Revue Internationale des Sciences de Gestion
ISSN: 2665-7473
Volume 9 : Numéro 2

Artificial Intelligence and the Transformation of Internal Audit in the Banking Sector

L'intelligence artificielle et la transformation de l'audit interne dans le secteur bancaire

Alami Gholami El Ghali
ENCG Settat
University Hassan 1er
Laboratory of Innovation in Finance, Governance and Artificial Intelligence

Lotfi Mohamed
ENCG Settat
University Hassan 1er
Laboratory of Innovation in Finance, Governance and Artificial Intelligence

Date submitted : 22/02//2026

Date of acceptance : 30/04/2026

To cite this article :

ALAMI GHOLAMI E. & LOTIF M. (2026) «Artificial Intelligence and the Transformation of Internal Audit in the Banking Sector», Revue Internationale des Sciences de Gestion « Volume 9 : Numéro 2 » pp : 639 - 650

Abstract:

Artificial Intelligence (AI) is transforming the banking sector, particularly internal audit functions. This study analyzes how AI enhances internal audit effectiveness and identifies associated risks. A systematic literature review based on PRISMA methodology was conducted using Scopus, Web of Science, and Google Scholar. The results show that AI improves efficiency, fraud detection, and risk management, but raises governance and ethical challenges.

Keywords : Artificial Intelligence, Internal Audit, Banking, Governance, Risk Management

Résumé:

L'intelligence artificielle transforme le secteur bancaire, notamment les fonctions d'audit interne. Cette étude analyse l'impact de l'IA sur l'efficacité de l'audit interne et identifie les risques associés. Une revue de littérature systématique basée sur la méthode PRISMA a été réalisée. Les résultats montrent une amélioration de l'efficacité mais également des défis de gouvernance.

Mots-clés : Intelligence artificielle, Audit interne, Banque, Gouvernance, Risques

Introduction

The integration of artificial intelligence in banking has significantly transformed internal audit practices. However, the academic literature remains fragmented. This paper addresses the following research question: how does AI impact internal audit performance in the banking sector? The study adopts a systematic literature review and is structured into theoretical framework, literature review, methodology, and discussion.

Theoretical Framework

This study is grounded in several complementary theoretical frameworks. First, the agency theory (Jensen & Meckling, 1976) explains the role of internal audit as a governance mechanism aimed at reducing information asymmetry and agency conflicts between managers and stakeholders. In this context, artificial intelligence enhances monitoring capabilities and strengthens control processes.

Second, the resource-based view (RBV) suggests that technological capabilities, such as artificial intelligence, constitute strategic resources that can improve organizational performance, including audit effectiveness.

Third, institutional theory highlights the pressure on banks to adopt innovative technologies such as AI to comply with regulatory requirements and maintain legitimacy.

These theoretical perspectives provide a comprehensive framework to understand how AI contributes to the transformation of internal audit in the banking sector.Artificial intelligence (AI) has emerged as one of the most influential technologies in the financial industry. AI systems are capable of processing extremely large volumes of data, identifying complex patterns, and generating predictive insights that support decision-making processes. In banking environments where millions of financial transactions occur daily, the ability to analyze data in real time has become essential for detecting irregularities and managing financial risks effectively.

Internal audit represents a fundamental component of corporate governance within banking institutions. The primary objective of internal audit is to evaluate the effectiveness of internal control systems, ensure the reliability of financial information and identify potential risks that may threaten organizational performance. Traditionally, internal audit procedures rely on manual verification, document review and sampling techniques in order to assess financial operations and compliance processes.

However, the digitalization of financial services has dramatically increased the volume and complexity of financial data. Traditional auditing approaches based on sampling methods may no longer be sufficient to analyze the entire population of transactions generated by modern banking systems. As a result, internal auditors face increasing challenges in detecting anomalies and identifying potential risks using conventional tools.

Artificial intelligence technologies offer new opportunities to transform internal auditing practices by enabling automated data analysis, anomaly detection and predictive risk assessment. AI algorithms can analyze complete datasets rather than limited samples and can detect irregular patterns that might remain undetected through traditional auditing procedures. These capabilities allow auditors to move toward more proactive and data-driven approaches to risk management.

Despite these advantages, the integration of artificial intelligence into internal auditing also raises important challenges related to algorithm transparency, governance, cybersecurity risks and the development of new technical competencies among auditors. The transformation of auditing practices therefore requires both technological investment and organizational adaptation.

The objective of this paper is to examine the role of artificial intelligence in enhancing the effectiveness of internal audit within the banking sector. Through a literature review methodology, this study analyzes existing academic and professional research in order to identify the main opportunities and challenges associated with the adoption of artificial intelligence in internal auditing

1. Literature Review

1.1 AI and Auditing

Artificial intelligence enhances audit processes through automation and advanced analytics (Appelbaum et al., 2017; Vasarhelyi et al., 2015).

However, while existing studies emphasize the efficiency gains provided by artificial intelligence, they often underestimate the limitations related to data quality and algorithmic bias.

1.2 AI and Governance

AI introduces governance challenges related to transparency, ethics, and data quality (Moffitt et al., 2018).

The findings below highlight a critical gap in the literature regarding the governance frameworks required to ensure the ethical and transparent use of artificial intelligence in auditing.

1.3 Internal Audit in Banking

Internal audit ensures compliance, risk management, and financial stability in banking institutions. The academic literature highlights the growing importance of artificial intelligence and data analytics in modern auditing practices. According to Vasarhelyi, Kogan and Tuttle (2015), the emergence of big data technologies has significantly transformed the accounting and auditing environment. The availability of massive financial datasets enables auditors to move beyond traditional sampling techniques and adopt more comprehensive analytical approaches. By analyzing entire populations of transactions, auditors can obtain deeper insights into financial operations and improve the reliability of audit procedures.

While prior research highlights the potential of AI for continuous auditing, recent studies suggest that its implementation remains uneven across banking institutions.

Overall, the literature reveals both significant opportunities and emerging challenges, suggesting the need for a more structured analytical framework.

The literature highlights the potential of AI in improving audit efficiency and risk detection. However, it remains largely descriptive and lacks integrative frameworks combining governance, audit, and technological perspectives. This gap justifies the need for a more structured conceptual approach.

1.4 AI in banking sector

The banking sector is widely recognized as one of the most technologically advanced industries. This is largely due to the sheer scale and complexity of the financial transactions banks handle daily. With millions of transactions processed every second across the globe, banks require robust and efficient systems to ensure accuracy, security, and speed. This environment is particularly conducive to the adoption of artificial intelligence (AI) technologies.

AI, and more specifically machine learning algorithms, play a pivotal role in various banking operations. For instance, around credit risk assessment, machine learning models can analyze vast amounts of customer data—such as transaction history, credit scores, and behavioral patterns—to predict the likelihood of default. This allows banks to make more informed lending decisions and manage risk more effectively.

Fraud detection is another critical application of AI in banking. By continuously monitoring transaction data in real time, machine learning algorithms can identify unusual patterns or anomalies that may suggest fraudulent activity. These systems learn from past fraud cases and adapt to new tactics, enabling faster and more accurate detection and prevention.

In addition, banks utilize AI for anti-money laundering (AML) monitoring. Machine learning models are capable of sifting through enormous datasets to spot suspicious activities that might otherwise go unnoticed using traditional rule-based systems. This enhances banks' ability to comply with regulations and protect the financial system from illicit activities.

Algorithmic trading is another domain where AI excels. Automated trading systems leverage advanced algorithms to analyze market trends, news, and trading signals at speeds far beyond human capability. This enables banks to optimize trading strategies, reduce risks, and maximize returns.

Overall, the integration of AI technologies in the banking sector enables institutions to process and analyze complex financial data structures efficiently. It also enhances their ability to detect abnormal behaviors and potential risks, thereby improving operational efficiency, security, and customer trust.

2. Conceptual Framework & methodology

A PRISMA-based systematic literature review was conducted. Databases used include Scopus, Web of Science, and Google Scholar. Keywords included 'artificial intelligence', 'internal audit', and 'banking sector'. Selection criteria focused on peer-reviewed articles published between 2015 and 2024.

The proposed conceptual model links AI capabilities (automation, anomaly detection, predictive analytics) to internal audit performance outcomes such as efficiency, effectiveness, and risk detection.

This study adopts a systematic literature review based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach to ensure transparency and rigor in the selection process.

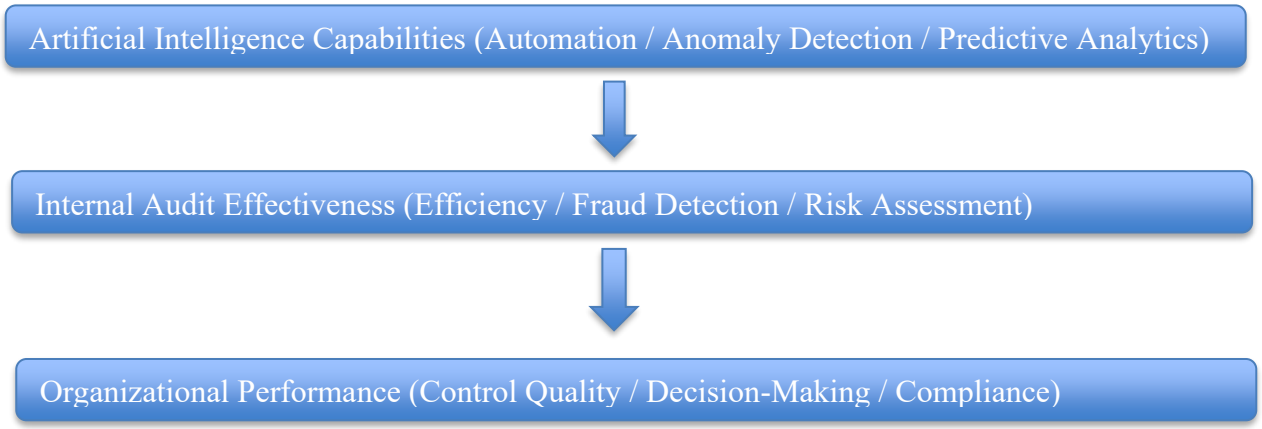
The literature search was conducted using three major academic databases: Scopus, Web of Science, and Google Scholar. The following keywords were used: “Artificial Intelligence”, “Internal Audit”, “Audit Analytics”, and “Banking Sector”.

The initial search resulted in approximately 120 articles. After removing duplicates and screening titles and abstracts, 65 articles were retained. A full-text analysis was then conducted, leading to the exclusion of studies that were not directly linked with internal audit or the banking sector.

Finally, a total of 35 relevant peer-reviewed articles published between 2015 and 2024 were selected for the analysis.

The selection criteria included relevance to the research topic, academic quality, and focus on artificial intelligence applications in auditing or financial institutions. Non-academic sources, conference summaries without full papers, and articles not written in English or French were excluded.

Based on the analysis of existing research, artificial intelligence can enhance internal audit performance through several mechanisms. First, automation technologies allow repetitive audit procedures to be executed automatically. Tasks such as transaction testing, data reconciliation and document verification can be performed using AI-based systems, reducing manual workload and improving operational efficiency. Second, anomaly detection algorithms enable auditors to identify unusual patterns in financial datasets. Machine learning models can analyze historical transaction data and detect deviations from normal patterns that may indicate fraud or operational irregularities. Peer-reviewed journals in accounting and auditing were prioritized to ensure the academic credibility of the selected sources.



The conceptual model is based on three main constructs:

- The independent variable is Artificial Intelligence capabilities, which include automation, anomaly detection, and predictive analytics.
- The dependent variable is Internal Audit Effectiveness, measured through audit efficiency, fraud detection capabilities, and risk assessment quality.
- Additionally, Organizational Performance is considered as an outcome variable, reflecting improvements in decision-making, internal control quality, and regulatory compliance.

Three hypotheses can be proposed:

- H1: Artificial intelligence capabilities positively influence internal audit effectiveness.
- H2: Internal audit effectiveness positively impacts organizational performance.
- H3: Artificial intelligence has an indirect positive effect on organizational performance through internal audit effectiveness.

3. Discussion

The findings confirm that AI improves audit efficiency and enhances risk detection. However, challenges related to governance, data quality, and auditor skills remain significant.

The integration of artificial intelligence into internal auditing represents a major transformation in the auditing profession. AI technologies allow auditors to analyze significantly larger datasets than previously possible and improve the detection of anomalies in financial transactions. Continuous auditing systems supported by AI enable financial institutions to monitor transactions in real time

and detect irregular activities immediately. This capability significantly strengthens internal control systems and improves risk management processes.

While artificial intelligence offers significant opportunities for enhancing internal audit, several limitations must be considered. First, the opacity of AI algorithms raises concerns regarding transparency and auditability. Second, the implementation of AI requires significant investment and technical expertise, which may limit its adoption in certain banking institutions.

Furthermore, the reliance on data-driven systems may introduce new risks related to data quality, cybersecurity, and algorithmic bias. These challenges highlight that AI should not replace auditors but rather complement their professional judgment.

4. Managerial Implications

The findings of this study offer several important implications for banking institutions aiming to integrate artificial intelligence into their internal audit functions. Firstly, it is crucial for banks to invest in advanced analytics infrastructure that can support AI-driven audit processes. By adopting modern analytics platforms, banks enable their auditors to efficiently process and analyze large volumes of financial data. This not only streamlines the audit process but also enhances the ability to monitor risks in real time, making it easier to detect irregularities or emerging threats.

Secondly, the successful implementation of AI in internal audits requires auditors to possess a new set of technical skills. To address this need, banks should introduce comprehensive professional training programs focused on artificial intelligence technologies. These programs would equip auditors with the knowledge necessary to understand, operate, and interpret AI-driven tools and models. As a result, auditors can better leverage the capabilities of AI to gain deeper insights, make more informed decisions, and improve the overall effectiveness of the audit function.

In summary, integrating AI into internal audit processes demands both technological investment and a commitment to continuous professional development. By focusing on these areas, banks can maximize the benefits of artificial intelligence, strengthen their risk management frameworks, and enhance the quality and reliability of their audit outcomes.

Conclusion

This study contributes to the literature by proposing a structured model of AI integration in internal audit. Future research should focus on empirical validation through case studies or surveys in banking institutions.

Artificial intelligence is rapidly transforming the financial services industry and reshaping internal audit practices within banking institutions. AI technologies provide significant opportunities to improve audit efficiency, strengthen fraud detection mechanisms and enhance risk management processes.

Nevertheless, the integration of artificial intelligence into internal auditing also introduces new challenges related to governance, transparency and data security. Banks must develop appropriate regulatory frameworks and training programs in order to ensure responsible and effective use of AI technologies in auditing practices.

Future research could explore empirical case studies examining the implementation of artificial intelligence systems in banking institutions and evaluate their impact on audit quality and financial performance.

REFERENCES

Amer, M., Hilmi, Y., & El Kezazy, H. (2024, April). Big Data and Artificial Intelligence at the Heart of Management Control: Towards an Era of Renewed Strategic Steering. In The International Workshop on Big Data and Business Intelligence (pp. 303-316). Cham: Springer Nature Switzerland.

Appelbaum, D. et al. (2017). Big Data and analytics in auditing.

Deloitte (2020). AI and the Future of Internal Audit.

Dounia, G. A. G. A., KAIZAR, C., AGOUDAL, A., BENARBI, H., & HILMI, Y. (2025). Transformation digitale et mutation du métier de contrôleur de gestion: revue de littérature et perspectives. Revue Française d'Economie et de Gestion, 6(3).

ESSAHLI, F. E., & HILMI, Y. (2026). Digitalisation et transformation du contrôle de gestion: vers un rôle de business partner. Agence Francophone, 689-706.

KAIZAR, C., Dounia, G. A. G. A., & HILMI, Y. (2026). Intelligence artificielle et contrôle de gestion: leviers d'accountability et de gouvernance efficace. Agence Francophone, 576-607.

HILMI, Y., & FATINE, F. E. (2022). The Contribution of internal audit to the corporate performance: a proposal of measurement indicators. International Journal of Performance and Organizations, 1(1), 45-50.

HILMI, y., & NAJI, F. (2016). Audit social et performance de l'entreprise : une étude empirique au sein du champ organisationnel marocain. Revue des Etudes Multidisciplinaires en Sciences Economiques et Sociales, 1(3). doi:https://doi.org/10.48375/IMIST.PRSM/remses-v1i3.5271

Hilmi, Y., & Fatine, F. E. (2022). Transformation digitale des cabinets d'audit par les réseaux sociaux: Cas de KPMG. International Journal of Economics and Management Sciences, 1(1).

HILMI, Y. L'ÉTHIQUE DE L'ENTREPRISE: UN BON MOYEN DE PROTECTION CONTRE LA FRAUDE THE ETHICS OF BUSINESS: A GOOD WAY TO PROTECT AGAINST FRAUD.

HILMI, Y. (2013). L'audit interne au Maroc: Degré d'intégration et spécificités de l'entreprise. Revue marocaine de recherche en management et marketing, (8).

HILMI, Y. (2013). L'audit interne au Maroc: Degré d'intégration et spécificités de l'entreprise. Revue marocaine de recherche en management et marketing, (8).

Hilmi, Y. (2014). Degré d'intégration de l'audit interne et performance des entreprises marocaines/cas de la région de rabat-sale-Zemmour-Zaïr.

KPMG (2021). Artificial Intelligence in Financial Services: Opportunities and Challenges.

PwC (2022). Digital Transformation in Banking.

Moffitt, K. et al. (2018). Robotic process automation in auditing.

Vasarhelyi, M. et al. (2015). Big Data in auditing.