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INTEGRATING AI ALGORITHMS INTO FINANCIAL AUDITS: A DISRUPTIVE APPROACH TO FRAUD DETECTION

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Summary
A systematic analysis of the scientific literature related to the incorporation of Artificial Intelligence in financial audits and its use in fraud identification was carried out, following the PRISMA methodology (Recommended Reporting Objects for Systematic Evaluations and Meta-Analysis). The main purpose of this study was to describe the publications registered in the Scopus and WoS databases, assessing their scope and relevance in the investigation of the suggested variables.
The initial search process detected 41 linked publications, which were examined and filtered using specific keywords: ARTIFICIAL INTELLIGENCE, FINANCIAL AUDITS and FRAUD. After eliminating duplicates and applying inclusion and exclusion criteria, a final corpus of 15 documents was established for exhaustive analysis. This set of articles facilitated the exploration of the most prominent trends in research, the most employed methods, and the growing fields in the use of artificial intelligence algorithms for the identification of financial anomalies.
The findings of this review provide a comprehensive perspective of scientific progress in this area, emphasizing both the possibilities and challenges associated with the implementation of these revolutionary technologies in the professional practice of auditing. Likewise, the analysis helps to understand how artificial intelligence can strengthen financial control and transparency systems, laying the foundations for future research and practical suggestions in this field.

Keywords: Artificial Intelligence, Financial Audits, Fraud.

1. Introduction

In the current situation, digitalization has permeated various economic sectors, providing revolutionary instruments that are transforming conventional processes (Pérez González, Solana-González, & Trigueros Preciado, 2018). Specifically, the financial and auditing sector has undergone a considerable transformation with the adoption of cutting-edge technologies, such as Artificial Intelligence (AI) algorithms. Not only do these tools automate procedures, but they also enable greater accuracy and efficiency in essential tasks such as the identification of financial fraud, a constant problem that impacts economic stability and trust in institutions.

Financial fraud is a permanent challenge for entities and regulators, with effects that go beyond economic losses and damage the reputation and sustainability of companies. Despite advances in regulations and auditing techniques, conventional methods are often insufficient to detect complex or hidden patterns in large amounts of information (Vilcherrez, 2020). In this context, artificial intelligence emerges as a revolutionary answer by facilitating the mass analysis of data and the detection of irregularities with an accuracy never seen before.

The incorporation of artificial intelligence algorithms in financial audits not only improves the procedures for detecting anomalies, but also raises ethical and technical questions regarding their application (Galán-Toral & Torres-Palacios, 2024). Elements such as the clarity of models, the ability to interpret results and the reliability of automated decisions are fundamental issues that need a detailed discussion in the academic literature. In addition, opposition to change by conventional entities and auditors highlights the importance of a strategic approach to the implementation of these technologies.

In this framework, academic studies have begun to examine the different applications of Artificial Intelligence in the financial sector, highlighting its ability to turn audits into a more solid procedure and adjusted to the complexities of the contemporary world (Salvatierra, 2024). However, the scientific production linked to this issue is dispersed in different fields of study, which complicates its consolidation and exhaustive analysis.

This article aims to address this inequality through a systematic review of the scientific literature published in journals indexed in Scopus and WoS. Through the PRISMA method (Recommended Report Objects for Systematic Evaluations and Meta-Analysis), it seeks to recognize the trends, challenges and possibilities linked to the implementation of artificial intelligence algorithms in financial audits for fraud identification. This method will enable a meticulous and organized assessment of existing scientific evidence, ensuring the inclusion of relevant and excellent quality research.

The main purpose of this study is to offer a comprehensive view of the scientific contributions in this field, highlighting both the progress and the restrictions detected in the literature. In addition, it seeks to promote the debate on the adoption of these technologies and their influence on professional practice, underlining the relevance of a regulatory and ethical framework to guide their evolution and implementation.

Thus, this article will not only contribute to the expansion of academic knowledge about the incorporation of Artificial Intelligence algorithms in financial audits, but will also provide conceptual and practical tools for innovation in this field. Therefore, it seeks to foster a radical change that strengthens trust in financial systems and enhances their ability to face future challenges.

2. General objective

To examine, through a systematic analysis with PRISMA methodology, the scientific studies published in journals indexed in Scopus and WoS on the incorporation of artificial intelligence algorithms in financial audits, with the aim of detecting trends, challenges and opportunities linked to their use in fraud identification.

3. Methodology

This research is qualitative in nature. According to Hernández, Fernández, and Baptista (2015), qualitative methods focus on the collection, analysis, and interpretation of data to understand and examine particular phenomena in detail. This analysis was based on the exploration and examination of relevant scientific studies on the incorporation of artificial intelligence algorithms in economic audits and the identification of fraud. The main data sources used were Scopus and WoS (Web of Science), using the keywords ARTIFICIAL INTELLIGENCE, AUDITS FINANCIAL and FRAUDS.

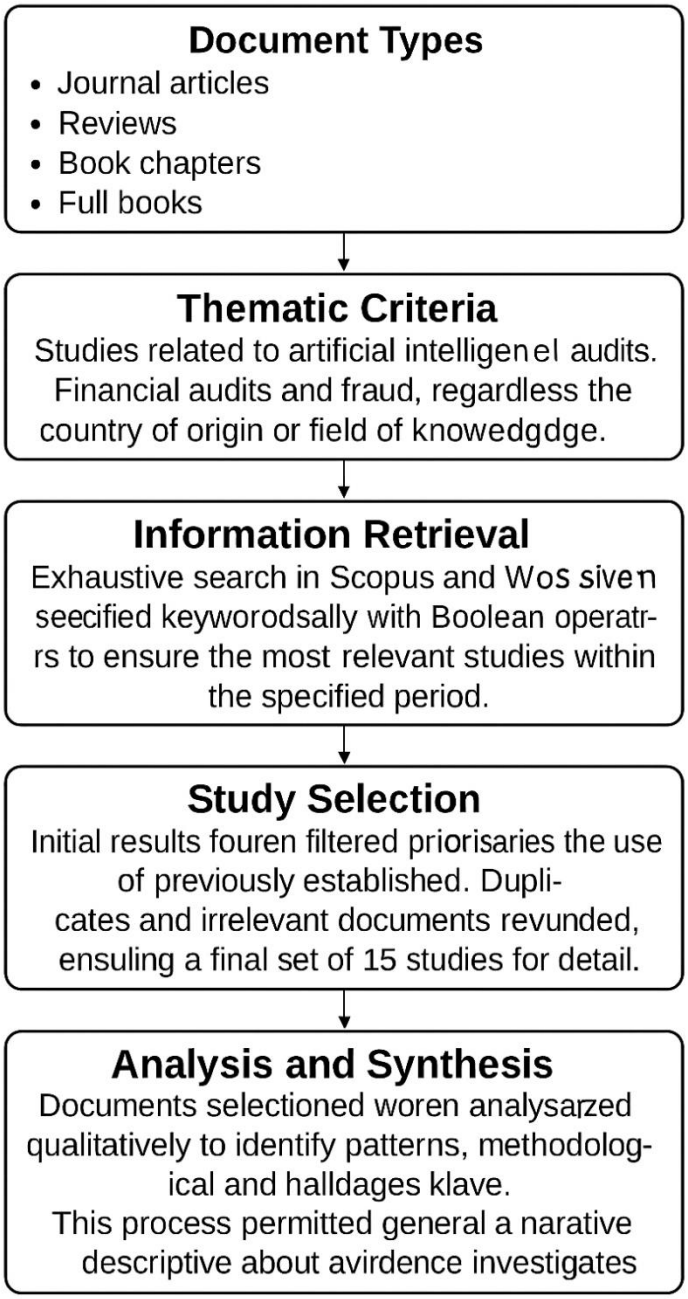
3.1 Research design

The methodology used was a Systematic Review, based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach, which offers an organized set of guidelines to carry out strict and repeatable reviews. According to Strauss

and Corbin (2016), a systematic review entails a process of coding and analysis that facilitates the creation of a methodical and descriptive narrative. This method was justified by the need to recognize, categorize, and examine the relevant literature on the variables of interest, offering a comprehensive perspective of research trends and gaps in the field.

The study was structured in the following stages:

Definition of scope and inclusion/exclusion criteria:



3.2 Using the PRISMA approach

The PRISMA method was essential to ensure transparency and sequencing of the process. Figure 1 shows this method, which shows the process of identification, choice and inclusion of the materials studied. The four essential stages of the PRISMA scheme were carried out: identification, evaluation, choice and inclusion. This method facilitated strict management of information and documentation at each stage of the procedure.

The implementation of extensive criteria regarding the type and provenance of publications ensured an inclusive vision, while the limited period to 2018-2022 facilitated the inclusion of recent and relevant research. This tactic satisfies the requirement to strengthen the latest scientific evidence on artificial intelligence and its influence on financial audits and fraud identification.

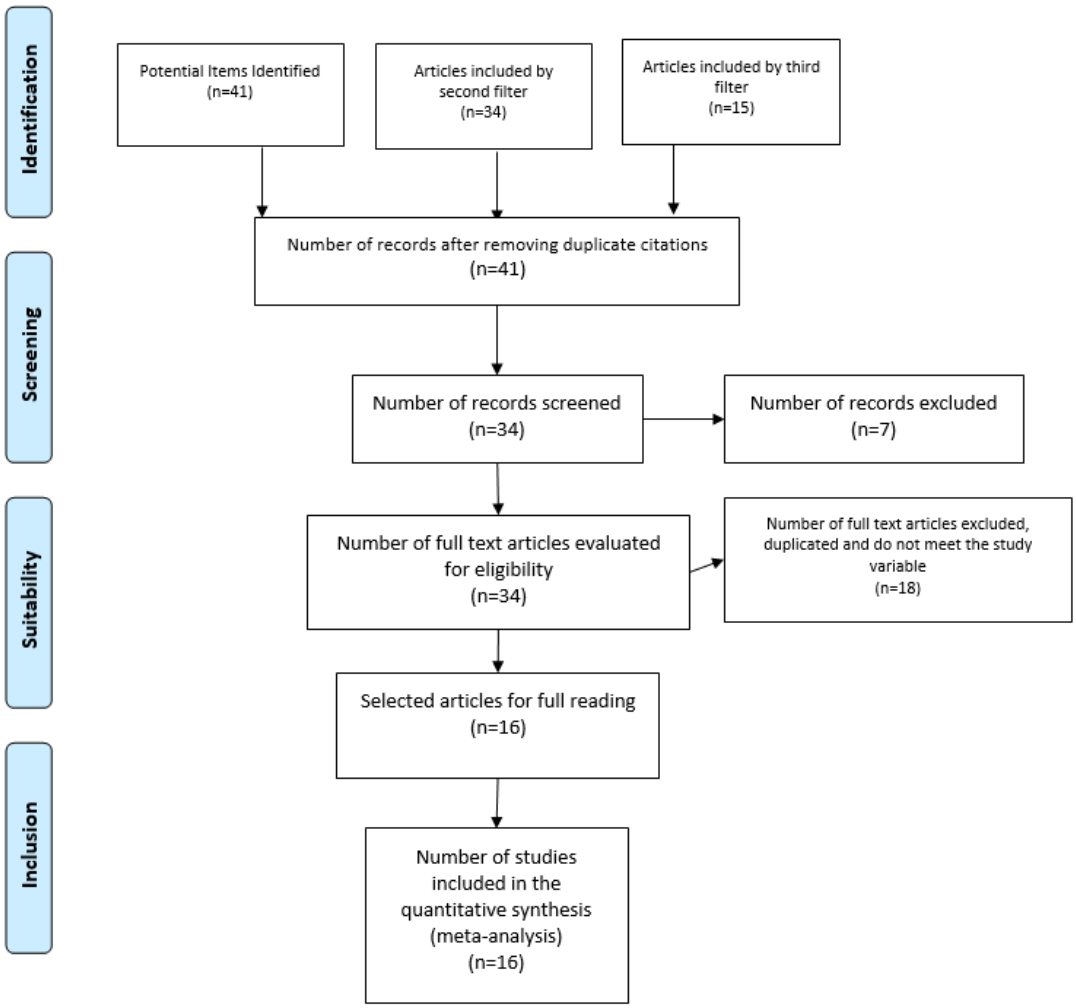


Figure 1. Flowchart of a systematic review carried out under the PRISMA technique (Moher, Liberati, Tetzlaff, Altman, & Group, 2009)

Source: Authors; Based on the proposal of the Prisma Group (Moher, Liberati, Tetzlaff, Altman, & Group, 2009)

4. Results

Table 1 presents the findings after applying the search filters associated with the methodology suggested for this study, after determining the relevance of each of the works cited.

No.	RESEARCH TITLE	AUTHOR/YEAR	COUNTRY	TYPE OF STUDY	INDEXING
1	*Artificial intelligence in forensic accounting*	Saluja, S., Nayyar, V., Dawra, S., Jain, M., Prakash, R.S. (2024)	INDIA	QUALITATIVE	SCOPUS
2	*A Study of the Impact of Internal Control Measures on ease of use of Forensic Audit Mediated by Artificial Intelligence Techniques*	Mehta, C.K. , Kaushik, V. , Bhargav, S. (2021)	INDIA	QUALITATIVE	SCOPUS
3	*Advances in the use of artificial intelligence to improve control and fraud detection in organizations; [Advances in the use of artificial intelligence to improve fraud control and detection in organizations]*	Lescano-Delgado, M. (2023).	PERU	QUALITATIVE	SCOPUS

4	*Does fintech lead to better accounting practices? Empirical evidence*	Mandella Osei-Assibey Bonsu, Ying Wang, Yongsheng Guo (2023)	UNITED KINGDOM	QUALITATIVE	WOS
5	*Machine learning- A nd evidence theory-based fraud risk assessment of China's box office*	Shi Qiu; Hong-Qu He (2021)	CHINA	QUANTITATIVE	SCOPUS
6	*Mining corporate annual reports for intelligent detection of financial statement fraud – A comparative study of machine learning methods*	Petr Hájek, Roberto Henriques (2017)	PORTUGAL, CZECH REPUBLIC	QUALITATIVE	SCOPUS
7	*The role of artificial intelligence in auditing and fraud detection in accounting information systems: moderating role of natural language processing*	Adel M. Qatawneh (2024)	JORDAN	QUALITATIVE	SCOPUS
8	*Influence of blockchain and artificial intelligence on audit quality: Evidence from*	Khowanas Saeed Qader a b, Kemal Cek a (2024).	TURKEY, IRAQ	QUANTITATIVE/QUALITATIVE	SCOPUS

	Turkey				
9	*Audit Risk Evaluation Model for Financial Statement Based on Artificial Intelligence*	Yanhua Li (2020)	CHINA	QUALITATIVE	SCOPUS
10	*Artificial Intelligence and its influence on Auditing Processes in large auditing companies in Lima 2023; [Artificial Intelligence and its influence on Audit Processes, in large auditing companies, in Lima 2023]*	Seminario Sotomayor, A., Cespedes Huaranga, S., Baltazar Huincho, M., ... Herz Ghersi, J., Flores Peraltilla, A. (2024)	PERU	QUALITATIVE	SCOPUS
11	*Artificial Intelligence for Risk Mitigation in the Financial Industry*	Mishra, A, Ananda, S ; Debnath, no; Pokhriyal, P; Patel, A (2024)	INDIA, VIETNAM	QUALITATIVE	SCOPUS
12	*Fintech in financial reporting and audit for fraud prevention and safeguarding equity investments*	Roszkowska, P (2021)	UNITED KINGDOM, POLAND	QUALITATIVE	WOS

13	*Financial Fraud Detection of Listed Companies in China: A Machine Learning Approach)*	Chen, YS and Wu, ZJ (2023)	CHINA	QUANTITATIVE	WOS
14	*Construction of Accounting Fraud and Its Audit Countermeasure Model Based on Computer Technology*	Wang, YB and Zhu, GL (2024)	MEXICO	QUANTITATIVE	WOS
15	*Comprehensive review of different artificial intelligence-based methods for credit risk assessment in data science*	Amarnadh, V and Moparthi, NR	INDIA	QUANTITATIVE	WOS

Table 1. List of articles analyzed

Source: Own elaboration

4.1 Co-occurrence of words

Figure 2 illustrates the connection between the key terms used for the identification of the study material and the creation of the systematic analysis suggested for this study.

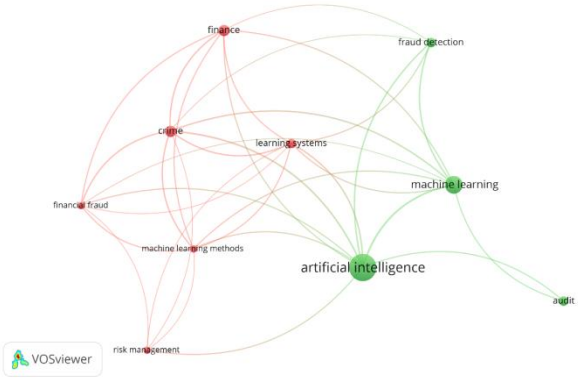


Figure 2. Co-occurrence of keywords.

Source: Own elaboration

The graph shown is a co-occurrence analysis produced through the VOSviewer program, which illustrates the connections between fundamental concepts in the literature about the incorporation of Artificial Intelligence (AI) in financial audits and fraud identification. In the diagram, the nodes symbolize pertinent ideas, while the links and their thickness indicate the frequency and intensity of the connection between these concepts. It is clear that "Artificial Intelligence" has a predominant place, which evidences its main role as an integrating theme in the analysis.

A prominent node is "Machine Learning", which is closely related to "Fraud Detection" and "Audit". This implies that machine learning, as a branch of artificial intelligence, is one of the most studied instruments to deal with particular problems in audits and identify fraud. The strong link between "Machine Learning" and "Fraud Detection" indicates that these concepts are often treated together in the literature, demonstrating their importance in the practical application of automated financial analysis systems.

On the other hand, concepts such as "Crime", "Financial Fraud" and "Risk Management" have a more indirect relationship with "Artificial Intelligence" and "Automatic Training". These principles illustrate the specific applications of technology in key sectors of economic security and regulatory compliance. The connection between "Crime" and "Financial Fraud" indicates a focus on detecting criminal activity through Artificial Intelligence, while the connection with "Risk Management" highlights the relevance of these technologies to reduce risks in financial systems.

Finally, the idea of "Teaching Systems" is linked both to "Artificial Intelligence" and to fields such as "Finance" and "Auditing". This indicates that the research is not only focused on the use of advanced technologies, but also on how they can be designed and adapted to fulfill specific functions in audits and financial controls. In summary, the graph highlights how advances in Artificial Intelligence are establishing a technological ecosystem to increase transparency, accuracy and efficiency in the management of financial fraud and audits.

4.2 Discussion

The application of artificial intelligence (AI) algorithms in financial audits has generated growing interest in the academic community, thanks to its ability to change fraud identification and optimize audit procedures. The research by Saluja, Nayyar, Dawra, Jain, and Prakash (2024) examines how AI-based techniques are transforming the role of forensic auditing in India. This analysis highlights the ability of algorithms to manage large amounts of information and identify irregular patterns that may not be perceptible to conventional auditors. The incorporation of these tools not only improves the accuracy in identifying anomalies, but also significantly decreases operational expenses, making it a feasible option for large-scale audits.

In contrast, the research by Mehta, Kaushik, and Bhargav (2021) delves into the mediating effect of Artificial Intelligence on internal control actions in forensic audits. Their findings highlight that Artificial Intelligence can enhance the accessibility and effectiveness of audits by facilitating complicated procedures, increasing confidence in the results achieved. This qualitative method offers an expanded perspective on how technology can enhance human skills, especially in the detection of economic fraud. In addition, it highlights the

importance of establishing ethical and governance frameworks to ensure responsible use of these technologies.

The influence of Artificial Intelligence is not restricted to advanced economies, as shown by the study by Lescano-Delgado (2023) in Peru, which analyzes progress in the supervision and identification of organizational fraud. This analysis highlights how developing economies are incorporating these technologies to address particular challenges in their economic environment. The ability of Artificial Intelligence to adjust to varying degrees of organizational and regulatory complexity places it as an essential instrument to enhance transparency and corporate governance.

The development of quantitative models based on machine learning for the assessment of fraud risks is also the subject of the literature. An outstanding case is the research by Qiu and He (2021), who use supervised learning methods to examine the cinema box office in China. Their findings demonstrate that algorithms are capable of detecting hidden risks through the study of variables of multiple dimensions, giving entities a competitive advantage in the proactive identification of fraud. This technical and specialized perspective emphasizes how Artificial Intelligence can be adjusted to specific sectors, extending its impact beyond the merely financial sector.

Based on this progress, Chen and Wu (2023) show a model for identifying fraud in listed companies, using sophisticated machine learning tools. This analysis, focused on the Chinese scenario, highlights how the predictive ability of algorithms surpasses conventional techniques, facilitating a more agile and accurate reaction to financial anomalies. These findings underscore the need to include cutting-edge technologies to address the growing challenges of fraud in dynamic and complex markets.

Another crucial element analyzed in the literature is the fusion of Artificial Intelligence with booming technologies, such as blockchain. Qader and Cek (2024) discuss how these two tools, when combined, can improve the quality of financial audits. Their research reveals that Artificial Intelligence and blockchain not only increase transparency and tracking of transactions, but also strengthen trust in financial systems. This multidimensional perspective is particularly significant for organizations operating in contexts with high degrees of risk.

From an organizational point of view, the research by Seminario Sotomayor, Céspedes Huaranga, Baltazar Huincho, Herz Ghersi, and Flores Peraltilla (2024) analyzes the effect of Artificial Intelligence on large-scale auditing companies in Lima. This qualitative study highlights that, although Artificial Intelligence significantly improves audit processes, its application encounters obstacles associated with resistance to change and the demand for specialized training. This discovery indicates that the successful implementation of Artificial Intelligence not only requires technological progress, but also organizational strategies that encompass change management and constant training.

In addition, research using quantitative methods, such as that carried out by Wang and Zhu (2024), shows the ability of Artificial Intelligence to develop robust models against fraud in accounting. This study, carried out in Mexico, underlines that artificial intelligence algorithms are capable of detecting atypical patterns and optimizing the effectiveness of audits through the automation of repetitive tasks. This method enables auditors to focus on strategic analysis and critical decision-making, thereby improving the overall level of professional practice.

Although the advantages of Artificial Intelligence in financial audits are clear, the literature also highlights important challenges. For example, Hajek and Henriques (2017) recognize limitations in the ability to interpret models based on machine learning. This point raises questions about how auditors can place their complete trust in the decisions produced by algorithms when they do not fully understand their operation. This lack of clarity highlights the need to develop models that are more understandable and easily accessible to end users.
Overall, the systematic analysis of these articles shows that Artificial Intelligence is transforming the financial audit landscape, with significant repercussions for fraud identification. However, the effective application of these technologies requires overcoming technical, ethical and organizational obstacles. As research progresses, it is anticipated that more integrative and adaptable approaches will emerge that will enable AI to reach its full potential in this critical sector.

5. Conclusions

The implementation of Artificial Intelligence algorithms in financial audits and fraud identification has established itself as a crucial resource in the current context, where the complexity of financial systems and the large amount of data require the adoption of sophisticated technological strategies. The systematic review of the literature shows that Artificial Intelligence not only increases the efficiency of audit procedures, but also facilitates the identification of irregular patterns that would be unfeasible when using conventional techniques. This ability to predict and analyze underscores its importance in preventing fraud and reducing economic risks, which strengthens Artificial Intelligence as an essential element in audit progress.
Advances in machine learning technology and data handling have facilitated greater accuracy in risk assessment and the identification of financial anomalies. The ability of algorithms to adjust to different situations, such as particular sectors or regional regulations, highlights their adaptability and universal usefulness. However, these developments also present ethical and technical challenges, such as ensuring clarity and understanding of the models, which is vital for approval by audit experts and entities.
The study indicates that, although research on the effect of Artificial Intelligence in financial audits is constantly growing, there are still significant inequalities in fields such as the effective incorporation of these technologies in organizational contexts. Numerous studies highlight resistance to change as a crucial obstacle to the implementation of these tools, emphasizing the importance of change management strategies and constant training for auditors. This means that, in order to maximize the advantages of Artificial Intelligence, it is essential to merge technological application with a holistic approach that takes into account human, organizational and cultural aspects.
The fusion of Artificial Intelligence with booming technologies such as blockchain is an encouraging opportunity to improve the quality and transparency of financial audits. This technological collaboration not only enhances the tracking of transactions, but also strengthens trust in financial systems. However, their effective application requires robust regulatory frameworks and closer cooperation among the actors involved, including researchers, companies and regulators, to address the challenges related to the standardization and ethical use of these technologies.
Finally, the studies reviewed underline that the future of financial audits is closely linked to the progress of artificial intelligence and its uses. As these technologies continue to progress, they may not only redefine audit procedures, but also expectations regarding the

role of the auditor, corporate governance, and risk management. Therefore, a constant effort by academia and industry is needed to investigate innovative methods that enable the revolutionary use of AI, while ensuring its responsible and ethical application in the financial sector.

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