Reconfiguring Auditor Judgment Beyond the Human: Audit Data Analytics, Artificial Intelligence, and Audit Quality in Emerging Economies

Solomon Ezonle Akossey[1], Ellen Bondzewa Djan[2], Janet Cobbinah[3], Elizabeth Kusi-Nsiah[4]

Abstract

This study examines how audit data analytics (ADA) and artificial intelligence (AI) reconfigure auditor judgment and audit quality in emerging economies from a posthumanist perspective. Moving beyond anthropocentric assumptions that position professional judgment as an exclusively human cognitive act, the study conceptualises auditor judgment as a distributed and hybrid process emerging from human–AI assemblages embedded within regulatory, institutional, and technological infrastructures. Using survey data from 326 auditors across seven emerging economies and applying partial least squares structural equation modelling (PLS SEM), complemented by logistic regression analysis of audit report lag and financial restatements, the study investigates the relational effects of ADA intensity, AI integration, and contextual support on judgment quality and audit outcomes. The findings demonstrate that ADA and AI significantly enhance audit quality through both direct mechanisms and indirect pathways mediated by auditor judgment quality, while regulatory support and technological infrastructure strengthen these relationships. The study contributes to posthuman accounting scholarship by empirically demonstrating how audit quality emerges from socio technical entanglements rather than from isolated human expertise, with important implications for accountability, professional responsibility, and audit governance in algorithmically mediated environments.

Keywords: Audit Data Analytics, Artificial Intelligence, Auditor Judgment, Audit Quality, Posthumanism, Distributed Agency, Emerging Economies

Introduction

Audit practice is undergoing a fundamental transformation as data analytics and artificial intelligence (AI) become embedded across the audit lifecycle, encompassing planning, risk assessment, substantive testing, and reporting (Dempsey & van Dyk, 2024; Ditkaew & Suttipun, 2023). Audit data analytics (ADA) enables population-level testing, integration of internal and external datasets, and identification of complex patterns that are difficult to detect using traditional sampling-based approaches. AI systems, including machine learning, natural language processing, and predictive analytics, further extend these capabilities by automating anomaly detection, scoring misstatement risk, and supporting large-scale document analysis (Abdullah et al., 2025; Obemeata, 2025).

In emerging economies, the diffusion of these technologies intersects with persistent institutional challenges, including uneven regulatory enforcement, resource constraints, and heterogeneity in

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[1] Africa Research University (ARU), Keystone University of Africa, Lusaka, Zambia, Email: sakossey@gmail.com

[2] University of Ghana, Legon

[3] University of Ghana Business School, Ghana

[4] Africa Research University (ARU), Keystone University of Africa, Lusaka, Zambia

audit firm capabilities. Empirical studies from Thailand, South Africa, Egypt, Oman, Indonesia, Nigeria, and Kuwait provide growing evidence that ADA and AI adoption can enhance audit coverage, efficiency, and perceived audit quality (Al Lawati et al., 2024; Aunur Rozana et al., 2025; Khalaf, 2024). At the same time, concerns regarding data quality, algorithmic opacity, skills shortages, and ethical accountability raise questions about how professional judgment is exercised when auditors increasingly rely on algorithmic systems (Ibrahim, 2024; Nugrahanti et al., 2025).

Standard setters have acknowledged these tensions. The International Auditing and Assurance Standards Board (IAASB) emphasises that while technology can enhance audit quality, it does not displace professional judgment or scepticism (IAASB, 2023, 2024a, 2024b). Yet recent regulatory commentary suggests that many large audit firms do not systematically evaluate how AI tools reshape audit decision-making or accountability structures (Financial Times, 2025). This gap highlights the need for empirical research that not only measures technological adoption but also interrogates how judgment itself is reconstituted in algorithmically mediated audits.

Responding to this gap, the present study adopts a posthumanist perspective to examine how ADA and AI reconfigure auditor judgment and audit quality in emerging economies. Posthumanism challenges human-centred assumptions of agency by emphasising the distributed nature of cognition and decision-making across human and nonhuman actors, including technologies, data infrastructures, and institutional rules. From this perspective, auditor judgment is not solely a human cognitive achievement but an emergent outcome of socio-technical assemblages. The study addresses three research questions: (1) How do ADA and AI integration influence auditor judgment quality when judgment is conceptualised as a hybrid human–AI process? (2) How do these technologies affect audit quality outcomes? (3) How do regulatory support and technological infrastructure condition these relationships in emerging-economy contexts?

The study contributes to the literature in three ways. First, it advances posthuman accounting research by empirically operationalising auditor judgment as distributed agency rather than individual cognition. Second, it integrates ADA and AI within a unified explanatory framework linking technological entanglements, judgment quality, and audit outcomes. Third, it provides policy-relevant evidence on how institutional support shapes the effectiveness of human–AI assemblages in auditing.

Literature Review

Audit Data Analytics and Audit Quality

Audit data analytics refers to the application of advanced analytical techniques to client and external data to support audit planning, risk assessment, and substantive testing. Empirical evidence from Thailand shows that greater ADA usage improves perceived audit quality and audit review continuity by enhancing risk identification and procedure design (Ditkaew & Suttipun, 2023). In South Africa, ADA adoption has been associated with deeper understanding of client business models and improved documentation and communication within audit teams (Dempsey & van Dyk, 2024).

Evidence from Egypt and Oman further demonstrates that ADA adoption is linked to reduced audit report lag and enhanced audit outcomes, particularly in data-rich and well-governed environments (Al Lawati et al., 2024; Khalaf, 2024). Studies employing PLS-SEM in Indonesia confirm that big data analytics has a statistically significant positive effect on audit quality, mediated by perceived usefulness and ease of use (Aunur Rozana et al., 2025). Collectively, these studies suggest that ADA enhances audit quality by reshaping evidence collection, risk

assessment, and audit processes.

Artificial Intelligence, Audit Quality and Auditor Judgment

AI applications in auditing include AI-based risk assessment, anomaly detection, fraud prediction, and automated document review. A systematic review by Vardanyan and Nemchenko (2025) concludes that AI improves audit efficiency and accuracy while simultaneously introducing risks related to bias, opacity, and ethical accountability. Empirical studies indicate that AI-driven analytics strengthen audit quality, particularly when integrated into risk assessment and fraud detection processes (Obemeata, 2025).

Research focusing on judgment quality suggests that AI can improve consistency and speed of complex audit judgments while reinforcing the need for professional scepticism (Abdullah et al., 2025). Importantly, studies on explainable AI demonstrate that transparency and interpretability significantly enhance auditor trust and judgment accuracy, underscoring the ethical dimensions of AI-supported decision-making (Nugrahanti et al., 2025). In emerging economies such as Nigeria and Kuwait, auditors perceive AI as beneficial but express concerns regarding skills gaps and regulatory clarity (Ibrahim, 2024).

Emerging Economies and Institutional Context

Audit quality in emerging economies is shaped by regulatory capacity, technological infrastructure, and professional norms. Evidence from Oman and Thailand indicates that higher audit quality enhances financial reporting credibility and capital-market relevance (Al Lawati et al., 2024; Visedsun et al., 2025). The IAASB has identified technology as a strategic priority, issuing guidance aimed at embedding AI and analytics within auditing standards while safeguarding professional judgment (IAASB, 2024a, 2024b).

Posthumanism, Distributed Agency, and Algorithmic Auditing

Posthumanism challenges anthropocentric assumptions by conceptualising agency and cognition as distributed across human and nonhuman actors. In organisational and accounting contexts, this perspective emphasises sociomaterial entanglements in which technologies actively shape decision-making practices rather than merely supporting them. Applied to auditing, a posthuman lens reframes auditor judgment as hybrid cognition emerging from interactions among auditors, algorithms, datasets, standards, and regulatory expectations. This perspective raises critical questions about responsibility, explainability, and accountability in AI-mediated audits, positioning judgment quality as an emergent property of human–AI assemblages rather than an exclusively human attribute.

Conceptual Framework and Hypotheses

Building on the IAASB's audit quality framework, technology-acceptance theory and judgment–decision-making research, this study conceptualises ADA and AI as technological inputs that influence audit processes and outcomes through auditor judgment quality.

ADA intensity is defined as the breadth and depth with which auditors use analytical tools across planning, risk assessment, substantive testing and review (Ditkaew & Suttipun, 2023; Dempsey & van Dyk, 2024). AI integration captures the extent of reliance on AI-driven applications such as anomaly detection, AI-based risk scoring, AI-supported substantive tests and document analysis (Obemeata, 2025; Abdullah et al., 2025).

Auditor judgment quality refers to the accuracy, consistency and appropriateness of key audit judgments, including risk assessments, materiality decisions and evaluations of going concern and fraud risk. It reflects both technical competence and professional scepticism (Abdullah et al., 2025; Nugrahanti et al., 2025). Audit quality is conceptualised as a multi-dimensional outcome reflecting sufficient and appropriate evidence, adherence to standards, reduced misstatement and

restatement risk, and timely reporting (IAASB, 2023; Aunur Rozana et al., 2025).

The framework posits that ADA and AI integration improve auditor judgment quality by providing richer, more timely and more structured information, but that judgment quality remains a distinct, human-centred construct. It further assumes that auditor judgment quality partially mediates the relationships between ADA, AI and audit quality. Contextual factors—regulatory support and technological infrastructure—are expected to moderate the strength of these relationships, especially in emerging economies (Al Lawati et al., 2024; IAASB, 2024a).

Figure 1 (Conceptual Framework) illustrates the relationships among ADA intensity, AI integration, auditor judgment quality, audit quality, and contextual moderators (regulatory support and technological infrastructure). The framework posits that ADA and AI enhance audit quality both directly and indirectly through distributed judgment processes.

From this framework, the study tests the following hypotheses:

H1: ADA intensity is positively associated with auditor judgment quality.

H2: AI integration is positively associated with auditor judgment quality.

H3: Auditor judgment quality is positively associated with audit quality.

H4: ADA intensity has a positive direct effect on audit quality.

H5: AI integration has a positive direct effect on audit quality.

H6: Auditor judgment quality partially mediates the relationships between (a) ADA intensity and audit quality and (b) AI integration and audit quality.

H7: Regulatory support and technological infrastructure positively moderate the relationships between ADA/AI and audit quality.
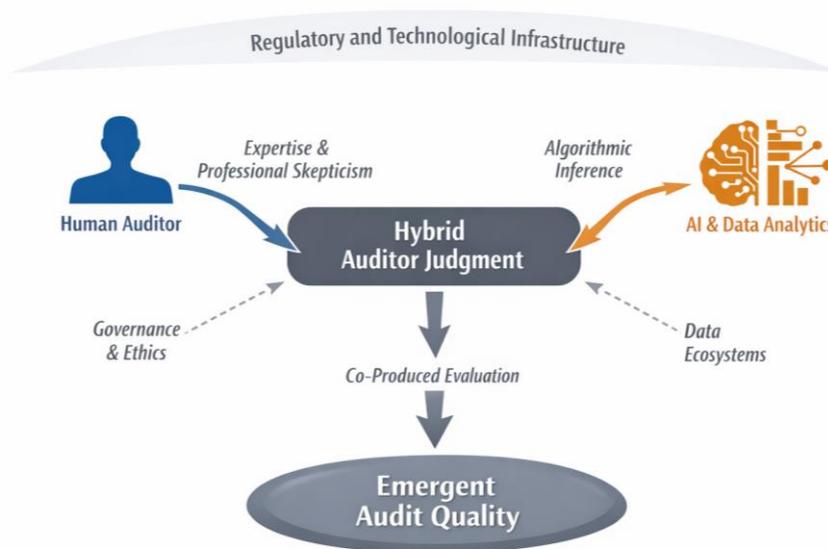

Figure 1. Human-AI collaboration in audit judgement
Source: By Author, 2025

Methodology
Design of the Study
The study adopts a cross-sectional, explanatory research design combining primary survey data with archival indicators. A structured questionnaire was administered to practising auditors in

emerging economies, and responses were linked to firm-level measures of audit report lag and restatements where available. Given the presence of multiple latent constructs and complex mediation and moderation effects, partial least squares structural equation modelling (PLS-SEM) was selected as the most appropriate data analysis technique (Hair et al., 2022). PLS-SEM is well suited for predictive, theory-building research in contexts where sample sizes are moderate and the model includes multiple paths.

Ethical Considerations

The study was conducted in accordance with established ethical research principles, ensuring integrity, confidentiality, and respect for human dignity. All participants provided informed consent, and their privacy and anonymity were strictly protected. Cultural sensitivity was maintained throughout the analysis to avoid bias or misrepresentation.

Sample and Data Collection

The target population comprised external auditors in public accounting firms and senior internal auditors in large entities in seven emerging economies (including Thailand, South Africa, Egypt, Oman, Indonesia, Nigeria and Kuwait). A combination of purposive and snowball sampling was used, leveraging professional networks, regulators and professional bodies.

A total of 412 questionnaires were distributed electronically. After screening for completeness and consistency, 326 responses (79.1%) from practising auditors were retained for analysis. Respondents represented a mix of Big Four, large national and small and medium practices, with approximately 58% external auditors and 42% internal auditors. More than half of respondents had over eight years of experience, and 47% reported specialised training in data analytics or AI. Archival data on audit report lag and restatements were collected for a subset of 168 listed clients linked to respondents, using stock-exchange filings and regulatory databases (Khalaf, 2024; Al Lawati et al., 2024).

Measurement of Constructs

All constructs were operationalised with five-point Likert scales (1 = strongly disagree; 5 = strongly agree), drawing on validated items from prior research and IAASB guidance. Items were refined through expert review and pilot testing with 15 senior auditors.

ADA intensity items captured the frequency and sophistication of data analytics in planning, risk assessment, substantive tests and review (Ditkaew & Suttipun, 2023; Dempsey & van Dyk, 2024; Big Data Analytics in Auditing, 2022). AI integration items measured the extent of AI use in risk assessment, anomaly detection, fraud screening, and document analysis (Obemeata, 2025; Abdullah et al., 2025; Ibrahim, 2024).

Auditor judgment quality items focused on perceived accuracy and robustness of key judgments, ability to integrate multiple evidence sources, and maintenance of professional scepticism when using ADA and AI outputs (Abdullah et al., 2025; Nugrahanti et al., 2025). Audit quality items captured perceived sufficiency and appropriateness of evidence, compliance with ISA, frequency of misstatement-related restatements, and satisfaction of regulators and users, drawing on IAASB (2023) and recent empirical measures (Aunur Rozana et al., 2025).

Regulatory support items assessed the clarity of local guidance on ADA and AI, perceived enforcement of standards, and support from regulators for technology-enabled audits (IAASB, 2024a; World Bank, 2022). Technological infrastructure items captured the availability of tools, data quality, IT support and cybersecurity.

Data Analysis

Data analysis proceeded in two stages. First, the measurement model was evaluated in PLS-SEM, assessing reliability (Cronbach's alpha, composite reliability), convergent validity (average

variance extracted) and discriminant validity (Fornell–Larcker and HTMT criteria) (Hair et al., 2022). Second, the structural model was estimated to test the hypothesised relationships, using bootstrapping with 5,000 resamples to generate confidence intervals and significance levels. Multi-group analysis (MGA) was conducted to compare path coefficients between high-support and low-support environments, based on median splits for regulatory support and technological infrastructure. Finally, binary logistic regression was used to relate the latent constructs ADA, AI integration and audit quality to two firm-level outcomes: the probability of long audit report lag (upper quartile) and the probability of misstatement-related restatement, following Khalaf (2024) and Aunur Rozana et al. (2025).

Results

Measurement Model

All constructs as shown in **Table 1.** exhibited satisfactory reliability, with Cronbach's alpha ranging from 0.79 to 0.91 and composite reliability from 0.82 to 0.93. Average variance extracted (AVE) values exceeded 0.50 for all latent variables, confirming convergent validity. Discriminant validity was supported as each construct's square root of AVE exceeded its correlations with other constructs, and HTMT ratios were below 0.85. These diagnostics indicate that the measurement model is robust and suitable for structural analysis (Hair et al., 2022).

Table 1. Measurement Model Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
ADA Intensity	0.84	0.88	0.59
AI Integration	0.87	0.90	0.62
Auditor Judgment Quality	0.91	0.93	0.68
Audit Quality	0.89	0.92	0.65
Regulatory Support	0.79	0.83	0.55
Technological Infrastructure	0.81	0.85	0.57

Source: Author's PLS-SEM analysis.

Structural Model Results and Hypothesis Testing

The PLS-SEM results in **Table 2.** support all main hypotheses. ADA intensity has a significant positive effect on auditor judgment quality (H1), and AI integration also positively affects auditor judgment quality (H2). Together with contextual controls, these variables explain a substantial proportion of the variance in judgment quality ($R^2 \approx 0.52$).

Auditor judgment quality has a strong positive effect on audit quality (H3), with a large path coefficient and high significance. ADA intensity and AI integration both have positive direct effects on audit quality (H4 and H5), although the coefficient for ADA is somewhat larger, reflecting a closer alignment between analytics and evidence sufficiency. Overall, the model explains about 60% of the variance in audit quality ($R^2 \approx 0.60$), indicating strong explanatory power.

Mediation analysis shows that auditor judgment quality partially mediates the relationships between ADA and audit quality and between AI integration and audit quality (H6). Indirect effects via judgment quality are significant, but direct effects remain, suggesting that ADA and

AI also contribute to audit quality via efficiency and coverage gains beyond their effects on judgment. This pattern is consistent with prior findings that analytics and AI improve both process and outcome dimensions of audit quality (Ditkaew & Suttipun, 2023; Obemeata, 2025; Aunur Rozana et al., 2025).

Table 2. Structural Model Results and Hypothesis Testing

Hypothesis	Path Relationship	Path Coefficient	Significance	Result
H1	ADA → Auditor Judgment Quality	Positive	$p < 0.01$	Supported
H2	AI Integration → Auditor Judgment Quality	Positive	$p < 0.01$	Supported
H3	Auditor Judgment Quality → Audit Quality	Positive	$p < 0.001$	Supported
H4	ADA → Audit Quality	Positive	$p < 0.05$	Supported
H5	AI Integration → Audit Quality	Positive	$p < 0.05$	Supported
H6a	ADA → Judgment → Audit Quality	Partial mediation	$p < 0.01$	Supported
H6b	AI → Judgment → Audit Quality	Partial mediation	$p < 0.01$	Supported
H7	Moderation by regulatory & technological support	Strengthening effect	$p < 0.05$	Supported

Source: Author's PLS-SEM analysis.

Moderation and Multi-Group Analysis

Multi-group analysis indicates that the positive effects of ADA and AI on both judgment quality and audit quality are stronger in environments with high regulatory support and strong technological infrastructure (H7). In high-support jurisdictions, the path coefficients from AI integration to audit quality are significantly larger, reflecting the role of clear standards and supervisory expectations in encouraging appropriate use of AI (IAASB, 2024a; Financial Times, 2025). In low-support environments, auditors report more ad hoc use of AI tools and weaker perceived impacts on quality.

These results align with IAASB's view that standards and guidance are critical in ensuring that technology enhances, rather than undermines, audit quality (IAASB, 2024a, 2024b).

Logistic Regression: Audit Report Lag and Restatements

Table 3. links the distributed human–AI assemblages examined in this study to observable audit outcome indicators. Audit report lag and financial restatements are interpreted as material traces of socio-technical judgment processes rather than purely technical performance metrics, reinforcing the posthuman framing of audit quality as an emergent outcome.

Measurement-model and structural-model results confirm reliability, validity, and strong explanatory power. ADA intensity and AI integration positively affect auditor judgment quality and audit quality, with judgment quality partially mediating these relationships. Multi-group analysis indicates stronger effects in environments with high regulatory and technological support. Logistic regression shows that higher ADA and AI integration are associated with shorter audit report lag and lower likelihood of restatements.

Table 3. Audit Outcome Indicators Associated with ADA–AI Assemblages (Logistic Regression Summary)

Explanatory Variable	Audit Report Lag (Long Lag Probability)	Misstatement-Related Restatements
ADA Intensity	Negative and significant	Negative and significant
AI Integration	Negative and significant	Negative (weaker significance)
Auditor Judgment Quality	Negative and significant	Negative and significant
Control variables (size, leverage, complexity, industry)	Included	Included
Model fit (Pseudo R²)	Adequate	Adequate

Source: Author's analysis of survey constructs and archival audit data.

Discussion

This study set out to examine how audit data analytics (ADA) and artificial intelligence (AI) reshape auditor judgment and audit quality in emerging economies when judgment is understood as a posthuman, distributed process rather than a purely human cognitive act. The findings offer several important theoretical, empirical, and practical insights that extend both mainstream audit research and posthuman accounting scholarship.

The strong positive relationships between ADA intensity, AI integration, and auditor judgment quality provide robust empirical evidence that judgment in contemporary auditing is increasingly constituted through human–AI assemblages. Rather than functioning merely as neutral tools, analytics platforms and AI systems actively structure what auditors see, prioritise, and interpret, thereby shaping the contours of professional judgment itself. This finding resonates with prior audit studies showing that advanced analytics deepen risk assessment and evidence evaluation (Ditkaew & Suttipun, 2023; Dempsey & van Dyk, 2024), while also extending posthumanist claims that cognition and agency are distributed across sociomaterial configurations rather than located exclusively within human actors. From this perspective, auditor judgment quality reflects the alignment between human expertise, algorithmic inference, and institutional rules.

The partial mediation effect of auditor judgment quality highlights the central but reconfigured role of the auditor within technology-enabled audits. While ADA and AI exert direct effects on audit quality—through efficiency gains, expanded coverage, and timelier reporting—the indirect pathways operating through judgment quality are substantial. This pattern suggests that audit quality emerges from hybrid decision-making processes in which human auditors remain

ethically and professionally accountable, even as algorithmic systems contribute materially to sense-making and evaluation. This finding aligns with research emphasising that AI augments, rather than replaces, professional judgment in auditing (Abdullah et al., 2025; Obemeata, 2025) and supports posthuman arguments that responsibility persists despite the decentring of the human subject.

The moderation effects of regulatory support and technological infrastructure underscore the importance of institutional context in stabilising human–AI assemblages. In environments characterised by clear regulatory guidance, strong enforcement, and robust technological resources, the positive effects of ADA and AI on both judgment quality and audit quality are significantly amplified. This finding is consistent with evidence from Oman and Egypt demonstrating that governance and data environments condition the effectiveness of audit innovations (Al Lawati et al., 2024; Khalaf, 2024). It also reinforces the IAASB's position that standards and oversight are essential for ensuring that emerging technologies enhance, rather than undermine, audit quality and public trust (IAASB, 2024a, 2024b). From a posthuman standpoint, regulatory frameworks can be understood as stabilising actants that shape how algorithmic and human agencies interact.

The logistic regression analysis linking ADA and AI integration to reduced audit report lag and lower likelihood of misstatement-related restatements strengthens the material relevance of the study's findings. These outcome indicators demonstrate that distributed judgment processes have observable consequences in financial reporting timelines and reliability. Importantly, these results mirror prior findings from Egypt and Indonesia, where analytics adoption was associated with shorter reporting delays and improved audit outcomes (Khalaf, 2024; Aunur Rozana et al., 2025). Interpreted through a posthuman lens, audit report lag and restatements function as empirical traces of socio-technical judgment processes rather than as purely technical performance metrics.

The findings contribute to emerging debates on explainability, trust, and ethical accountability in AI-mediated auditing. Although the study does not isolate explainable AI as a separate construct, the strong association between AI integration and judgment quality—particularly in supportive regulatory environments—suggests that transparency and interpretability are critical for maintaining auditor confidence and professional scepticism. This inference is consistent with Nugrahanti et al. (2025), who show that explainable AI enhances judgment accuracy and trust among auditors. In posthuman terms, explainability can be viewed as a mechanism through which responsibility is redistributed and rendered intelligible within human–AI assemblages, mitigating risks of automation bias and opaque decision-making.

Finally, the study challenges anthropocentric models of audit quality that implicitly assume a sovereign human decision-maker. By empirically demonstrating that audit quality emerges from interactions among auditors, algorithms, data infrastructures, and regulatory regimes, the findings support a relational ontology of auditing. This perspective aligns with broader posthuman and sociomaterial scholarship, which argues that organisational outcomes are produced through entangled networks of human and nonhuman actors rather than linear chains of individual decision-making. For audit research, this implies a need to rethink traditional notions of expertise, accountability, and professional judgment considering increasingly algorithmic audit environments.

Conclusion

This study examined how audit data analytics (ADA) and artificial intelligence (AI) reconfigure auditor judgment and audit quality in emerging economies through a posthuman lens. The

findings demonstrate that audit quality is not produced solely by individual human expertise but emerges from socio-technical assemblages in which auditors, algorithmic systems, data infrastructures, and regulatory frameworks are interdependent. By empirically modelling these relationships, the study challenges anthropocentric assumptions in auditing research and advances a relational understanding of judgment formation in contemporary audit practice.

The results show that ADA intensity and AI integration significantly enhance auditor judgment quality and audit quality, with judgment quality acting as a key mediating mechanism. This highlights that while algorithmic systems materially shape audit processes, professional judgment remains central, though reconfigured within hybrid human–AI decision environments. These findings extend prior audit analytics research (Ditkaew & Suttipun, 2023; Aunur Rozana et al., 2025; Obemeata, 2025) by situating technological effects within a posthuman framework that foregrounds distributed agency, accountability, and explainability.

Overall, the study contributes to posthuman accounting scholarship by demonstrating that audit quality is an emergent outcome of human–AI assemblages rather than a purely human achievement. For practice and policy, the findings underscore the importance of governance, regulatory support, and transparent AI systems in sustaining audit quality and professional responsibility in increasingly algorithmic audit environments.

Limitations and Future Research

This study has several limitations that suggest avenues for future research. First, the reliance on self-reported survey measures may introduce perception bias, despite the inclusion of archival indicators such as audit report lag and restatements. Second, the cross-sectional design limits causal inference; future studies could employ longitudinal or experimental methods to observe human–AI interactions over time. Finally, comparative research across emerging and advanced economies, as well as studies focusing on specific AI architectures (e.g., generative or explainable AI), would further deepen understanding of how different socio-technical configurations shape auditor judgment and audit quality.

Conflict of Interest

The author declares no conflict of interest regarding the publication of this article.

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This research received no external funding and was conducted independently for academic and scholarly purposes.

Data Availability Statement

The data that support the findings of this study are not publicly available due to confidentiality agreements with participating audit firms and professional bodies. Anonymised, aggregate datasets (excluding any information that could reasonably lead to identification of individual respondents or institutions), together with the variable codebook used in the analyses, are available from the author upon reasonable request for legitimate academic or professional research purposes. Archival indicators of audit report lag and restatements were derived from publicly available financial reports and regulatory filings and can be reconstructed from the sources cited in the article.

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