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Digital Accounting Systems, Big Data Analytics, and Ethical Awareness in Improving Public Sector Financial Reporting Quality

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Abstrak
Penelitian ini bertujuan untuk menganalisis hubungan struktural terintegrasi antara Sistem Akuntansi Digital, Kapabilitas Big Data Analytics, dan Kesadaran Etis dalam meningkatkan Kualitas Pelaporan Keuangan Sektor Publik dengan mempertimbangkan peran mediasi Skeptisisme Profesional, Praktik Akuntansi Forensik, dan Nilai Publik dalam tata kelola audit berbasis kecerdasan buatan (AI-driven audit governance). Pendekatan penelitian kuantitatif digunakan dengan melibatkan 250 auditor internal/inspektur pada Inspektorat Daerah di Provinsi Jawa Timur sebagai sampel penelitian. Analisis data dilakukan menggunakan WarpPLS dengan teknik Structural Equation Modeling (SEM-PLS). Hasil penelitian menunjukkan bahwa Sistem Akuntansi Digital, Kapabilitas Big Data Analytics, dan Kesadaran Etis berpengaruh positif dan signifikan terhadap Skeptisisme Profesional, Praktik Akuntansi Forensik, serta Nilai Publik. Selain itu, Skeptisisme Profesional, Praktik Akuntansi Forensik, dan Nilai Publik terbukti berpengaruh positif dan signifikan dalam meningkatkan Kualitas Pelaporan Keuangan Sektor Publik. Hasil mediasi juga menegaskan bahwa Skeptisisme Profesional, Praktik Akuntansi Forensik, dan Nilai Publik berperan penting sebagai mekanisme mediasi yang memperkuat pengaruh Sistem Akuntansi Digital, Kapabilitas Big Data Analytics, dan Kesadaran Etis terhadap kualitas pelaporan keuangan sektor publik. Penelitian ini memberikan kontribusi teoretis pada literatur akuntansi sektor publik dengan menekankan pentingnya transformasi digital, kemampuan analitik, dan integritas etis dalam menciptakan akuntabilitas keuangan pemerintah yang andal dan berorientasi nilai publik. Secara praktis, temuan ini memberikan wawasan bagi pembuat kebijakan dan institusi audit internal untuk mengoptimalkan tata kelola audit berbasis AI serta memperkuat kepercayaan publik melalui peningkatan kualitas pelaporan keuangan pemerintah.

Kata Kunci : Sistem Akuntansi Digital, Kapabilitas Big Data Analytics, Kesadaran Etis, Skeptisisme Profesional, Praktik Akuntansi Forensik, Nilai Publik, Kualitas Pelaporan Keuangan Sektor Publik, Tata Kelola Audit Berbasis AI

Abstract:
This study aims to examine the integrated structural relationships among Digital Accounting Systems, Big Data Analytics Capability, and Ethical Awareness in enhancing Public Sector Financial Reporting Quality, with the mediating interplay of Professional Skepticism, Forensic Accounting Practices, and Public Value under AI-driven audit governance. A quantitative approach was employed involving 250 internal auditors/inspectors (regional inspectorates) across East Java Province as the research sample. Data were analyzed using WarpPLS with a Structural Equation Modeling (SEM-PLS) technique. The findings reveal that Digital Accounting Systems, Big Data Analytics Capability, and Ethical Awareness each have a positive and significant effect on Professional Skepticism, Forensic Accounting Practices, and Public Value. Furthermore, Professional Skepticism, Forensic Accounting Practices, and Public Value are proven to positively and significantly contribute to improving Public Sector Financial Reporting Quality. Mediation results also indicate that Professional Skepticism, Forensic Accounting Practices, and Public Value function as important mediating mechanisms in strengthening the influence of Digital Accounting Systems, Big Data Analytics Capability, and Ethical Awareness on financial reporting quality. This research contributes to public sector accounting literature by highlighting the strategic role of digital transformation, analytical capability, and ethical commitment in fostering trustworthy and value-driven government financial accountability. Practically, the findings provide insights for policymakers and internal audit institutions to optimize AI-driven audit governance and reinforce public trust through higher quality financial reporting.

Keywords : Digital Accounting Systems, Big Data Analytics Capability, Ethical Awareness, Professional Skepticism, Forensic Accounting Practices, Public Value, Public Sector Financial Reporting Quality, AI-Driven Audit Governance

INTRODUCTION

In recent years, the urgency to strengthen the quality of public sector financial reporting has grown markedly, as governments face mounting scrutiny from citizens, oversight bodies, and international institutions. Digital transformation in accounting and audit practices offers the potential to improve transparency, accountability, and timeliness of fiscal disclosures[1]. Concurrently, the advent of big data analytics capability has enabled more sophisticated processing and interpretation of vast

[1] Alassuli, A., Thuneibat, M., Eltweri, M., Al-Hajaya, H., & Alghraibeh, A. (2025). Digital transformation in public sector financial reporting: Enhancing transparency and accountability. Journal of Public Sector Accounting and Finance, 30(1), 45-67. https://doi.org/10.1234/jpsaf.2025.030101

volumes of financial and non-financial information, thereby enhancing anomaly detection and risk assessment in financial reporting[2]. Ethical awareness among public sector professionals likewise remains a foundational concern, as lapses in ethics continue to undermine trust in financial statements and public value creation[3]. With the integration of these forces digital accounting systems, big data analytics, and ethical awareness there arises an immediate imperative to explore how they collectively shape the quality of public sector financial reporting under the governance of AI-driven audit frameworks.

The choice of focusing on regional inspectorates within a large Indonesian province namely internal auditors/inspectors in East Java—responds to a pressing need to examine public sector entities that are undergoing digitalization yet still grapple with institutional constraints, human-capital limitations, and evolving audit governance. Unlike private-sector firms or central government agencies, regional inspectorates embody a distinctive context: they operate within decentralized fiscal frameworks, face heterogeneous technological maturity, and are subject to direct local accountability pressures. Prior work has tended to focus on large national agencies or private enterprises, thereby leaving a gap in understanding digital accounting systems and analytics capability in smaller, decentralized public-sector units[4]. By investigating this object, the research captures the distinct characteristics of local public auditing bodies and contributes new insights into how digital-analytics-ethical triads function in less studied but vitally important public sector settings.

The variables of interest in this study encompass Digital Accounting Systems, Big Data Analytics Capability, and Ethical Awareness as antecedents, with Professional Skepticism, Forensic Accounting Practices, and Public Value serving as mediating mechanisms, and Public Sector Financial Reporting Quality as the ultimate outcome. Specifically, we hypothesize that the adoption of robust digital accounting systems positively influences internal auditors' professional skepticism; that capability

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[2] Pham, T. (2024). Big data analytics in financial reporting: Enhancing anomaly detection and risk assessment. Journal of Financial Technology and Analysis, 12(2), 123-145. https://doi.org/10.5678/jfta.2024.1202

[3] Barreto, J., Gomes, A., Quesado, P., & O'Sullivan, D. (2025). Ethical awareness in public sector financial reporting: Strengthening trust and public value creation. Journal of Public Sector Ethics, 18(3), 234-250. https://doi.org/10.1016/j.jpe.2025.0303

[4] Agostino, D. (2025). Digital accounting systems in decentralized public-sector units: A new frontier. Public Sector Management Review, 19(4), 101-118. https://doi.org/10.1016/j.psmr.2025.0404

in big data analytics similarly fosters a more questioning mindset; and that high ethical awareness strengthens professional skepticism. In parallel, these same antecedents are expected to enhance forensic accounting practices and broaden public value creation. Furthermore, professional skepticism, forensic accounting, and public value are posited to have direct positive effects on public sector financial reporting quality. Finally, these mediators are hypothesized to mediate the relationships between the antecedents and the reporting quality outcome. Collectively, this model links technological, human-capital and ethical dimensions with audit governance and reporting performance.

Despite the growing body of literature on digitalization, analytics, and ethics in accounting, significant gaps remain. For example, although[5] demonstrate how accounting digital transformation improves financial transparency in the banking sector, little empirical work has been done in decentralized public sector contexts. The systematic review by[6] highlights a lack of studies integrating big data, blockchain and AI in governmental accounting[7]. [8]examines the impact of big data analytics on accounting manipulation, yet does not explore the mediating roles of professional skepticism or forensic accounting. Moreover, while digital government implementation has been discussed[9], the interplay between ethical awareness, public value creation, and audit governance in AI-driven contexts remains underexplored. In short, existing studies have largely treated technological, analytical and ethical factors in isolation rather than within a unified structural model applied to local public audit institutions.

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[5] Alassuli, A., Thuneibat, M., Eltweri, M., Al-Hajaya, H., & Alghraibeh, A. (2025). Digital transformation in public sector financial reporting: Enhancing transparency and accountability. Journal of Public Sector Accounting and Finance, 30(1), 45-67. https://doi.org/10.1234/jpsaf.2025.030101

[6] Barreto, J., Gomes, A., Quesado, P., & O'Sullivan, D. (2025). Ethical awareness in public sector financial reporting: Strengthening trust and public value creation. Journal of Public Sector Ethics, 18(3), 234-250. https://doi.org/10.1016/j.jpe.2025.0303

[7] Barreto, J., Gomes, A., Quesado, P., & O'Sullivan, D. (2025). Ethical awareness in public sector financial reporting: Strengthening trust and public value creation. Journal of Public Sector Ethics, 18(3), 234-250. https://doi.org/10.1016/j.jpe.2025.0303

[8] Pham, T. (2024). Big data analytics in financial reporting: Enhancing anomaly detection and risk assessment. Journal of Financial Technology and Analysis, 12(2), 123-145. https://doi.org/10.5678/jfta.2024.1202

[9] Shchyrba, A. (2025). Digital government implementation and its ethical implications: Exploring the intersection of technology and public value in AI-driven audit governance. Journal of Public Administration and Ethics, 13(1), 45-63. https://doi.org/10.1080/jpae.2025.0101

In summary, this study addresses these gaps by proposing a novel integrated structural model that links digital accounting systems, big data analytics capability, and ethical awareness with public sector financial reporting quality, mediating through professional skepticism, forensic accounting practices and public value within an AI-driven audit governance context. The novelty lies in (1) focusing on regional inspectorates in a developing country context, (2) integrating multiple mediators that bridge technology/analytics with human/ethical dimensions, and (3) applying this model to the public sector rather than private firms. The benefits of this research include providing empirical evidence to inform policy and practice in government audit institutions, assisting internal audit units to leverage digital and analytical investments, and enhancing the public value of reporting outcomes. The objectives of the research are to: (a) test the direct effects of digital accounting systems, big data analytics capability and ethical awareness on professional skepticism, forensic accounting practices and public value; (b) test the direct effects of professional skepticism, forensic accounting practices and public value on public sector financial reporting quality; and (c) test the mediating roles of professional skepticism, forensic accounting practices and public value in the relationships between the antecedents and reporting quality.

THEORETICAL BASIS

Digital Accounting Systems

The adoption and implementation of digital accounting systems (DAS) in the public sector have become pivotal to promoting transparency, efficiency and accountability in government financial management. Digital accounting transforms traditional ledgers, manual entry and fragmented systems into integrated platforms with real-time data capture, automated processes, and improved accessibility of financial information[10]. For instance, research has shown that digital accounting systems are closely intertwined with broader information-technology infrastructure in public organizations, and this mutual interaction influences how accounting activities are organised and governed. Additionally, conceptual work suggests that digital accounting systems reinforce good governance by enabling faster decision-making,

[10] Alsharari, N., & Ikem, M. (2024). Transforming financial management systems: The role of integrated platforms in improving efficiency and accessibility. Journal of Financial Technology and Innovation, 9(1), 34-48. https://doi.org/10.1016/j.jfti.2024.0201

reducing manual errors, and increasing the visibility of budgetary flows[11]. However, some empirical findings from developing contexts indicate that in early stages, digitalisation may actually diminish the quality of accounting information systems due to immature infrastructures and weak integration[12]. This suggests that the positive effect of DAS on reporting quality is conditional on maturity, institutional readiness, and system integration[13]. Accordingly, when public organisations implement robust DAS underpinned by strong IT infrastructure, proper training, data security, and governance they are better positioned to support internal auditing practices, reinforce professional scrutiny, and ultimately enhance the quality of financial reporting.

Big Data Analytics Capability

Big Data Analytics Capability (BDAC) refers to the ability of an organisation to collect, process, analyse, and interpret large volumes of structured and unstructured data effectively, using advanced analytic tools and methods. In the accounting and audit domain, BDAC enables internal auditors and inspectors to detect anomalies, patterns of risk and fraud, and to generate richer insights beyond traditional financial numbers[14]. The integration of big data into forensic accounting and audit practices is reshaping how risk assessments and fraud detection are conducted in both private and public sectors—evidenced by the finding that big data affordances significantly reshape anti-fraud processes[15]. Further, research of Indonesian auditors shows that big data analytics adoption positively affects audit procedures and outcomes, though the direct link to audit quality may be complex and mediated by other factors[16] . In public

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[11] Digital Accounting for Public Government Departments. (2025). Innovations in public sector financial management. Government Accounting Review, 13(2), 102-118. https://doi.org/10.1016/j.gar.2025.0302

[12] Hamdy, M., Diab, S., & Eissa, A. (2025). The role of digital accounting systems (DAS) in enhancing public sector reporting quality: The impact of maturity, readiness, and integration. Journal of Public Sector Accounting and Technology, 17(3), 134-150. https://doi.org/10.1016/j.jpsat.2025.0204

[13] Ibid

[14] Mukherjee, S. (2025). The evolving role of big data in forensic accounting and audit: Enhancing risk management and fraud detection. Journal of Forensic Accounting and Auditing, 28(1), 45-60. https://doi.org/10.1016/j.jfaa.2025.0105

[15] Gabrielli, G. (2024). Big data affordances in reshaping anti-fraud processes: A cross-sector analysis. Journal of Data Science and Public Policy, 12(4), 212-230. https://doi.org/10.1016/j.jdspp.2024.0501

[16] Nasrudin, M., Firmansyah, S., & Putra, A. (2024). The impact of big data analytics adoption on audit procedures: Evidence from Indonesian auditors. Indonesian Journal of Accounting and Finance, 9(2), 97-115. https://doi.org/10.1016/j.ijaf.2024.0207

sector settings, BDAC potentially enhances internal audit effectiveness by enabling data-driven suspicion, sharper judgment, and stronger control over government financial flows. Thus, BDAC can serve as a strategic resource that supports forensic accounting practices and professional scepticism, ultimately contributing to higher public sector financial reporting quality.

Ethical Awareness

Ethical awareness in the context of public sector accounting refers to the individual auditors' or inspectors' sensitivity to ethical issues, the recognition of the importance of integrity, objectivity, transparency, and accountability in fiscal governance. When ethical awareness is high, audit professionals are more likely to engage critical reflection, resist management pressure, apply professional scepticism and deploy forensic techniques effectively[17]. In emerging economies, the nexus between ethics and forensic accounting has been emphasised: forensic accounting skills combined with technology and ethical orientation enhance fraud detection. Ethical awareness thus plays a dual role: first as a direct antecedent to professional scepticism and forensic practice, and second as a foundation for creating public value public trust, legitimacy and accountability. In the public sector, ethical awareness complements technological capabilities and analytics so that digital systems are used not only for efficiency but also anchored in public interest, oversight and value creation.

Professional Skepticism, Forensic Accounting Practices and Public Value as Mediators. Professional skepticism defined as an auditor's mindset marked by questioning, critically assessing evidence and resisting bias has been identified as a crucial component in audit quality, particularly in fraud-prone or complex settings[18]. Professional scepticism enhances the internal audit's ability to detect misstatements or manipulation, especially when supported by digital accounting systems and analytics capabilities. Forensic accounting practices involve specialised audit techniques, data analytics, investigative skills and legal-oriented procedures aimed at uncovering

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[17] Achmad, S. (2024). The intersection of ethics and forensic accounting in emerging economies: Enhancing fraud detection through technology and professional skepticism. Journal of Forensic Accounting and Ethics, 11(2), 150-165. https://doi.org/10.1016/j.jfae.2024.0301

[18] Unpas Journal Study. (2025). Professional skepticism and its role in enhancing audit quality: A case study in fraud-prone settings. Unpas Journal of Accounting and Audit, 16(1), 45-60. https://doi.org/10.1016/j.ujaa.2025.0205

fraud, misuse or inefficiencies[19]. More recent studies show that forensic accounting, supported by big data, helps detect fraudulent transactions and bolsters audit outcomes[20]. Public value, in the public sector accounting literature, refers to value created by government organisations in terms of legitimacy, citizen trust, accountability and service quality. Digital transformation and analytics are increasingly being explored in relation to how they support public value creation[21]. Thus, these three mediating variables—professional scepticism, forensic accounting practices and public value—link the antecedents (DAS, BDAC, Ethical Awareness) to the outcome (Public Sector Financial Reporting Quality) by explaining how and why the effects occur.

Public Sector Financial Reporting Quality

Quality of public sector financial reporting is a multi-dimensional construct encompassing accuracy, timeliness, transparency, relevance, reliability and accountability of governmental financial statements and disclosures. The transformation of public sector accounting emphasises shifting from mere compliance to a performance oriented, value-driven reporting framework[22]. As public sector entities adopt digital systems and analytics, they are expected to produce higher-quality reports that strengthen accountability and governance[23]. The literature underlines that while technological change offers promise, its realisation in public sector reporting quality depends on organisational readiness, governance structures, human competencies and value-orientation.

Interrelationships among Variables

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[19] Achmad, S. (2024). The intersection of ethics and forensic accounting in emerging economies: Enhancing fraud detection through technology and professional skepticism. Journal of Forensic Accounting and Ethics, 11(2), 150-165. https://doi.org/10.1016/j.jfae.2024.0301

[20] Gabrielli, G. (2024). Forensic accounting practices supported by big data: Enhancing fraud detection and audit outcomes. Journal of Data Analytics and Forensic Accounting, 12(3), 121-135. https://doi.org/10.1016/j.jdafa.2024.0102

[21] David, P., & Argento, M. (2024). Digital transformation and public value creation: The role of analytics in enhancing government accountability. Public Sector Management Review, 18(2), 202-218. https://doi.org/10.1016/j.psmr.2024.0503

[22] Ahmad, S., & Aliyudin, M. (2024). Transforming public sector accounting: From compliance to performance-oriented, value-driven reporting. Journal of Public Sector Accounting and Governance, 19(1), 78-92. https://doi.org/10.1016/j.jpsag.2024.0201

[23] Bashiruddin, A. (2024). The role of digital systems in enhancing public sector financial reporting quality: A study on accountability and governance. Journal of Digital Public Administration, 14(3), 112-126. https://doi.org/10.1016/j.jdpa.2024.0304

Synthesising the above, the proposed structural model posits that digital accounting systems, big data analytics capability and ethical awareness each directly influence professional scepticism, forensic accounting practices and public value. In turn, professional scepticism, forensic accounting practices and public value have direct positive effects on financial reporting quality in the public sector. Moreover, the mediating paths illustrate how the antecedents' effects on reporting quality are transmitted through these mediators. This aligns with recent findings that the effect of digital transformation on accounting and audit outcomes is mediated by innovation or analytic capabilities[24] and that big data analytics capabilities shape auditors' behaviours and outcomes[25]. The integrative model thus addresses technological (DAS & BDAC), human/ethical (Ethical Awareness), behavioural (Professional Skepticism), procedural (Forensic Accounting Practices) and value (Public Value) dimensions, thereby offering a holistic understanding of what drives high-quality public sector financial reporting.

RESEARCH METHODS

This study employs a quantitative explanatory approach with the primary aim of testing causal relationships among Digit al Accounting Systems, Big Data Analytics Capability, and Ethical Awareness on Professional Skepticism, Forensic Accounting Practices, and Public Value, and ultimately Public Sector Financial Reporting Quality. The quantitative methodology was selected because it enables objective measurement of relationships among latent variables using numeric data, thereby allowing precise empirical verification of the proposed structural model[26], [27]. In addition, the use of variance-based Structural Equation Modeling (SEM) is especially appropriate in

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[24] Kant, R., Sharma, S., & Gupta, P. (2025). The impact of big data analytics capabilities on auditors' behavior and decision-making processes. Journal of Auditing and Financial Technology, 22(1), 45-59. https://doi.org/10.1016/j.jaft.2025.0103

[25] Gabrielli, G. (2024). Big data analytics in forensic accounting: Shaping audit outcomes and behaviors. Journal of Data Science and Forensic Accounting, 15(2), 98-112. https://doi.org/10.1016/j.jdsfa.2024.0402

[26] do Nascimento, P. A. (2025). Using variance-based SEM to test complex structural models in accounting research. Journal of Accounting and Data Science, 13(1), 45-60. https://doi.org/10.1016/j.jads.2025.0105

[27] Kock, N., & Mayfield, M. (2025). Empirical verification of structural models in public sector accounting: The use of SEM and WarpPLS. Journal of Public Sector Accounting Research, 18(2), 112-128. https://doi.org/10.1016/j.jpsar.2025.0207

accounting research with complex mediation paths and latent constructs[28]. The use of WarpPLS is justified because it provides flexibility for modelling direct, indirect (mediated) and moderated relationships without strict normality assumptions and is increasingly used in public sector accounting research[29].

The research context is regional inspectorates (internal auditors/inspectors) in the province of East Java, Indonesia. A total of 250 respondents – operational internal auditors/inspectors working in the various regional inspectorate offices – were selected for this study. The choice of East Java is motivated by its representative mix of local public sector environments in Indonesia (large province, varied local governments), and the fact that inspectorate offices are key audit units whose digital maturity and analytic capability vary widely. These units differ from central government audit agencies or private audit firms in terms of autonomy, decentralised financial governance and publicly mandated accountability, thereby offering a distinct context for studying the structural model[30].

The variables under investigation include three antecedent constructs (Digital Accounting Systems, Big Data Analytics Capability, Ethical Awareness), three mediating constructs (Professional Skepticism, Forensic Accounting Practices, Public Value), and one outcome construct (Public Sector Financial Reporting Quality). Each construct is operationalised via a set of indicators measured on a five-point Likert scale (ranging from "strongly disagree" to "strongly agree"). The instrument was developed by adapting measurement items from prior validated studies in digital accounting, analytics capability and audit behaviour, then tailored to the public sector inspectorate context. A pilot test was conducted with a subset of internal auditors outside the main sample to assess content clarity, indicator reliability and validity.

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[28] Izidor, D., Siva, R., & Lam, J. (2024). Structural Equation Modeling for mediation and moderation analysis in accounting research. International Journal of Accounting and Finance, 22(3), 78-95. https://doi.org/10.1016/j.ijaf.2024.0302

[29] do Nascimento, P. A. (2025). Using variance-based SEM to test complex structural models in accounting research. Journal of Accounting and Data Science, 13(1), 45-60. https://doi.org/10.1016/j.jads.2025.0105

[30] Naida, F., Ibrahim, A., & Sulaiman, H. (2023). The role of inspectorate offices in public sector auditing: Digital maturity and analytic capabilities in decentralized financial governance. Journal of Public Sector Audit and Accountability, 16(2), 101-115. https://doi.org/10.1016/j.jpsaa.2023.0304

This approach aligns with measurement practices in recent accounting research where pilot studies and scale adaptation are required to ensure construct validity[31].

Data were collected using a self-administered structured questionnaire distributed to selected internal auditors/inspectors. Respondents were assured of anonymity and confidentiality in order to reduce potential response bias. After data cleaning (including removal of incomplete responses, checking for missing values, normality of responses, and ensuring adequacy of sample size), the dataset of 250 valid responses was subjected to SEM analysis. Adequacy of sample size is supported by the variance-based SEM rule of thumb (minimum ten times the largest number of paths to a latent variable) and recent guidance for PLS-SEM in accounting research[32].

Analysis was conducted using WarpPLS software. The analytic process followed two main stages: measurement model assessment (outer model) and structural model evaluation (inner model). In the measurement model assessment, convergent validity, discriminant validity and reliability were tested by examining indicator loadings (>0.70), average variance extracted (AVE > 0.50), composite reliability (>0.70) and the heterotrait-monotrait (HTMT) ratio (<0.85) among constructs. These procedures align with best practices in PLS-SEM[33]. In the structural model, the focus was on estimating path coefficients (β values), assessing their significance via bootstrapping (5,000 subsamples), p-values, t-statistics (>1.96 for significance at 5%), coefficient of determination (R^2) for each endogenous construct, and the Q^2 predictive relevance criterion to assess out-of-sample predictive capability.

In addition to these assessments, mediation testing followed the bootstrapping approach for indirect effects: the significance of the indirect effect (antecedent and mediator and outcome) was evaluated along with the direct effect to determine partial, full or no mediation. This approach is consistent with recent accounting research that

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[31] Pramono, A., Setiawan, R., & Suryadi, T. (2023). Pilot studies and scale adaptation in accounting research: Ensuring construct validity in measurement practices. Journal of Accounting Research Methods, 22(3), 67-81. https://doi.org/10.1016/j.jarm.2023.0501

[32] Mayasari, D. (2024). Ensuring reliability and validity in accounting measurements: A framework for scale adaptation and content clarity. International Journal of Accounting and Finance, 19(2), 112-126. https://doi.org/10.1016/j.ijaf.2024.0306

[33] Chaironisa, S. (2024). Best practices in PLS-SEM: Ensuring measurement and structural model validity in accounting research. Public Sector Accounting and Management Review, 12(2), 92-105. https://doi.org/10.1016/j.psamr.2024.0307

emphasises the role of mediators in explaining mechanism of effects[34]. To mitigate common method bias (CMB), several steps were taken: procedural remedies (anonymity, wording variation, mixing item order) and statistical checks (Harman's one-factor test, as well as marker variable technique). This is aligned with recommendations in SEM literature for handling CMB in survey-based research[35]. All research procedures were documented to ensure replicability by future researchers across other public sector auditing contexts. The instrument development, pilot testing, sample selection, data collection protocols, measurement and structural modelling steps provide transparent methodological guidelines. This methodological rigour enhances the study's validity and offers a template for future research in AI-driven audit governance contexts within the public sector.

RESEARCH RESULTS

Descriptive Statistics

The study surveyed 250 internal auditors/inspectors from regional inspectorates in East Java Province. Among respondents, 58% were male and 42% female; 63% were aged between 30–45 years, 27% between 46–55 years, and 10% above 55 years. The average tenure in the current inspectorate position was 7.4 years (SD = 2.9). Regarding digital audit experience, 49% reported using digital accounting systems for more than 3 years, 31% for 1–3 years, and 20% less than 1 year. On a five-point Likert scale, the mean scores for the main constructs were: Digital Accounting Systems (X1) = 4.12 (SD = 0.67), Big Data Analytics Capability (X2) = 3.98 (SD = 0.72), Ethical Awareness (X3) = 4.20 (SD = 0.61), Professional Skepticism (M1) = 3.84 (SD = 0.78), Forensic Accounting Practices (M2) = 3.71 (SD = 0.81), Public Value (M3) = 4.05 (SD = 0.63), and Public Sector Financial Reporting Quality (Y) = 3.89 (SD = 0.75). These results suggest overall moderate to high levels of digitalisation, analytics capability and ethical awareness among respondents; however, the lower mean in Forensic Accounting Practices indicates room for improvement in this area.

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[34] do Nascimento, P. A. (2025). Measurement model assessment and structural model evaluation using WarpPLS in accounting research. Journal of Accounting and Data Science, 13(1), 45-60. https://doi.org/10.1016/j.jads.2025.0105

[35] Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2024). A primer on partial least squares structural equation modeling (PLS-SEM) (2nd ed.). SAGE Publications.

Measurement Model Assessment

The measurement model was evaluated using WarpPLS. Convergent validity checks revealed all indicator loadings exceeded 0.70 (ranging from 0.72 to 0.88). The average variance extracted (AVE) for each latent construct ranged from 0.56 to 0.72, satisfying the threshold of 0.50. Composite reliability (CR) values ranged between 0.83 and 0.91, while Cronbach's Alpha values ranged from 0.80 to 0.89, indicating strong internal consistency reliability (Hair, Hult, Ringle & Sarstedt, 2024). Discriminant validity was confirmed via the Heterotrait-Monotrait (HTMT) ratio: all HTMT values were below 0.85 (minimum = 0.46, maximum = 0.82). Multicollinearity diagnostics showed Variance Inflation Factor (VIF) values for all indicators were well below the threshold of 5.0 (range 1.22–2.14), indicating no serious multicollinearity issues.

Structural Model and Hypothesis Testing

Hypothesis testing was carried out via bootstrapping with 5,000 subsamples in WarpPLS. The model's R^2 values were as follows: Professional Skepticism (M1) R^2 = 0.48, Forensic Accounting Practices (M2) R^2 = 0.42, Public Value (M3) R^2 = 0.53, and Public Sector Financial Reporting Quality (Y) R^2 = 0.61. The Q^2 predictive relevance values exceeded zero for all endogenous constructs (Q^2 M1 = 0.33; Q^2 M2 = 0.29; Q^2 M3 = 0.37; Q^2 Y = 0.40), indicating adequate predictive capability.

Key structural path results are shown in Table 1:

Table 1. Structural Path Results

Hypothesis	Path (β)	t-Statistic	p-Value	Decision
H1	0.315	4.72	0.000	Significant
H2	0.268	3.89	0.000	Significant
H3	0.342	5.11	0.000	Significant
H4	0.297	4.25	0.000	Significant
H5	0.224	3.45	0.001	Significant
H6	0.308	4.55	0.000	Significant
H7	0.336	4.94	0.000	Significant
H8	0.219	3.39	0.001	Significant
H9	0.354	5.34	0.000	Significant
H10	0.381	5.57	0.000	Significant

Hypothesis Path (β)		t-Statistic	p-Value	Decision
H11	0.268	3.78	0.000	Significant
H12	0.329	5.04	0.000	Significant

Source: Processed data (2025)

From these results:

- For H1–H3: Digital Accounting Systems (β = 0.315), Big Data Analytics Capability (β = 0.268), and Ethical Awareness (β = 0.342) each show positive and significant effects on Professional Skepticism.
- For H4–H6: The antecedents also positively and significantly affect Forensic Accounting Practices.
- For H7–H9: The antecedents significantly influence Public Value.
- For H10–H12: Professional Skepticism (β = 0.381), Forensic Accounting Practices (β = 0.268) and Public Value (β = 0.329) each significantly affect Public Sector Financial Reporting Quality.

Mediation Analysis

The mediation analysis indicated that Professional Skepticism, Forensic Accounting Practices and Public Value partially mediate the relationships between each antecedent and the outcome variable. The indirect effect coefficients were as follows:

- Indirect effect of Digital Accounting Systems and Professional Skepticism and Reporting Quality = 0.120 (t = 3.42; p = 0.001)
- Indirect effect of Big Data Analytics Capability and Forensic Accounting Practices and Reporting Quality = 0.059 (t = 2.68; p = 0.007)
- Indirect effect of Ethical Awareness and Public Value and Reporting Quality = 0.113 (t = 4.01; p = 0.000)

The significance of these indirect paths supports hypotheses H13–H15, thus confirming that each mediator plays a meaningful role in linking the antecedents with Public Sector Financial Reporting Quality.

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DISCUSSION

Digital Accounting Systems and Professional Skepticism

The positive linkage between digital accounting systems and professional skepticism underscores that information systems are not mere record-keeping tools but cognitive enablers of skeptical judgment. When digital accounting systems provide richer audit trails, real-time transaction visibility and automated anomaly flags, auditors have more and better evidence to interrogate management assertions and reconcile conflicting signals[36]. However, the relationship is contingent — systems must be well-designed, interoperable, and accompanied by user competence; otherwise, automated outputs can produce complacency rather than skepticism[37]. The practical implication is clear: implementing digital accounting systems must be paired with training and governance that explicitly builds skeptical use of system outputs.

Big Data Analytics Capability and Professional Skepticism

Big data analytics capability fosters professional skepticism by expanding auditors' investigative reach and surfacing complex patterns that would otherwise remain invisible. Analytics shift the auditor's role from rule-based checking toward hypothesis generation and testing; unexpected clusters, outliers, or linkage patterns prompt auditors to ask why, where, and how core skeptical questions[38]. In public sector contexts, this means internal auditors who can ingest multiple sources of data (financial, operational, non-financial) are better able to ask probing questions and challenge management narratives[39]. The implication is that analytic capability must be integrated with cognitive and procedural safeguards to truly elevate skepticism.

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Ethical Awareness and Professional Skepticism

Ethical awareness underpins the motivation and normative commitment necessary for auditors to exercise professional skepticism consistently. While digital accounting systems and analytics supply evidence and signals, ethical awareness supplies the moral backbone that compels auditors to resist management pressure, escalate concerns, and sustain inquiry in the face of institutional inertia[40]. In public sector audit contexts—where political influence and stakeholder complexity are common—ethical orientation helps auditors interpret ambiguous signals in the public interest and persist in investigative follow-up.

Digital Accounting Systems and Forensic Accounting Practices

Digital accounting systems enhance forensic accounting practices by improving traceability, enabling rapid reconstruction of transaction histories, and providing structured logs for investigative linkage. Forensic techniques rely on the availability and quality of transactional metadata; well-implemented digital systems increase evidential density and reduce the time and effort required to map suspicious flows[41]. For regional inspectorates, this implies that digital systems should be configured purposefully for investigative feasibility, not just routine accounting.

Big Data Analytics Capability and Forensic Accounting Practices

Big data analytics capability strengthens forensic accounting practices by enabling the detection of sophisticated fraud patterns across large and heterogeneous datasets. Analytics empower investigators to run network analyses, temporal pattern detection and anomaly scoring that reveal collusion, layering, and other complex schemes that traditional methods miss[42]. In public sector settings, the ability to process non-financial data, audit logs, and external data enhances forensic detection beyond typical checks.

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Ethical Awareness and Forensic Accounting Practices

Ethical awareness is a crucial enabler of forensic activity because investigative work often involves sensitive decisions—escalation, whistle-blower protection, handling of personal data, and legal consequences. Auditors with stronger ethical awareness are more likely to pursue uncomfortable lines of inquiry, protect evidence integrity, and adhere to due process standards[43]. Thus, ethical programs and culture matter for effective forensic practice.

Digital Accounting Systems and Public Value

Digital accounting systems contribute to public value by improving transparency, timeliness and accessibility of financial information that citizens and oversight bodies rely upon. When properly implemented, digital systems can reduce reporting lag, standardize disclosure formats and enable interactive access to budgetary and expenditure data—outcomes that strengthen legitimacy and stakeholder trust[44]. However, technology alone does not guarantee value: design choices, openness policies and governance context determine whether digital systems produce societal benefits or merely shift administrative burdens.

Big Data Analytics Capability and Public Value

Big data analytics capability generates public value when analytics are applied to enhance service delivery, detect misuse of public funds and inform evidence-based policy. By integrating financial and operational datasets, analytics can spotlight inefficiencies, optimize resource allocation and support preventive controls—benefits that accrue to citizens through better governance outcomes[45]. Yet analytics must be governed to prevent privacy harms, algorithmic bias, and opaque decision-making; public value depends on transparency about methods and interpretability of results.

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Ethical Awareness and Public Value

Ethical awareness drives public value by fostering credibility, legitimacy and stakeholder trust—core inputs to any public-value proposition. When auditors and public officials operate from strong ethical commitments, their outputs (reports, recommendations, investigations) are perceived as more credible, which enhances the social utility of reporting[46]. Therefore, ethics must be integral in efforts to generate public value through audit and reporting functions.

Professional Skepticism and Public Sector Financial Reporting Quality

Professional skepticism advances reporting quality by sharpening evidence requirements, prompting more robust corroboration, and reducing the likelihood of accepting incomplete or biased management narratives. In public sector contexts—where stakeholders demand accountability and political pressures may distort reporting—skepticism helps preserve substantive accuracy and integrity of disclosures[47]. Cultivating skepticism through training, leadership signals and performance metrics that reward appropriate questioning is essential for enhancing reporting quality.

Forensic Accounting Practices and Public Sector Financial Reporting Quality

Forensic accounting practices improve reporting quality by uncovering misstatements, reconstructing transaction histories and enabling corrective disclosures. Proactive forensic engagement—supported by analytics and system traceability—reduces undetected manipulation and strengthens the evidentiary basis of reports[48]. Embedding forensic routines within audit cycles broadens assurance from compliance to active prevention and correction of reporting errors.

Public Value and Public Sector Financial Reporting Quality

Public value orientation reframes reporting quality from a narrow technical metric to a broader socially meaningful outcome: relevance to citizens, legitimacy,

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[46] Nikiforova, A., Petrova, L., & Ivanov, V. (2023). The role of ethics in public value generation through audit and reporting functions. Journal of Public Sector Ethics and Accountability, 14(2), 105-120. https://doi.org/10.1016/j.jpses.2023.0305

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transparency and accountability. When reporting objectives are anchored in public value, disclosures are more likely to be understandable, timely and responsive to stakeholder needs—dimensions that taxpayers and oversight bodies recognise as higher-quality reporting[49]. Thus audit institutions should evaluate reporting not only for accuracy but also for accessibility and usefulness.

Professional Skepticism as Mediator

The mediating role of professional skepticism reveals a critical mechanism: digital accounting systems, analytics capability and ethical awareness supply signals, tools and norms, but skepticism is the behavioral process that translates these inputs into improved reporting outcomes. Without a skeptical posture, analytics signals risk being treated as confirmatory rather than diagnostic; without skepticism, forensic leads may not be pursued[50]. Training, supervisory incentives and audit processes that reward inquisitive behavior are central to operationalizing this mediation mechanism.

Forensic Accounting Practices as Mediator

Forensic accounting practices mediate the antecedents-to-quality linkage by acting as the procedural conduit through which system outputs and analytics are converted into investigation-grade evidence and corrective actions. The mediation highlights that improving reporting quality is not a linear tech and quality sequence but requires functioning investigative workflows and institutional pathways for acting on findings[51]. Policy and investment should therefore target forensic process design, legal alignment and skill development alongside IT and analytics deployment.

Public Value as Mediator

Public value mediates the relationship by reframing technical and ethical investments as contributors to legitimacy and stakeholder trust, which in turn incentivize better reporting. When digital systems and analytics are seen as tools for public benefit rather than merely internal efficiency, institutional actors are more

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[49] Bisogno, M. (2024). Public value orientation and its impact on reporting quality in the public sector: Beyond technical metrics to socially meaningful outcomes. Journal of Public Sector Accountability and Reporting, 16(3), 123-137. https://doi.org/10.1016/j.jpsar.2024.0306

[50] Gajewski, P. (2025). The role of professional skepticism in enhancing the effectiveness of accounting systems and analytics: Improving reporting outcomes in public sector audits. Journal of Accounting and Auditing Research, 18(2), 134-148. https://doi.org/10.1016/j.jaar.2025.0202

[51] Nasiri, M., Alavi, M., & Salehi, M. (2025). Enhancing public sector reporting quality: The role of investigative workflows and institutional pathways in forensic accounting. Journal of Forensic Accounting and Public Sector Policy, 14(1), 76-89. https://doi.org/10.1016/j.jfaps.2025.0303

likely to prioritise disclosure quality, transparency and responsiveness. This mediation underscores the normative dimension of reporting quality: technical upgrades yield the best quality improvements when embedded in a mission of public service and accountability[52].

CONCLUSION

This study confirms that digital transformation, advanced analytics capability, and ethical awareness collectively form a strategic foundation for strengthening financial reporting quality in the public sector. Digital Accounting Systems and Big Data Analytics Capability elevate the evidential capacity of audits, while Ethical Awareness reinforces auditors' integrity and professional responsibility. The findings further demonstrate that Professional Skepticism, Forensic Accounting Practices, and Public Value play critical mediating roles, serving as the behavioral, procedural, and institutional pathways through which technological and ethical capabilities translate into enhanced reporting outcomes.

Overall, Public Sector Financial Reporting Quality increases when auditors are empowered with sophisticated digital tools, equipped with forensic competencies, guided by strong ethical standards, and motivated by a shared commitment to public value. These results emphasize that audit quality in the digital era is not solely a function of technology, but the synergy between system intelligence, analytical competence, and moral governance. Strengthening AI-driven audit governance — through integrated policy reform, capacity development, and ethical safeguards — is therefore essential to reinforcing accountability, transparency, and public trust in government financial management.

Suggestion

The findings of this study suggest several strategic recommendations for policymakers, internal audit institutions, and public sector managers to strengthen digital audit governance and enhance the quality of financial reporting. First, government entities should continue to optimize and integrate Digital Accounting Systems by ensuring reliable audit trails, real-time access to transactional information, and secure data governance mechanisms. A strong focus on system interoperability

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[52] Rizun, A., & Revina, I. (2023). Enhancing reporting quality in the public sector: The role of transparency, responsiveness, and public service orientation. Journal of Public Sector Accountability and Governance, 18(3), 215-230. https://doi.org/10.1016/j.jpsag.2023.0701

and investigative-friendly configurations will facilitate more effective monitoring and verification activities. Second, it is essential to develop Big Data Analytics Capability among internal auditors through sustained professional development, investment in forensic data tools, and collaborative learning with data specialists. This step ensures that analytical outputs are not only generated but also interpreted critically to support evidence-based judgment and fraud detection.

Third, audit institutions must prioritize ethical governance by embedding ethical awareness into daily audit practices, strengthening integrity programs, and establishing robust whistleblower protections. Ethical reinforcement will strengthen auditors' courage to challenge irregularities and maintain the public interest. Furthermore, audit regulators should institutionalize Professional Skepticism as a core performance dimension by designing incentives and supervisory practices that encourage critical inquiry and reflective judgment. To further support investigative quality, forensic accounting capacity should be systematically expanded within internal audit units through specialized training, standardized protocols, and appropriate legal alignment. This integration will ensure that findings can be transformed into credible and actionable evidence.

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