificial Intelligence, leaving auditors unprepared to manage emerging risks.

Source: Prepared by the researcher based on (IRBA, 2024, p. 02), (Supriadi, 2024, p. 56), (Kokina & et al, 2025, pp. 13-14)

It is evident that financial auditing has traditionally been grounded in rigorous ethical principles. The auditor is committed to complying with the professional code of ethics and executes mandates in accordance with International Standards on Auditing (ISAs), all while maintaining a stance of professional skepticism to ensure objectivity. However, the emergence of Smart Financial Auditing has introduced a

novel set of challenges. While some of these challenges are general in nature—as illustrated in Figure 02—the most critical are the ethical challenges that directly impact the fundamental principles of the profession. These include Transparency, Data Privacy, and Algorithmic Bias.

1. Transparency- The Black Box Challenge:

The ability to interpret the outputs of Artificial Intelligence systems constitutes a significant issue, particularly when applied within the financial sector. Machine learning models are frequently referred to as "black boxes" because they are not directly interpretable by the user (Boukherouaa & et al, 2021, p. 15). Artificial Intelligence systems are also described as "Black Box" systems where inputs and outputs are known, yet end-users cannot easily discern the model's internal underlying mechanisms (Zhong & Goel, 2024, p. 01). This opacity threatens the principle of Transparency, which is fundamental to financial auditing; the absence of Transparency and interpretability in AI models makes it difficult to comprehend how core predictions and decisions are reached.

In addition, another challenge emerges regarding the instability of Artificial Intelligence models, where minor changes in data or algorithms can lead to vastly different results, even if the initial inputs are similar. This undermines the reliability required in the financial audit process, as auditors cannot depend on the system to yield consistent outcomes under identical circumstances. Additionally, the validity of AI models may be limited, meaning they might not perform well when encountering new, unseen data (Zhong & Goel, 2024, p. 02).

The inability to comprehend how Artificial Intelligence systems arrive at their conclusions undermines the auditor's principle of professional skepticism, rendering them unable to evaluate the reliability of results or identify potential sources of error. Moreover, the lack of Transparency limits the auditor's capacity to justify and explain their findings to clients and stakeholders, thereby weakening trust in both the tool utilized and the entire auditing process.

In the same vein, given that Transparency is a fundamental prerequisite for understanding how Artificial Intelligence systems make decisions, its absence directly impairs auditors' ability to achieve accountability. A core challenge in establishing responsibility arises when systems lack clarity, making it difficult to assign blame for errors or unintended consequences. Consequently, complex difficulties emerge in determining liability within the context of Smart Financial Auditing, including (Schweitzer, 2024, pp. 79-80):

- **Opacity:** Artificial Intelligence systems and complex neural networks are often opaque, hindering accountability. This makes it difficult for data auditors to identify errors, biases, or unintended consequences in automated decisions.
- **Regulatory Absence:** The lack of robust regulations governing Smart Financial Auditing leads to an accountability vacuum, creating ambiguity for developers, implementers, and users regarding their respective responsibilities.

- **Diffusion of Responsibility:** AI accountability blurs the lines of liability, as developers design algorithms, auditors integrate them, and users interact with their outputs. This diffusion makes it challenging to assign blame for negative outcomes and identify who is responsible for system-generated errors.
- **Rapid Evolution:** The swift advancement of Artificial Intelligence outpaces the development and enforcement of regulations, creating a moving target for accountability mechanisms in Smart Financial Auditing.
- **Training Data Bias:** Artificial Intelligence systems can perpetuate social inequalities due to biases in training data. This complicates the process of determining whether actions are biased or simply reflect pre-existing imbalances, particularly within the context of financial data analysis.

2. Data Privacy: The Data Security Challenge:

Data Privacy in the context of Artificial Intelligence refers to "protecting sensitive information, obtaining consent for data usage, ensuring model resilience to prevent leakage or disclosure of protected data, utilizing models in a privacy-respecting manner, and complying with emerging global laws and regulations that not only encourage but also mandate privacy" (Kokina & et al, 2025, p. 13)

The integration of Artificial Intelligence into financial auditing raises significant concerns regarding client confidentiality and data security. Primarily, AI often requires access to vast amounts of sensitive corporate data, which creates inherent security risks. Consequently, apprehensions arise concerning the collection, storage, and utilization of such data, particularly when it pertains to employees' personal information or sensitive financial records (Supriadi, 2024, p. 56). Moreover, the application of Artificial Intelligence in financial audit processes heightens concerns over data security, the risk of data breaches, and digital fraud. This is especially pertinent in the fields of Robotic Process Automation (RPA) and Intelligent Automation (IA), where the processing of sensitive datasets can exacerbate these risks (FIRAT, 2025, p. 86).

The auditor bears a professional and ethical responsibility to maintain the confidentiality of client information. Consequently, any unauthorized breach or disclosure of data is not merely a technical failure but a violation of the auditor's fiduciary and ethical obligations. Although frameworks such as the General Data Protection Regulation (GDPR) exist, security vulnerabilities in information protection persist during audit procedures. Often, end-to-end encryption systems are unavailable, and significant risks remain within cloud-based storage environments (ŞAHİN & EVDİLEK, 2025, p. 56).

Based on the aforementioned, it can be argued that the issue of Data Privacy and security in Smart Financial Auditing is as much an ethical challenge as it is a technical one. At its core, this issue intersects with the ethical foundations of the auditing profession; it is no longer just a technical hurdle regarding information protection, but rather a test of auditors' commitment to the fundamental principles of integrity and honesty. This is evident through several key points:

- **Violation of the Confidentiality Principle:** Confidentiality is a cornerstone of the auditing profession. Auditors receive highly sensitive financial

information from their clients, and the pledge to maintain its secrecy is the essence of a trust-based relationship. When Artificial Intelligence is employed, this data is fed into systems that may not be sufficiently secure or stored in cloud environments vulnerable to breaches, exposing it to leakage risks. Such a breach is not just a security incident; it is a violation of the ethical covenant made by the auditor.

- **Professional Responsibility:** Auditors have an ethical duty to ensure that the tools they utilize are secure and reliable. If the use of an insecure Artificial Intelligence tool leads to a client data leak, the auditor has failed to exercise due professional care. This failure is not merely technical but constitutes a breach of both professional and ethical duties.
- **Erosion of Trust:** The relationship between the auditor and the client is fundamentally built on trust. If a client loses confidence in the auditor's ability to protect sensitive information, the very foundation of the professional relationship is undermined, potentially leading to the loss of the client. Therefore, maintaining Data Privacy is essential to protecting the auditor's most valuable assets: their reputation and client trust.

3. Algorithmic Bias: The Biased Data Challenge:

Algorithmic Bias, or embedded bias, is defined as computer systems that systematically and unfairly discriminate against certain individuals or groups in favor of others (Simon, Wong, & Rieder, 2020). Algorithms and models reflect the objectives and perspectives of those who develop them, as well as the data used for their training. Consequently, Artificial Intelligence tools can mirror or "learn" the biases inherent in the society in which they were created. This represents one of the most significant ethical challenges, as biased historical data can lead to skewed and unfair outcomes. There are five primary sources that fuel biases within Artificial Intelligence systems applied in Smart Financial Auditing (Murikah, Nthenge, & Musyoka, 2024, p. 04):

- **Data Scarcity:** The presence of errors or a lack of diversity within the training datasets.
- **Demographic Homogeneity:** Training on data that represents a limited population group, which leads to the marginalization of others.
- **Spurious Correlations:** The use of proxy variables that correlate with protected characteristics, such as race or gender.
- **Inappropriate Comparisons:** Utilizing unfair reference groups that reinforce existing disparities.
- **Cognitive Biases:** Flawed assumptions and misconceptions held by the system designers themselves.

Artificial Intelligence algorithms rely heavily on training data to make decisions and conduct predictions. Consequently, if this data is biased or non-representative, it may perpetuate or amplify pre-existing biases within the audit outputs. For instance, inherent biases in historical financial data or transaction patterns can lead to skewed risk assessments or inaccuracies in anomaly detection, potentially undermining the

fairness and objectivity of financial audit conclusions (Fidyah & et al, 2024, p. 4353).

Algorithmic Bias in Smart Financial Auditing is considered a fundamental ethical challenge because it directly impacts the foundations of the auditing profession, which is built upon principles of objectivity and fairness. This can lead to the following :

- **Skewed Risk Assessments:** The system may identify certain types of transactions or clients as carrying higher risks based on biased data, rather than objective financial facts.
- **Unfair Decisions:** Bias can result in conclusions that unfairly affect specific groups, thereby weakening the principle of justice.
- **Unreliable Results:** The foundation of trust in audit outcomes collapses when it cannot be guaranteed that decisions are objective and free from bias.

Ultimately, it can be emphasized that Algorithmic Bias is not merely a technical error but an ethical challenge that threatens the entire credibility of the Smart Financial Auditing process. This imposes an ethical responsibility on auditors to ensure that the tools they utilize are fair and unbiased.

III. Toward Smart and Responsible Financial Auditing: Proposals for Adopting an Ethical AI Framework:

Trust serves as the cornerstone for the adoption of Artificial Intelligence in the financial auditing; a trustworthy system must be fair, robust, privacy-preserving, accountable, transparent, and interpretable. Accordingly, the integration of Artificial Intelligence into financial auditing is no longer limited to technical advantages and efficiency, but extends to the necessity of building responsible AI systems that adhere to ethical standards. The concept of "Responsible AI" aims to place the human at the center of attention, ensuring user trust by adopting ethical decision-making methods. This decision-making process must be fair, accountable, unbiased, well-intentioned, non-discriminatory, and compliant with laws and societal norms. Responsible AI ensures that automated decisions are explainable to users while consistently maintaining Data Privacy through secure implementation (GOLLNER & et al, 2024, p. 46).

Adopting this integrated approach is the key to ensuring that technological advancement in the financial auditing profession does not come at the expense of core ethical values, but rather reinforces them. International frameworks have clearly defined the characteristics of this approach; notably, the **OECD** principles serve as a global reference, outlining five fundamental principles for the responsible stewardship of Artificial Intelligence (OECD, 2024): inclusive growth, sustainable development, and well-being; respect for the rule of law, human rights, and democratic values, including fairness and Data Privacy; Transparency and explainability; robustness, security, and safety; and accountability. These principles represent the first intergovernmental standard for trustworthy AI. Since their signing in 2019, nations have utilized them as a guide for formulating policies to address AI risks and capitalize on opportunities. Within the context of Smart Financial Auditing,

these principles provide guidance on mitigating risks and leveraging opportunities, ensuring that national AI strategies align with unified ethical standards.

In contrast, the European Commission has introduced a more detailed set of principles that Artificial Intelligence systems must fulfill, applicable to all stakeholders. These principles include (European Commission, 2019):

- **Human Agency and Oversight:** AI systems should empower humans, allowing them to make informed decisions and enhancing their fundamental rights. Simultaneously, appropriate oversight mechanisms must be ensured.
- **Technical Robustness and Safety:** AI systems must be resilient and secure. They must ensure a fallback plan in case of error, while remaining accurate, reliable, and reproducible. This is the primary method to ensure that unintended harm is minimized and prevented.
- **Privacy and Data Governance:** In addition to ensuring full respect for Data Privacy and data protection, appropriate data governance mechanisms must be guaranteed, taking into account data quality and integrity, and ensuring legitimate access to data.
- **Transparency:** Data, systems, and AI business models must be transparent. Traceability mechanisms can assist in achieving this. Furthermore, AI systems and their decisions must be explained in a manner adapted to the relevant stakeholders. Humans need to be aware that they are interacting with an AI system and must be informed of the system's capabilities and limitations.
- **Diversity, Non-discrimination, and Fairness:** Unfair bias must be avoided, as it can have multiple negative effects, from marginalizing vulnerable groups to exacerbating prejudice and discrimination. By promoting diversity, AI systems should be accessible to everyone, regardless of disability, and involve relevant stakeholders throughout their entire lifecycle.
- **Societal and Environmental Well-being:** AI systems must be sustainable and environmentally friendly, considering the environment and other living beings, as well as their social and societal impact for the benefit of all humans, including future generations.
- **Accountability:** Mechanisms must be established to ensure responsibility and accountability for AI systems and their outcomes. Auditability, which enables the assessment of algorithms, data, and design processes, plays a key role in this, particularly in critical applications. Moreover, adequate redress must be ensured.

These international frameworks provide auditors with a comprehensive ethical framework that integrates technical and ethical dimensions. This integration ensures that the use of Artificial Intelligence in financial auditing enhances integrity and objectivity while maintaining stakeholder trust. Based on this holistic framework, a set of practical proposals can be presented, aiming to transform these theoretical principles into a tangible reality within the Smart Financial Auditing environment.

1. Adopting Explainable Artificial Intelligence (XAI):

In light of the risks associated with Artificial Intelligence and the urgent need to develop reliable and accountable systems, the field of Explainable Artificial Intelligence (XAI) has emerged with the objective of producing more transparent and interpretable models. This field is a sub-discipline of AI that focuses on simplifying complex algorithms to enhance interpretability, Transparency, fairness, and reliability, while maintaining high levels of performance and accuracy. XAI is defined as the capacity of Artificial Intelligence systems to provide clear and understandable explanations for their actions and decisions. Its primary goal is to make the behavior of these systems comprehensible to humans by elucidating the underlying mechanisms of their decision-making processes. Ideally, XAI should encompass the ability to explain system competencies, its historical actions, ongoing processes, and forthcoming steps, while disclosing the relevant information upon which its actions are based (Vitor, 2023, p. 03).

Notably, XAI serves as a technical solution to the challenge of providing explanations for models that exceed human comprehension due to their complexity. These explanations range from individual clarifications—which explain specific outputs of "black box" models—to collective explanations that reveal broader patterns within these opaque systems (Ganatra & et al, 2024, p. 06). Within the context of Smart Financial Auditing, providing professional auditors with knowledge of XAI is paramount, given the current knowledge gap. Integrating an interpretability layer using XAI methods can offer valuable insights into model predictions and decision logic. This is particularly crucial for auditors who rely on the validity and clarity of AI outputs to make informed decisions (Zhong & Goel, 2024, p. 02).

Accordingly, the necessity for auditors to understand AI decision logic makes interpretability a fundamental requirement to support professional judgment and responsibility in Smart Financial Auditing. By making AI models more explainable, auditors will be able to grasp the logic behind decisions, thereby enhancing their trust in the tool. Furthermore, it supports professional judgment and critical skepticism, ensuring that Artificial Intelligence functions as a supportive tool rather than a replacement for human expertise. Most importantly, this field contributes to achieving accountability, as it becomes possible to trace the decision path and assign responsibility when errors occur—providing a direct solution to the "black box" challenge facing the auditing profession.

2. Implementing Cybersecurity Measures:

Artificial Intelligence algorithms require access to vast amounts of sensitive financial and operational data to ensure the effectiveness of their analytics. Ensuring the confidentiality and integrity of this data presents significant challenges, particularly in light of stringent data protection regulations, such as the General Data Protection Regulation (GDPR) in Europe. Accordingly, responsible data handling and the implementation of effective cybersecurity measures are essential to mitigate risks associated with unauthorized access or data breaches during AI-driven financial audit processes. This necessitates the application of end-to-end encryption systems,

data anonymization, and robust access controls to protect data and its confidentiality during both transmission and storage (Patel & et al, 2023, p. 11).

In the same vein, it is crucial to activate strict access controls based on the "Least Privilege" principle—which grants a user or system only the minimum level of permissions required to perform its function. Moreover, regular security audits must be conducted on the Artificial Intelligence systems themselves. Beyond the technical dimensions, this approach should extend to investing in continuous training for auditors to enhance their awareness of cyber risks and best practices in information protection.

3. Auditing Artificial Intelligence Systems and Algorithms:

The auditing of Artificial Intelligence systems and algorithms is an emerging field, often referred to in the literature as "Algorithmic Auditing," serving as a mechanism to detect and mitigate discrimination and other problematic consequences of algorithmic usage. Interest in algorithmic auditing has surged alongside the increasing capabilities and power of opaque "black box" algorithms that drive decision-making processes and impact both individuals and organizations (Minkinen, Laine, & Mäntymäki, 2022, p. 04).

Reviewing Artificial Intelligence systems is an imperative necessity to ensure their legality, technical robustness, and ethical design and implementation. Consequently, regulatory bodies and corporations have begun designing frameworks for auditing AI systems and establishing guidelines for audit activities (e.g., European Union 2022; UK Information Commissioner's Office 2020). Notably, the auditability of Artificial Intelligence systems is of paramount importance, as it is the key to addressing critical issues such as Algorithmic Bias and security risks. Specifically, an auditor can examine the training data to ensure it is free from bias, while also verifying the absence of security vulnerabilities. This auditability constitutes a fundamental prerequisite for enabling auditors to perform effective AI audits, and it directly influences the workload and quality of audit engagements (Li & Goel, 2024, pp. 02-13).

4. Investing in Training and Capacity Building:

The over-reliance of auditors on Artificial Intelligence tools represents a challenge that rivals the technical difficulties associated with their design. To address this issue, investing in training and capacity building for auditors serves as a pivotal solution. Initially, these tools are introduced as non-mandatory options to bolster auditors' confidence in them. Organizations recognize the human tendency to rely on technology; consequently, solutions are designed to prevent such dependence, such as requiring the verification of AI output accuracy through additional procedures. Furthermore, auditors are required to exercise their professional judgment in determining the extent of reliance on Artificial Intelligence. They are provided with clear training and guidelines that define permissible levels of reliance and the supplementary work needed to validate results. Emphasis is also placed on the necessity for auditors to maintain professional skepticism and critical thinking when interpreting AI outputs, while understanding data sources and flows. Ultimately,

focus must be directed toward designing audit support systems that minimize the erosion of professional skills (Kokina & et al, 2025, p. 14)

Accordingly, it can be argued that investing in training and capacity building for auditors is the cornerstone for addressing human-factor challenges in Smart Financial Auditing. This approach transcends merely teaching auditors how to operate technical tools; it focuses on equipping them with a profound understanding of how Artificial Intelligence systems function, their capabilities, limitations, and potential biases. This includes building their capacity to enhance professional skepticism and critical thinking, which is essential to prevent excessive reliance on AI outputs and the subsequent decline in professional skills. Thus, this approach ensures that auditors remain at the center of the decision-making process, utilizing Artificial Intelligence as a supportive tool that reinforces their professional judgment and expertise, rather than replacing them.

5. Establishing Governance and Accountability Principles:

Establishing governance and accountability principles is a fundamental pillar for ensuring the reliability and integrity of Artificial Intelligence systems, as financial auditors face the challenge of managing opaque AI tools and determining liability for their outcomes. AI governance refers to the structures, processes, and procedures implemented to direct, manage, and monitor Artificial Intelligence activities within an organization. It aims to establish supervisory frameworks that ensure smart systems are designed and utilized in alignment with professional and ethical standards. Furthermore, governance helps ensure that AI activities and decisions are consistent with the organization's values and its social and legal responsibilities (IIA, 2024, p. 12)

Simultaneously, accountability focuses on defining clear responsibility for any decisions or outputs generated by these systems. This approach assists in demystifying the "black box" by mandating Transparency, where developers are required to clarify algorithmic functions and identify the parties responsible for the integrity of financial data and its outputs. This must be coupled with ensuring that the audit team overseeing the AI possesses the necessary skills and expertise. Consequently, governance and accountability ensure that Artificial Intelligence functions as a reliable and responsible tool, thereby bolstering auditors' confidence in technology-supported decisions and maintaining the integrity of the financial auditing profession.

6. Designing Regulatory Frameworks:

As Artificial Intelligence continues to evolve, regulatory frameworks and ethical guidelines must also advance. For instance, new standards should be established to regulate the use of AI in auditing, ensuring system Transparency, accountability, and alignment with current financial reporting standards. This becomes particularly vital as AI tools gain greater autonomy and deeper integration within audit processes (Jayarathna, 2025). Accordingly, the International Federation of Accountants (IFAC) emphasizes an urgent need for updated regulations that address the ethical implications of Artificial Intelligence in auditing. These regulations must ensure that AI systems are designed and utilized in a manner that

minimizes biases, guarantees fairness, and holds developers accountable for their algorithms. Moreover, auditors must be equipped with the necessary knowledge and tools to understand and mitigate these ethical concerns.

Conclusion:

The integration of Artificial Intelligence into financial auditing represents a fundamental shift in how audits are conducted, transitioning from traditional labor-intensive methods to processes that are more data-driven, efficient, and real-time. Artificial Intelligence has proven to be more than a mere supplementary technology; it is a transformative force reshaping the scope and depth of auditing operations. Through this study, the following results have been reached :

- Smart Financial Auditing is a modern auditing approach that emerged as a response to the limitations of traditional sampling methods in meeting the demands of the digital age and the vast volume of financial data. Its primary goal is to transform the audit process from a reactive function (occurring after events) into a proactive and predictive one.
- Artificial Intelligence is revolutionizing the auditing profession by improving the effectiveness and efficiency of financial audits. The advancements made by AI in financial auditing can be categorized under three key opportunities: risk assessment, decision-making, and increasing efficiency and accuracy through automation.
- Smart Financial Auditing involves the use of intelligent systems to analyze large datasets, detect anomalies, identify patterns, and assess risks. Key technologies utilized include Natural Language Processing (NLP), Machine Learning (ML), Robotic Process Automation (RPA), and Generative AI.
- Although financial auditing is traditionally built on strict ethical principles, the emergence of Smart Financial Auditing has introduced new challenges. While some are general—such as the need for high-quality data, resistance to change, and skill shortages—the most significant are the ethical challenges that impact the core principles of the profession, including Transparency, Data Privacy, and Algorithmic Bias.
- Analysis of international AI frameworks shows a global consensus on the necessity of building trustworthy Artificial Intelligence systems. Nations and organizations, such as the OECD and the European Commission, have established ethical guidelines to ensure these systems are fair, transparent, secure, and accountable. Within the context of Smart Financial Auditing, these principles serve as a primary reference for addressing ethical challenges, thereby bolstering trust in audit outcomes and ensuring that technological evolution aligns with professional and ethical standards.

- Accuracy, Transparency, and reliability are paramount. To address these challenges, it is essential to develop more transparent and explainable AI models (XAI). This approach aims to align AI advancements with the fundamental principles of auditing, enhancing auditors' trust in the use of AI technologies.
- The future of Smart Financial Auditing requires adopting integrated solutions at multiple levels to counter various ethical challenges. It is imperative to audit AI systems and algorithms themselves, while implementing rigorous cybersecurity measures to protect sensitive data and ensure Data Privacy. From a governance perspective, establishing clear accountability principles is pivotal to ensuring responsibility for AI decisions, necessitating the design of strict regulations. Ultimately, the solution must be human-centric, requiring investment in training and capacity building for auditors to enhance their professional skepticism and critical thinking, ensuring they use AI as a supportive tool rather than a replacement for their expertise.

Accordingly, the study's hypotheses were confirmed, demonstrating that adopting a comprehensive ethical framework enhances the profession's ability to balance innovation with integrity, and that the integration of AI necessitates a shift in auditor competencies. Based on the findings, the following recommendations are proposed:

- To ensure the effective and secure integration of Artificial Intelligence into Smart Financial Auditing, cooperation must be strengthened between key stakeholders: human auditors, AI developers, data scientists, and regulatory bodies.
- Current and future ethical challenges must be addressed proactively to fully leverage AI's potential, ensuring that Smart Financial Auditing processes remain transparent, reliable, and maintain their ethical integrity.
- Academic institutions and professional training bodies should restructure accounting and auditing curricula to include specialized topics in Artificial Intelligence and Data Science, ensuring that the new generation of financial auditors is equipped with the technological skills necessary to navigate the challenges of Smart Financial Audit.

Glossary:

- **Artificial Intelligence (AI):** Technologies that enable machines to perform tasks that typically require human intelligence, such as learning, analyzing data, and making decisions.
- **Explainable AI (XAI):** AI techniques that make the decisions of "black box" models understandable and transparent to human users.
- **Algorithmic Bias:** Systematic and unfair discrimination in AI outputs, resulting from biased data or flawed algorithms, leading to unjust outcomes.

- **Black Box:** A model whose internal workings are too complex to be understood by humans, making its decisions difficult to explain or trust.
- **General Data Protection Regulation (GDPR):** A European Union law that sets strict rules for collecting and processing personal data to protect individual privacy.

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