

## Adoption of Automated Audit Tools and Their Effect on Audit Quality in Information Systems

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### ABSTRACT

The increasing digitalization of organizations has elevated the importance of automated audit tools in strengthening audit quality within information systems environments. Despite their growing relevance, research on how these tools influence audit outcomes remains fragmented. This study aims to systematically review empirical evidence on the adoption of automated audit tools and their effect on audit quality. Using PRISMA guidelines, 36 eligible studies, published between 2015 and 2025 were analyzed across major scientific databases. The review found that automated tools such as Computer-Assisted Audit Techniques (CAATs), data analytics, Artificial Intelligence (AI), blockchain, and Robotic Process Automation (RPA) significantly enhance audit accuracy, fraud detection, efficiency, and internal control reliability. However, adoption is shaped by organizational support, auditor IT competence, perceived usefulness, and technological readiness, while challenges include skill gaps, high costs, system risks, and limited regulatory guidance. The study concludes that automated audit tools are essential for improving audit quality and calls for greater investment in digital capabilities to support their effective implementation.

**KEYWORDS:** Automated Audit Tools; Audit Quality; Auditors; Information Systems

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### 1.0 INTRODUCTION

The rapid digital transformation of organizations has significantly influenced the field of auditing, particularly within information systems environments. As businesses increasingly rely on complex digital infrastructures, auditors' roles have expanded to include evaluating automated processes, digital controls, and computerized records. In response, automated audit tools such as Computer-Assisted Audit Techniques (CAATs), data analytics platforms, and AI-enabled audit systems have emerged as essential instruments for improving the efficiency and effectiveness of audit procedures (Noaman et al., 2025; Naidoo, 2021). These tools support auditors in processing large volumes of data, identifying anomalies, strengthening internal controls, and enhancing the reliability of information system audits (Bukhari et al., 2021).

Audit quality has become a central concern for organizations, regulators, and stakeholders. High-quality audits promote transparency, strengthen governance, reduce information asymmetry, and improve trust in financial and system-related reports (Al-Mawali & Obeid, n.d.). With the growing complexity of digital environments, manual audit methods alone are no longer sufficient for ensuring audit quality. Automated audit tools have the potential to increase accuracy, reduce human error, and enhance auditors' ability to detect irregularities in information systems (Nguyen, 2025; Celestin & Vanitha, 2019; Ikponmwoba et al., 2020). However, despite their potential benefits, adoption levels and the actual impact of these tools on audit quality remain inconsistent across organizations and contexts.

A review of existing literature reveals that although many studies highlight the usefulness of automated audit tools, there is limited consolidated evidence on their overall effectiveness in improving audit quality. Research findings vary widely, with some emphasizing significant improvements in audit performance (Ghafari et al., 2024; Eulerich et al., 2023), while others note challenges such as resistance to technological change, lack of technical skills, cost implications, and inadequate organizational support (Stensjo,

2020; Van Staden, 2024). Furthermore, although several empirical studies exist, there is a lack of a comprehensive systematic synthesis that integrates current knowledge to determine the extent to which automated audit tools influence audit quality in information systems settings. This gap highlights the need for a systematic literature review to bring clarity, identify trends, and map the evidence base surrounding the adoption and impact of automated audit tools.

### 1.1 Research Objectives

1. To identify and examine the key determinants that influence the adoption of automated audit tools.
2. To evaluate the impact of automated audit tools on audit performance, accuracy, and overall audit quality.
3. To explore the challenges and barriers that hinder the adoption and effective use of automated audit tools among audit practitioners.
4. To assess emerging technological trends and analyze their potential influence on the future of audit quality.

### 1.2 Research Questions

1. What key factors influence organizations' adoption of automated audit tools?
2. How do automated audit tools affect the accuracy, reliability, and overall quality of audit outcomes?
3. What major challenges and barriers limit the effective adoption and use of automated audit tools in audit firms?
4. How are emerging technological trends expected to shape the future of automated auditing and improve audit quality.

## 2.0 LITERATURE REVIEW

Empirical studies consistently demonstrate that the integration of automated audit tools such as Computer-Assisted Audit Techniques (CAATs), data analytics, robotic process automation, and AI-driven audit systems has transformed the audit environment and enhanced audit quality in information system contexts. Crucean et al., (2023) found that information technology adoption significantly improves audit quality among European listed companies by increasing accuracy, efficiency, and the reliability of audit outcomes. Similarly, Alotaibi et al., (2023) revealed that auditors perceive audit software as a critical driver of audit quality because it strengthens internal controls and enhances the detection of irregularities. These findings align with Owino et al., (2021) conclusion that the use of CAATs leads to improved audit quality factors, such as fraud detection effectiveness and audit report reliability in developing countries

Several studies have examined the determinants of automated audit tool adoption and their implications for audit performance. Ghani et al., (2024) reported that internal auditors' use of generalized audit software improves audit efficiency but is influenced by organizational support, training, and auditors' technological readiness. Pedrosa, Costa, and Aparicio (2020) also identified technological competence, perceived ease of use, and organizational commitment as key drivers of CAATs adoption. These determinants are further affirmed by AIOkaily et al. (2024), who found that post-COVID-19 adoption of automated audit tools is shaped by perceived usefulness, IT competency, and evolving organizational digital needs. Likewise, Amadu et al. (2025) highlighted that organizational culture plays a moderating role in the adoption of CAATs, emphasizing that supportive cultures significantly enhance adoption outcomes among internal audit units.

Empirical evidence also shows that automated audit tools directly influence audit effectiveness in information system environments. Qatawneh, (2021) demonstrated that automated AIS applications enhance internal audit quality by improving data accuracy and reducing audit risks. Almasria et al. (2021) similarly argued that accounting information systems contribute to improved external audit procedures by strengthening system reliability and enhancing auditors' ability to analyze digital records. In addition, studies by Noordin, Hussainey, and Hayek (2022) highlight the role of artificial intelligence in improving audit decision-making quality, particularly by increasing efficiency and reducing human error in complex IT environments.

Other empirical studies focus specifically on the quality dimensions of IT audits. Stoel and Havelka (2021) established that IT audit quality is influenced by individual auditor competencies, organizational infrastructure, and the availability of digital audit tools. Zhang,

(2019) and Huang and Vasarhelyi (2019) further demonstrate that intelligent automation and robotic process automation significantly enhance audit quality by improving accuracy, eliminating repetitive errors, and strengthening the overall assurance process in digital systems. These findings provide strong evidence that automation not only enhances productivity but also strengthens audit reliability in information system settings.

Empirical studies from developing countries reinforce similar results. Omonuk and Oni (2015) showed that CAATs significantly improve audit quality in Nigerian audit firms, especially through improved fraud detection and better analytical processes. Al-Hiyari, Al Said, and Hattab (2019) found that the use of CAATs among Jordanian internal auditors is strongly influenced by management support, auditor skills, and perceived ease of use. Furthermore, Almaqtari, (2025) emphasized that IT audit adoption in Saudi Arabia is shaped by technological readiness and the perceived value of automated audit tools in improving audit effectiveness.

In terms of emerging technologies, several studies examine the integration of artificial intelligence and blockchain into audit processes. Seethamraju and Hecimovic (2023) highlighted that AI adoption in auditing enhances audit speed, anomaly detection,

and audit judgment quality. Cazazian, (2022) found that blockchain integration into audit systems enhances transparency and audit quality by improving the traceability and reliability of digital financial records.

Overall, the empirical evidence strongly supports that automated audit tools significantly enhance audit quality in information systems by improving efficiency, accuracy, fraud detection capabilities, and system reliability. However, adoption levels vary depending on organizational culture, technological competence, management support, and auditors' readiness to embrace digital transformation. This demonstrates a consistent empirical link between automation adoption and audit quality while also revealing gaps related to adoption challenges, skill gaps, and contextual differences across regions.

### 2.1 Theoretical Framework

The theoretical framework for this study is grounded in the Theory of Planned Behaviour (TPB), which explains how auditors' intentions and behaviors influence the adoption of automated audit tools. According to TPB, the adoption of technologies such as CAATs, data analytics, AI-driven tools, and automated AIS systems is shaped by three core determinants: attitude, subjective norms, and perceived behavioural control. Attitude reflects auditors' positive beliefs about the usefulness, efficiency, and audit-quality benefits of automated tools, as supported by evidence showing that tools enhance accuracy, fraud detection, and reliability (Crucean & Hategan, 2023; Alotaibi & Alnesafi, 2023). Subjective norms represent the influence of organizational expectations, top management support, and professional pressures encouraging adoption, as demonstrated by studies highlighting the role of culture and leadership in motivating auditors to embrace automated tools (Amadu et al., 2025; Al Omari et al., 2025). Perceived behavioural control involves auditors' confidence in their ability to use these technologies, shaped by IT competency, system quality, training, and digital infrastructure, which strongly predict adoption outcomes (Stoel & Havelka, 2021; Al-Hiyari et al., 2019). Together, these three TPB components form behavioural intention, which drives the actual adoption of automated audit tools, leading to improved audit quality through enhanced efficiency, accuracy, and system reliability (Owino & Musuva, 2021; Qatawneh, 2021; Zhang, 2019). Thus, TPB provides a robust theoretical explanation of how psychological, organizational, and technological factors jointly influence auditors' adoption behaviors and resulting improvements in audit quality.

## 3.0 METHODOLOGY

### 3.1 Research Design

This study adopts a Systematic Literature Review (SLR) guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. The PRISMA method ensures a transparent, replicable, and rigorous process of identifying, screening, and synthesizing empirical evidence on the adoption of automated audit tools and their effect on audit quality in information systems. This approach is appropriate for consolidating fragmented findings across different contexts, identifying research trends, addressing gaps, and providing an evidence-based understanding of the relationship between automated audit tools and audit quality.

### 3.2 Search Strategy

A comprehensive search strategy was developed to identify relevant empirical studies published in peer-reviewed journals, conferences, and academic repositories. The search combined keywords and Boolean operators to improve precision and coverage. The main search terms used included:

- “automated audit tools”
- “computer-assisted audit techniques” OR “CAATs”
- “audit software” OR “IT audit tools”
- “audit automation” OR “digital audit technologies”
- “audit quality” AND “information systems”
- “AI in auditing” OR “robotic process automation in auditing”
- “technology adoption” AND “audit”

Boolean combinations included:

- (“automated audit tools” OR “CAATs”) AND “audit quality”
- (“audit software” OR “IT audit tools”) AND “information systems”
- (“AI auditing” OR “RPA auditing”) AND “audit effectiveness”
- (“technology adoption” AND “audit tools”)

### 3.3 Databases and Sources of Literature

The following academic databases and digital repositories were searched: Scopus, Web of Science, ScienceDirect, Emerald Insight, Google Scholar, ResearchGate, Taylor & Francis, and SpringerLink.

Reference lists of included papers were also manually screened to identify additional eligible studies (snowballing technique).

### 3.4 Inclusion and Exclusion Criteria

To ensure relevancy and rigor, the following criteria were applied:

#### *Inclusion Criteria*

1. Empirical studies (quantitative, qualitative, mixed-methods).
2. Studies examining automated audit tools, CAATs, AI-based auditing, digital audit systems, or automated AIS.
3. Studies evaluating the effect of audit technologies on audit quality, audit effectiveness, or audit performance.
4. Peer-reviewed articles, theses, conference papers, and scholarly publications.
5. Studies published between 2015 and 2025 (reflecting modern audit technologies).
6. Studies written in English.

#### *Exclusion Criteria*

1. Conceptual papers without empirical evidence.
2. Studies not related to audit tools or audit quality.
3. Papers focusing solely on traditional auditing without digital tools.
4. Duplicates, editorials, blogs, or non-academic materials.
5. Studies lacking accessible full-text versions.

### 3.5 Quality Assessment

To ensure methodological rigor, included studies were evaluated using a standardized checklist adapted from:

- Joanna Briggs Institute (JBI) checklist for cross-sectional and qualitative studies (Barker et al., n.d.)

Quality assessment criteria included:

- Clarity of research aims
- Appropriateness of methodology
- Sampling and data collection methods
- Validity and reliability
- Data analysis rigor
- Strength of findings
- Relevance to audit tool adoption and audit quality

Studies were rated as high, moderate, or low quality. Low-quality studies were excluded from the final synthesis.

### 3.6 Data Extraction and Synthesis

A structured data extraction table was designed to capture key elements from each study, including: Author and year, Study purpose, Research design, Type of automated audit tool, and Major findings.

A thematic synthesis approach was used to categorize findings into major themes such as:

- Determinants of audit tool adoption
- Impact of automated tools on audit quality
- Auditor competence and organizational support
- Emerging technologies (AI, blockchain, RPA)
- Challenges and risks in automation adoption

**Table 1: Data Extraction Table**

Author	Study Purpose	Methodology	Automated Audit Tool Investigated	Key Findings
Crucean & Hategan (2023)	Assess impact of IT on audit quality	Quantitative	General IT audit technologies/IT investment	IT adoption associated with improved audit quality in listed firms.
Jebreel et al. (2025)	Examine user-related antecedents & perceived audit quality outcomes of CAATs use	Empirical; survey-based	CAATs / Computer-assisted audit tools & techniques	User-related factors significantly shape perceived audit quality from CAATs
Adorm-Takyi (2023)	Explore factors influencing audit quality of audit firms	Mixed methods (Interviews + surveys)	Audit automation tools / CAATs	Audit automation adoption, supported by culture and training, improves audit quality in Ghana.

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Mahzan & Lymer (2014)	Examine adoption of CAATs by internal auditors	Qualitative: case studies	Generalized audit software (GAS/CAATs)	Adoption improves efficiency; success depends on training and support
Cazazian (2022)	Blockchain adoption in AI-based digital financial services, AIS, and audit quality control	Conceptual / review	Blockchain & AI integration in AIS	Blockchain enhances traceability and may strengthen audit quality control.
Qatawneh (2021)	Assess risks of adopting automated AIS on internal audit quality	Quantitative / conceptual	Automated AIS applications	Automated AIS can improve internal audit quality but introduces risks that must be mitigated.
Almasria et al. (2021)	Role of AIS in enhancing external audit procedures	Empirical / survey or case study	Accounting Information Systems (AIS)	AIS strengthens external audit by improving evidence reliability and analysis
Owino & Musuva (2021)	Explores empirical assessment of improved audit quality using CAATTs	Survey	CAATTs / Computer-assisted audit tools	CAATTs positively associated with improved audit quality in the Kenyan context.
Stoel & Havelka (2021)	Investigate impact of individual & organizational factors on IT audit quality	Quantitative (Survey)	IT audit tools & practices	Individual competencies and organizational readiness crucial for IT audit quality.
Al-Okaily et al. (2024)	Examine critical factors of CAATTs adoption post-COVID	Survey	CAATs / Computer-assisted audit tools	Pandemic accelerated CAATs adoption; IT competency key determinant
Alotaibi & Alnesafi (2023)	Assess impact of audit software on audit quality: auditors' perceptions	Survey	Audit software / analytics tools	Auditors perceive audit software as enhancing audit quality
Al-Ateeq et al. (2022)	Big data analytics in auditing and consequences for audit quality using TAM	Empirical survey (TAM-based)	Big data analytics tools	TAM explains auditors' acceptance of big data tools which improve audit outcomes.

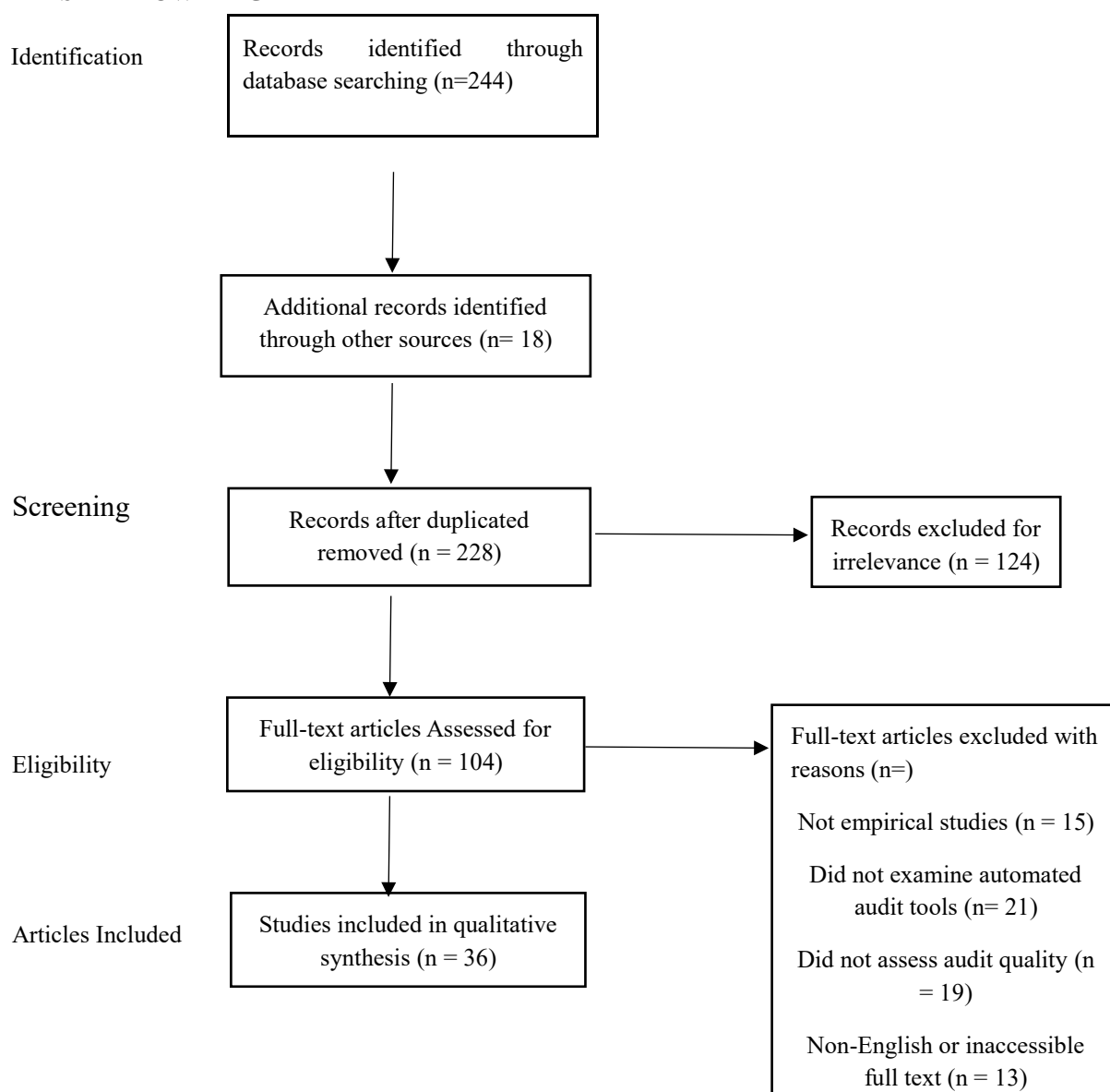
Pedrosa, Costa & Aparicio (2020)	Explores Determinants of CAATs adoption	Survey/Empirical	CAATs	TAM-like variables strongly predict CAATs adoption.
Almaqtari (2025)	Determinants of IT audit usage with focus on CAATs	Empirical	Computer audit assisted tools	Saudi context: readiness and perceived benefits drive usage.
Andrade et al. (2023)	Assesses adoption of technological tools in continuous audit projects	Case studies / empirical	Continuous audit technologies / CAATs	Technological adoption enables continuous auditing and enhances quality
Allami et al. (2024)	Examine factors associated with intention to use IT in audit	Survey	IT audit tools	Identifies behavioral determinants of auditors' intention to adopt IT.
Omonuk & Oni (2015)	Explores CAATs and audit quality in developing countries	Survey	CAATs	CAATs positively impact audit quality despite resource limits.

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Seethamraju & Hecimovic (2023)	Adoption of AI in auditing: exploratory study	Exploratory empirical (mixed methods / interviews & survey)	AI in auditing	AI adoption enhances analytical processing and audit quality.
Amadu et al. (2025)	Determinants of CAATs adoption among internal audit units; moderating role of culture	Empirical (Survey)	CAATs	Organizational culture moderates adoption; positive culture enhances outcomes.
Al Omari et al. (2025)	Impact of top management support on CAATs adoption; mediating effects of auditor IT competency & innovativeness	Empirical (survey + mediation analysis)	CAATs / Audit software	Top management support is pivotal for CAATs adoption and perceived benefits.
ALQURAISHI et al. (2025)	Explores IT adoption model in auditing profession with sustainable dev. approach	Conceptual + empirical model	IT tools in Auditing	Proposes integrated IT adoption model linking sustainability & audit practice.
Al-Hiyari, Al Said & Hattab (2019)	Examines factors influencing CAATs use by internal auditors	Survey	CAATs	Management & skills strongly influence CAATs use among internal auditors
Kudrenko & Demianchuk (2019)	Examines Information systems and technologies in the audit	Conceptual / descriptive	IS & audit technologies	Reviews the role of information systems in auditing contexts
Yeghaneh, Zangiabadi & Firozabadi (2015)	Factors affecting IT audit quality	Empirical(survey/conceptual)	IT audit practice	Identifies key factors that determine IT audit quality.
Katamba et al. (2017)	Explores Impact of IS on financial audit and auditors' preparedness	Empirical Survey	Client,automated environment (IS)	External auditors may be underprepared for clients' automated environments.
Alagić, Turulja & Bajgorić (2021)	Identification of IS audit quality factors	Conceptual/empirical	IS audit factors/tools	Presents dimensions of IS audit quality and associated determinants.
Ahmad et al. (2023)	Effect of system quality & user quality of IT on internal audit effectiveness; moderating effect of management support	Quantitative	System quality aspects of AIS	System & user quality drive internal audit effectiveness; management support moderates.
Al-Hattami et al. (2021)	Effect of risk of using computerized AIS on external auditor's work quality	Empirical	Computerized AIS	Computerized AIS improves processes but risks can affect external audit quality.
Alayli (2023)	Explores Impact of AIS on audit quality: Lebanese SMEs	Empirical (survey / case)	Accounting Information Systems	AIS adoption in SMEs improves audit outcomes when properly implemented.
Lowe et al. (2018)	Examines information technology in audit context: have Big 4 lost advantage?	Empirical (comparative quantitative)	IT use among audit firms	IT levels the playing field; firm-specific factors still matter for audit quality
Noordin,Hussainey & Hayek (2022)	Use of AI and audit quality: external auditors' perspectives	Survey	AI audit tools	External auditors report AI improves audit quality aspects but needs governance.
Huang & Vasarhelyi (2019)	Applying RPA in auditing: a framework	Conceptual + case examples	Robotic Process Automation (RPA)	RPA framework shows RPA can enhance audit efficiency and reliability.

Zhang (2019)	Explores intelligent process automation in audit	Conceptual empirical cases +	Intelligent Process Automation / IPA	Intelligent automation reduces human error and improves audit processes.
Ikponmwoba et al., (2020)	Explores Intelligent audit controls for improving the accuracy and efficiency of bank reconciliation.	Systematic Literature Review	Machine Learning Algorithms, RPA, and NLP	Found that organizations can significantly enhance the accuracy, efficiency, and reliability of their financial records by integrating AI and ML into the reconciliation process.
Ghafar et al., (2024)	Explores the role of AI in enhancing the efficiency and effectiveness of global internal audit functions.	Examines case studies and industry practices	ML, NLP, Predictive analytics	AI is a necessary evolution for achieving optimal audit outcomes.
Seethamraju and Hecimovic (2023)	Examines the adoption of artificial intelligence in auditing	Exploratory, Semi-structured interviews	Artificial Intelligence	Technological, organizational, and environmental factors influence the adoption of AI tools in audit practice

## PRISMA FLOW DIAGRAM



### 4.0 FINDINGS

The findings of this systematic literature review are presented in four dominant thematic areas that emerged across the 36 included studies: (1) determinants of adopting automated audit tools, (2) effects of automated audit tools on audit quality, (3) challenges and barriers to adoption, and (4) emerging technological trends influencing audit practice. These themes reflect consistent patterns across the reviewed empirical studies and provide insights into how automated audit tools shape audit quality within information systems environments.

#### 4.1 *Determinants of Automated Audit Tool Adoption*

Across the reviewed studies, adoption of automated audit tools such as CAATs, generalized audit software, AI-driven audit systems, blockchain-embedded audit processes, big data analytics tools, and robotic process automation was found to be strongly influenced by several organizational, technological, and individual-level factors.

Multiple studies (e.g., Amadu et al., Al Omari et al., Mahzan & Lymer) show that top management support, organizational commitment, and a technology-friendly culture are among the strongest predictors of tool adoption. Firms with leadership that prioritizes innovation, provides training resources, and demonstrates openness to digital transformation exhibited significantly higher adoption rates.

Auditor technical skills and IT competency consistently emerged as key enablers of adoption. Studies from Africa, the Middle East, Europe, and Asia emphasize that auditors with higher levels of digital literacy, familiarity with IT audit procedures, and competence in AIS/CAATs are more likely to use automated tools effectively.

Guided largely by the Technology Acceptance Model (TAM), several studies (e.g., Pedrosa et al., Al-Ateeq et al., Al-Okaily et al.) confirmed that perceptions of usefulness, the belief that automated tools enhance audit performance significantly influence adoption. Likewise, perceived ease of use, interface simplicity, and user-friendly design encourage adoption.

Technological readiness, including the availability of robust IT infrastructure, reliable information systems, cybersecurity safeguards, and well-established governance structures, also supports adoption across firms. Additionally, external pressures such as regulatory demands, competitive markets, industry-wide digital transformation, and technologically advanced audit clients influence auditors' inclination to adopt digital tools. Overall, the literature shows that adoption is a multidimensional process shaped by organizational support, auditor skills, technological readiness, usability perceptions, and the broader industry environment.

#### 4.2 *Impact of Automated Audit Tools on Audit Quality*

A major theme across the 36 studies is the strong positive association between automated audit tools and overall audit quality. Studies consistently show that automated tools provide more accurate, reliable, and comprehensive audit evidence. Technologies such as CAATs, audit analytics, and RPA reduce human error, enhance precision, and offer higher-quality insights from large datasets.

Empirical evidence from developing and developed contexts demonstrates that automated tools significantly enhance fraud detection and risk profiling. Studies from Kenya, Nigeria, Jordan, and Europe indicate that auditors using CAATs perform deeper analyses and identify anomalies that manual techniques often miss.

Moreover, automated audit tools increase efficiency by reducing audit cycle times, streamlining workflow processes, and facilitating continuous auditing through real-time monitoring and intelligent automation. They also strengthen internal control assessments, as systems like AIS, blockchain-based audit modules, and automated control mechanisms enhance transparency, traceability, and audit trail integrity. Stronger Internal Controls and Assurance Quality AIS and automated control systems improve internal control testing and strengthen audit trails. Tools such as blockchain and embedded audit modules enhance transparency, traceability, and system reliability.

In addition, AI-driven auditing and algorithmic decision-support tools promote greater consistency and standardization by reducing subjective judgment errors and ensuring uniform application of audit procedures. Overall, the evidence demonstrates that automated audit tools substantially improve audit accuracy, enhance fraud detection capabilities, boost efficiency, and reinforce internal controls, thereby contributing to higher overall audit quality.

#### 4.3 *Challenges and Barriers Affecting Adoption*

Despite the clear benefits of automated audit tools, the literature reveals several challenges that continue to hinder their widespread adoption. A major barrier is the lack of IT-related skills among auditors, which often leads to resistance toward using new technologies; studies from Africa, the Middle East, and parts of Europe consistently highlight limited digital competencies as a significant constraint.

Financial limitations further impede adoption, as the high costs associated with acquiring, upgrading, and maintaining automated audit tools pose difficulties for many firms, particularly small and medium-sized practices. In addition, automated AIS introduces system risks, such as data breaches, system failures, and data-integrity issues, all of which can adversely affect audit quality when appropriate controls are not in place.



Adoption is also restricted by weak technological infrastructure, including poor internet connectivity, inadequate hardware, and outdated systems, especially in regions where digital readiness remains low. Moreover, the absence of clear regulatory guidelines for emerging technologies such as AI-based auditing, big data analytics, and blockchain-enabled audit processes creates uncertainty and slows adoption, particularly in developing countries.

Overall, these findings indicate that skill gaps, financial constraints, system risks, infrastructure limitations, and inadequate regulatory frameworks continue to hinder the effective adoption of automated audit tools.

### ***4.4 Emerging Technological Trends Shaping Future Audit Quality***

The reviewed studies further reveal that emerging technologies are playing a transformative role in reshaping audit practice and defining future expectations of audit quality. Several authors highlight the growing influence of artificial intelligence and machine learning in auditing, noting that these tools enhance predictive analysis, strengthen anomaly detection, and provide automated judgment support, thereby improving the depth and reliability of audit insights (Noordin et al., 2022; Seethamraju & Hecimovic, 2023).

The literature also emphasizes the critical role of big data and advanced analytics in enabling auditors to examine full data populations rather than samples, resulting in more robust risk assessments, improved real-time monitoring, and enhanced pattern recognition (Al-Ateeq et al., 2022). Additionally, blockchain-based audit systems are recognized for offering tamperproof and transparent audit trails, while smart contracts automate internal control testing and reinforce assurance processes (Cazazian, 2022). Robotic process automation is also highlighted as a key innovation that automates repetitive audit tasks, supports continuous auditing, and strengthens efficiency and reliability across audit procedures (Huang & Vasarhelyi, 2019; Zhang, 2019). Taken together, these technological advancements illustrate a clear trend within the literature: emerging automation technologies are expanding the scope, depth, and precision of audit activities, ultimately enhancing audit quality through real-time assurance, comprehensive data coverage, and more intelligent decision-support mechanisms.

## **5.0 DISCUSSION**

This chapter discusses the findings of the systematic literature review by interpreting how they relate to existing theories and prior studies, explaining their significance, and highlighting their implications for audit practice. The discussion is organized around the major themes that emerged: determinants of automated audit tool adoption, effects on audit quality, challenges affecting adoption, and the role of emerging technologies in shaping future audit performance.

### ***5.1 Adoption of Automated Audit Tools: A Multidimensional Process***

The review demonstrates that the adoption of automated audit tools is shaped by a combination of organizational, technological, and individual-level factors. This aligns strongly with the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB), both of which emphasize perceptions of usefulness, ease of use, and behavioral intention as core determinants of technology adoption.

The literature consistently highlights that organizational support, particularly from top management, plays a pivotal role in facilitating adoption. This is consistent with TPB's emphasis on subjective norms, where leadership expectations influence auditors' behavior. Studies across different regions further show that organizations that invest in training and cultivate a technology-friendly culture experience higher adoption rates. This reinforces TAM's argument that perceived usefulness increases when users see institutional commitment to technological change.

Auditor competence emerged as another critical determinant. This finding echoes earlier research that links digital literacy and IT skills to enhanced technology uptake. The fact that auditors with stronger IT competencies are more confident and capable of using automated tools aligns with TPB's construct of perceived behavioural control, which posits that individuals adopt technologies when they feel capable of using them effectively.

Technological readiness, including system quality, cybersecurity infrastructure, and the presence of automated AIS also influences adoption. Firms with robust digital infrastructures are better positioned to integrate sophisticated tools such as CAATs, RPA, and analytics platforms. This suggests that adoption is not purely behavioral but also structural, requiring adequate organizational resources.

Finally, the review confirms that external pressures such as regulatory requirements and client technological sophistication shape adoption patterns. This indicates that audit firms do not operate in isolation; rather, adoption decisions are often responses to institutional and market expectations.

### ***5.2 Automated Audit Tools and Their Contribution to Audit Quality***

A key finding of the review is the consistent evidence that automated audit tools significantly enhance audit quality. This aligns with decades of audit research emphasizing the importance of technology in improving audit performance, especially as modern organizations become increasingly digital.

First, automated tools substantially improve the accuracy and reliability of audit evidence. By processing large datasets and minimizing human error, technologies such as CAATs, RPA, and data analytics enable auditors to conduct deeper and more precise analyses compared to traditional sampling techniques. These findings reinforce the argument that technology increases audit assurance by expanding data coverage and strengthening analytical capabilities.

Second, the review reveals that automated tools greatly enhance fraud detection. Evidence from developing and developed countries shows that auditors using CAATs and analytics tools are more effective in identifying anomalies, unusual trends, and high-risk transactions. This contributes to a stronger risk-based audit approach and aligns with prior literature showing that data analytics improves fraud risk assessment.

Third, the findings demonstrate that automated tools improve efficiency and timeliness. Tools such as RPA streamline repetitive audit tasks, allowing auditors to focus on higher-level professional judgments. This supports the broader theory that automation enables auditors to shift from manual, compliance-based tasks to analytical and assurance-driven roles.

Fourth, the review highlights improvements in internal control assessment, especially through AIS, blockchain systems, and continuous monitoring tools. These technologies strengthen traceability, enhance audit trails, and reduce the likelihood of undetected control failures.

Overall, the collective evidence shows that automated audit tools are integral to producing higher-quality audits, aligning with global trends in digital transformation across accounting and auditing.

### **5.3 Persistent Challenges Limiting Effective Adoption**

Despite the positive effects of automated tools, the review identifies several challenges that restrict widespread adoption, especially in developing countries. These challenges reflect broader structural, financial, and regulatory disparities across the audit profession. The most significant barrier is the digital skill gap among auditors. Many firms, particularly smaller ones, lack adequately trained staff capable of using advanced audit technologies. This skill deficiency results in auditor resistance, reflecting TPB's notion that low perceived behavioural control reduces behavioral intention to adopt new systems.

Financial constraints also limit adoption. High acquisition, implementation, and maintenance costs prevent small and medium audit firms from adopting sophisticated tools such as RPA or AI-based platforms. This financial divide contributes to inequalities in audit quality between large/global firms and smaller firms.

Another notable challenge is the presence of system risks, including cybersecurity threats, data integrity issues, and system failures. While advanced AIS infrastructure can enhance audit quality, poorly implemented systems may produce the opposite effect by creating vulnerabilities that compromise audit outcomes.

Technological infrastructure remains a barrier in many regions, with issues such as unstable internet connectivity, outdated hardware, and insufficient digital governance affecting adoption. This finding reinforces existing literature that links institutional digital maturity to audit technology implementation.

Finally, the lack of clear and comprehensive regulatory guidance on emerging technologies, especially AI, big data, and blockchain creates uncertainty for auditors and regulators. This regulatory gap slows down adoption and leaves firms hesitant about compliance, risk management, and professional liability.

### **5.4 The Future of Auditing: Emerging Technologies and Evolving Audit Quality**

The systematic review reveals that emerging technologies including AI, big data analytics, blockchain, and robotic process automation

are not only transforming current audit practices but are also redefining future audit quality frameworks.

AI and machine learning tools are expected to enhance auditors' decision-making by enabling predictive modelling, anomaly detection, and intelligent judgment support. Big data analytics will continue to shift auditing from sample-based testing to full-population analysis, increasing audit reliability and risk detection capabilities.

Blockchain technologies promise to revolutionize audit trails through the creation of immutable, transparent records, while smart contracts may automate certain aspects of control testing. Robotic process automation is likely to advance continuous auditing and real-time assurance, further improving audit efficiency and reducing manual workload.

These trends suggest that the integration of automated, intelligent, and data-driven tools will increasingly shape the future of audit quality. The profession is moving toward a landscape where technology not only supports audit processes but actively enhances their scope, depth, and precision.

## **6.0 IMPLICATIONS**

### **6.1 Theoretical Implication**

The findings of this systematic literature review generate several important theoretical implications for understanding technology adoption and audit quality within information systems environments. First, the study extends the applicability of the Theory of Planned Behaviour (TPB) to the auditing domain by demonstrating that auditors' decisions to adopt automated audit tools are strongly influenced by attitudes toward the usefulness of technology, subjective norms shaped by organizational expectations and

regulatory pressures, and perceived behavioural control linked to IT skills and technological readiness. This reinforces TPB's relevance in professional service settings and highlights the importance of integrating both individual-level psychological factors and organizational factors when explaining auditors' technology adoption behaviours.

Second, the study deepens the understanding of the Technology Acceptance Model (TAM) within the context of audit automation. The findings show that perceived usefulness and ease of use remain central drivers of adoption, but they are also moderated by industry-specific variables such as audit risk considerations, regulatory expectations, client system sophistication, and the need for high-quality audit evidence. This suggests that TAM may require contextual expansion to fully capture adoption behaviour in highly regulated, evidencebased professions such as auditing. The review therefore contributes to the refinement of TAM by highlighting the importance of domain-specific constructs such as auditor IT competence, audit firm digital culture, and system reliability.

Third, the results demonstrate that existing theoretical frameworks for technology adoption must account for infrastructure-level and structural determinants, including organizational digital readiness, cybersecurity safeguards, and the availability of automated AIS. These factors influence adoption in ways that are not fully captured by individual-based theories, suggesting the need for integrated multi-level models that connect behavioural theories with organizational and technological capability frameworks.

Finally, the study provides strong theoretical evidence that technology adoption is not merely a behavioural intention outcome but a key antecedent of audit quality enhancement. By showing that automated audit tools influence core dimensions of audit quality accuracy, fraud detection, efficiency, and internal control reliability, the review bridges technology adoption theories with audit quality theory. This connection suggests that future theoretical models should conceptualize automated audit tools not only as operational enablers but also as strategic assets that fundamentally shape audit effectiveness and assurance outcomes.

Overall, the theoretical implication of this study is that existing models like TPB and TAM remain useful but require contextual expansion to fully explain technology adoption in auditing. The adoption of automated tools is a multi-layered phenomenon that spans behavioural, organizational, and technological domains, and theoretical frameworks must evolve accordingly to reflect the digital transformation of the audit profession.

### 6.2 Practical Implications

The findings of this study offer several important practical implications for audit firms, professional accountants, regulators, and technology developers. First, the strong association between automated audit tools and improved audit quality indicates that audit firms should prioritize strategic investment in digital technologies such as CAATs, data analytics platforms, robotic process automation, and AI-assisted audit solutions. These tools have demonstrated clear benefits in terms of accuracy, fraud detection, and efficiency, making their adoption essential for maintaining competitiveness and meeting evolving client expectations.

Second, the results highlight the critical role of auditor competency in driving adoption. Audit firms should therefore invest in continuous training and capacity-building programs that strengthen auditors' IT skills, data analysis capabilities, and familiarity with emerging digital audit tools. Strengthening digital literacy will not only enhance adoption but also improve the overall quality of audit judgments and audit execution.

Third, the study underscores the importance of organizational culture and leadership support in facilitating technology adoption. Firms should cultivate a culture that encourages innovation, experimentation, and continuous learning, while leaders should actively champion digital transformation initiatives. Establishing clear policies, allocating resources for technology upgrades, and rewarding technological proficiency can significantly improve adoption outcomes.

Fourth, to reduce risks associated with automated systems such as cybersecurity threats and data integrity, concerns firms should implement robust IT governance structures, including strong internal controls, secure data management practices, and regular system audits. This is especially critical for firms operating in regions with underdeveloped technological infrastructure.

Fifth, regulators and professional bodies can play a supportive role by developing guidelines, standards, and best practices for the use of emerging technologies such as AI, blockchain, and big data analytics in auditing. Clear regulatory direction will help reduce uncertainty among firms and ensure consistent, high-quality application of new tools across the profession.

Finally, audit software developers and technology providers should use these findings to improve tool design, user-friendliness, and auditor-oriented functionalities. Enhancing system usability and providing technical support will increase adoption rates and improve the overall effectiveness of digital audit tools in practice.

Overall, this study demonstrates that the successful adoption of automated audit tools requires coordinated efforts across people, processes, technology, and regulation. Strengthening digital capabilities, cultivating supportive organizational environments, and improving infrastructure and governance will be critical for maximizing the impact of automated tools on audit quality.

### 7.0 CONCLUSION

This study examined the adoption of automated audit tools and their effect on audit quality within information systems, drawing on evidence from 36 empirical studies. The findings demonstrate that the use of technologies such as CAATs, data analytics, AI, blockchain, and robotic process automation significantly enhances audit quality by improving accuracy, strengthening fraud detection, increasing efficiency, and reinforcing internal control assessments. Adoption, however, is influenced by multiple factors,

including organizational support, auditor IT competence, technological readiness, and perceptions of usefulness. Despite these benefits, challenges such as skill gaps, high implementation costs, system risks, and limited regulatory guidance continue to restrict widespread adoption, particularly in developing regions. The review also highlights the transformative potential of emerging technologies, which are expected to further reshape audit processes and elevate the standards of audit quality in the future. Overall, this study underscores the need for audit firms, regulators, and professional bodies to invest in digital capabilities and supportive infrastructures to fully realize the benefits of automated audit tools.

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