Determinants of Auditors' Fraud Detection Ability in the Digital Audit Environment: A Systematic Review of Individual, Professional, Organizational, and Technological Evidence

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ABSTRACT

Fraud detection remains a core but contested responsibility in auditing because contemporary fraud schemes increasingly combine managerial concealment, complex transactions, weak governance, and digital evidence trails. This systematic literature review synthesizes evidence on the determinants of auditors' fraud detection ability in the digital audit environment. Using a Scopus export containing 113 records and a structured screening process, the review retained 50 unique studies for thematic synthesis across four determinant domains. The evidence shows that fraud detection ability is shaped by individual-cognitive determinants such as experience, professional skepticism, red flag awareness, self-efficacy, personality traits, motivation, and time pressure; professional-ethical and forensic determinants such as competence, ethics, integrity, forensic accounting skills, professional training, management integrity assessment, and computer-assisted audit expertise; organizational-governance determinants such as tone at the top, internal audit quality, risk management, public procurement governance, corporate governance, whistleblowing, and sector-specific audit context; and technological-analytical determinants such as electronic auditing, big data analytics, artificial intelligence, machine learning, process analytics, and full-population audit testing. The review further shows that digital tools expand the scale and speed of detection but do not replace professional judgment. Instead, technology becomes effective when auditors possess the skepticism, forensic reasoning, ethical discipline, and organizational authority needed to interpret anomalies and convert risk signals into audit action. The study contributes an integrated four-domain framework for explaining auditors' fraud detection ability and offers directions for audit education, professional training, digital audit policy, and future research on socio-technical fraud detection systems.

Keywords: big data analytics; electronic auditing; forensic accounting; fraud detection ability; professional skepticism

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INTRODUCTION

Fraud detection remains a central yet complex responsibility of auditors because it extends beyond verifying financial statements to identifying intentional misstatements, corruption, asset misappropriation, procurement fraud, and other forms of financial misconduct. Prior studies indicate that fraud detection is a multidimensional capability influenced by auditors' experience, ethics, professional skepticism, personality, red flag awareness, and self-efficacy (Wahidahwati & Asyik, 2022; Ramadhany et al., 2025). These findings suggest that fraud detection depends on the interaction of technical knowledge, professional judgment, motivation, ethical orientation, and behavioral attributes.

The digitalization of auditing has increased the complexity of fraud detection by expanding the volume, variety, and speed of audit evidence. Digital transactions, enterprise systems, remote evidence, and large-scale datasets require auditors to assess increasingly sophisticated information. Electronic auditing can enhance fraud detection when supported by ethical awareness and forensic accounting competence, while big data analytics can improve anomaly detection, reduce false positives, support real-time monitoring, and strengthen fraud risk identification (Al-Zoubi & Al-Taha, 2025; Shalhoob et al., 2024; Tang & Karim, 2019). Nevertheless, technology complements rather than replaces auditors' professional judgment.

Fraud detection is also shaped by organizational and contextual conditions. Competence, whistleblowing mechanisms, probity audits, emotional intelligence, internal audit effectiveness, professional responsibility, training, and industry-specific knowledge have been identified as important determinants of fraud detection performance (Syamsuddin et al., 2023; Nguyen et al., 2024; Hansen et al., 2025). This evidence indicates that individual auditor capability must be reinforced by effective governance systems, organizational support, and contextual expertise.

Recent research further emphasizes the role of forensic accounting and digital analytics. Forensic simulation can strengthen technical competence and ethical judgment, while the integration of forensic accounting with big data technologies may improve the prevention and detection of internal fraud (Polo et al., 2025; Akinbowale et al., 2023). However, the literature remains fragmented because studies often examine individual, professional, ethical, organizational, forensic, and technological factors separately. Auditors may also lack adequate guidance for assessing management integrity, and professional skepticism may vary across cultural and linguistic settings (Kassem, 2018; Awadallah & Saadullah, 2024).

Accordingly, this systematic literature review synthesizes the determinants of auditors' fraud detection ability in digital audit environments. It examines how individual, professional, organizational, and technological factors influence fraud detection and how traditional audit capabilities interact with emerging technologies. The review proposes an integrated framework comprising four domains: individual-cognitive, professional-ethical and forensic, organizational-governance, and technological-analytical. By conceptualizing fraud detection as a socio-technical capability, this review contributes to theory development and provides practical implications for audit firms, regulators, public institutions, educators, and professional bodies.

HYPOTHESIS DEVELOPMENT

Theoretical Foundations of Fraud Detection Ability

Fraud detection ability is explained by agency theory, where information asymmetry and conflicting interests between principals and agents create opportunities for fraud (Jensen

& Meckling, 1976). Auditors reduce this risk by evaluating financial reporting integrity, fraud incentives, opportunities, rationalization, and governance weaknesses.

Fraud theories further explain fraudulent behavior through the fraud triangle (Cressey, 1953), fraud diamond (Wolfe & Hermanson, 2004), and fraud pentagon (Vousinas, 2019), which emphasize behavioral and organizational factors. However, auditors still face challenges in assessing fraud motives and indicators, requiring strong professional judgment (Kassem, 2022, 2024).

Professional skepticism enables auditors to interpret fraud indicators effectively. Hurtt (2010) identifies skepticism dimensions that influence audit judgment, while Hurtt et al. (2013), Olsen and Gold (2018), and Brasel et al. (2019) highlight its role in evidence evaluation and fraud assessment. Therefore, effective fraud detection depends on auditor skepticism and appropriate audit conditions.

Evolution from Traditional Audit Judgment to Digital Fraud Detection

Traditionally, fraud detection relied on auditors' judgment, experience, analytical procedures, interviews, and evidence examination. The integration of forensic accounting expertise has strengthened fraud investigations, particularly in complex engagements (Asare & Wright, 2018; Fadilah et al., 2019).

Digital technologies such as electronic auditing, CAATs, big data analytics, artificial intelligence, and machine learning have expanded audit evidence and improved fraud identification through data-driven approaches (Al-Zoubi & Al-Taha, 2025; Chen et al., 2022; Li et al., 2024). However, technology alone is insufficient, as AI-generated insights still require auditors' ethical judgment, expertise, and professional skepticism (Shalhoob et al., 2024; Al Shammakhi et al., 2025). Therefore, fraud detection represents a socio-technical process combining technological capabilities with human judgment.

Debates and Controversies in Technology-Enabled Fraud Detection

Several debates continue to shape the fraud detection literature. The first concerns whether technology replaces or complements human judgment. Current evidence supports the complementary view, showing that big data analytics and artificial intelligence improve detection efficiency, speed, and pattern recognition, while ethical judgment and professional responsibility remain the domain of auditors.

A second debate relates to professional skepticism. Awadallah and Saadullah (2024) demonstrate that skepticism is measured differently across cultural and linguistic contexts, whereas Verwey and Asare (2022) show that ethical idealism and trait skepticism jointly enhance fraud detection. These findings indicate that professional skepticism is both a measurable individual characteristic and a context-dependent professional behavior.

A third debate focuses on the roles of experience and work pressure. Rahim et al. (2023) and Hakami et al. (2020) find that audit experience improves fraud detection, whereas Balboula and Elfar (2024), Al-Sendy et al. (2024), and Khairunnisa et al. (2025) show that time pressure, workload, and personality traits may weaken this relationship. Another debate concerns fraud red flags, which help direct auditors' attention but require professional skepticism, analytical procedures, and contextual understanding to avoid false positives. Finally, ethical issues surrounding data quality, privacy, explainability, and accountability remain central to AI-enabled fraud detection. Overall, the literature suggests that fraud detection ability is best explained through the integration of human cognition, professional ethics, governance, and digital analytics.

METHOD, DATA AND ANALYSIS

Search Strategy

This study employed a systematic literature review (SLR) approach based on the transparency principles of PRISMA 2020. According to Page et al. (2021), systematic reviews should clearly report the rationale, procedures, and findings of the review process. Consistent with the classifications of Grant and Booth (2009) and the methodological guidance of Higgins et al. (2024), this review was designed as an empirical-synthesis SLR using explicit search terms, eligibility criteria, data extraction procedures, and thematic synthesis.

Scopus was selected as the primary database because of its extensive coverage of peer-reviewed research in auditing, accounting, forensic accounting, governance, and information systems. The search combined keywords related to fraud detection outcomes, audit and forensic professions, individual and professional determinants, and digital technology factors. Searches were conducted in titles, abstracts, and keywords, resulting in 113 Scopus-indexed records retrieved on 21 May 2026.

Eligibility Criteria

Studies were included if they examined fraud detection, fraud detection ability, fraud risk assessment, financial statement fraud detection, or forensic accounting detection within auditing and accounting contexts. Eligible participants included internal auditors, external auditors, forensic auditors, forensic accountants, accountants, and other audit-related professionals. Studies were also required to investigate at least one determinant of fraud detection capability, including individual-cognitive, professional-ethical, organizational-governance, or technological-analytical factors.

Studies focusing on cybercrime, consumer fraud, criminal law issues, or non-audit-related fraud were excluded. Editorials, opinion articles, newspaper publications, and records lacking adequate metadata or abstracts were also omitted. Following the recommendations of Peters et al. (2024) and Tricco et al. (2018), conceptual, methodological, review, and empirical studies were retained when they contributed directly to the fraud detection determinant framework.

Screening, Selection, and Quality Assessment

The screening process began with 113 records. Titles, abstracts, and keywords were reviewed to assess their relevance to audit-related fraud detection. After applying the eligibility criteria, 50 unique studies were retained for thematic synthesis and categorized into four analytical tables, as summarized in Figure 1.

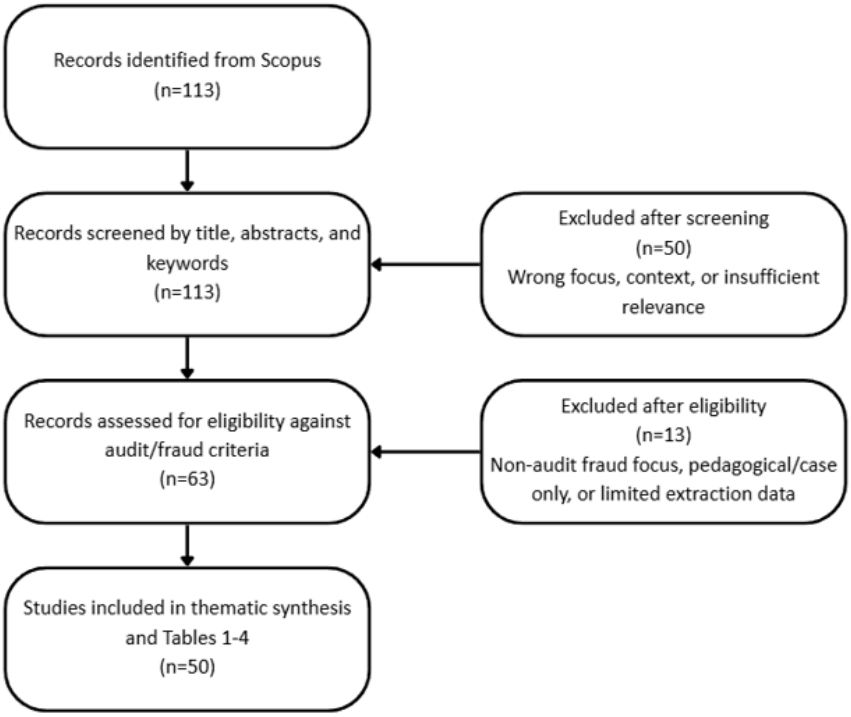

Figure 1. PRISMA flow diagram illustrating the screening and selection process.

Quality appraisal evaluated research objectives, relevance to fraud detection, methodological suitability, measurement validity, sample and contextual adequacy, analytical transparency, and theoretical foundation. Rather than serving as a basis for exclusion, the assessment informed the synthesis process due to the methodological diversity of the field. For example, Wahidahwati and Asyik (2022) applied multiple regression analysis, Al-Zoubi and Al-Taha (2025) employed factor analysis, Cronbach's alpha, and SmartPLS, Syamsuddin et al. (2023) used moderated regression analysis, and Benligiray et al. (2025) integrated expert judgments, financial statement data, and regulatory fraud notifications. This methodological variation was treated as an important characteristic of the literature rather than a limitation.

RESULT

Individual-Cognitive Determinants of Auditors' Fraud Detection Ability

Table 1 synthesizes twelve studies on the individual-cognitive determinants of auditors' fraud detection ability. Professional skepticism emerges as the most consistent factor, functioning as a direct determinant, mediating mechanism, or enabling condition in fraud detection (Wahidahwati & Asyik, 2022; Ramadhany et al., 2025; Rahim et al., 2023; Johari et al., 2022; Nouraldeen, 2026; Verwey & Asare, 2022; Khairunnisa et al., 2025). These findings indicate that skepticism helps auditors translate red flags, experience, and professional knowledge into critical judgments.

Experience also contributes to fraud detection, although its effect is not automatic. Rahim et al. (2023), Al-Sendy et al. (2024), and Wahidahwati and Asyik (2022) report positive effects, whereas Brasel et al. (2019) and Khairunnisa et al. (2025) show that task design, workload, and time pressure determine whether experience develops into skeptical action.

Self-efficacy and motivation further influence auditors' willingness to perform complex detection procedures (Ramadhany et al., 2025; Amlayasa et al., 2025; Rustiarini et al., 2020). In addition, personality and ethical traits affect how auditors respond to uncertainty, pressure, and ethical cues (Balboula & Elfar, 2024; Nouraldeen, 2026; Al-Sendy et al., 2024; Verwey & Asare, 2022). Overall, fraud detection ability is shaped by the interaction of skepticism, experience, confidence, motivation, personality, and professional ethics.

Table 1. Essential summary of findings on individual-cognitive determinants of auditors' fraud detection ability

References	Context	Determinant / Tool	Method	Key finding	Implication
Wahidahwati and Asyik (2022)	Regional supreme audit board auditors	Experience, ethics, professional skepticism, personality type	Quantitative survey; multiple regression	All determinants positively and significantly influenced fraud detection ability.	Fraud detection depends on accumulated exposure, ethical orientation, skepticism, and stable judgment traits.
Ramadhany et al. (2025)	Internal auditors in Indonesian commercial banks	Red flag awareness, self-efficacy, professional skepticism	Quantitative survey; SmartPLS	Red flag awareness and self-efficacy affected detection directly and through skepticism.	Training should combine fraud indicators, confidence building, and skeptical reasoning.
Balboula and Elfar (2024)	Auditors in Egypt	Perfectionism type and time budget pressure	Empirical study with moderation	Perfectionism shaped fraud detection ability, while time pressure moderated its effect.	Careful judgment helps detection, but excessive time pressure can weaken diligence.
Rahim et al. (2023)	Financial statement audit context	Auditor experience, professional scepticism, idealism	SEM-based empirical study	Experience contributed to fraud detection through scepticism and idealism.	Experience must be converted into ethical and skeptical interpretation, not routine familiarity.

References	Context	Determinant / Tool	Method	Key finding	Implication
Johari et al. (2022)	Auditors in Malaysia	Competence, locus of control, fraud risk assessment, trust	Empirical survey	Professional scepticism was shaped by competence and individual-control beliefs.	Scepticism development requires both technical competence and psychological readiness.
Nouraldeen (2026)	Audit and accounting professionals	Psychological traits, ethics, skepticism	Empirical behavioral study	Psychological traits and ethics differentiated fraud detection outcomes.	Ethical orientation and skeptical disposition operate as cognitive filters.
Amlayasa et al. (2025)	Auditors' responsibility context	Intrinsic motivation and self-efficacy	Empirical quantitative study	Intrinsic motivation supported self-efficacy for fraud detection.	Motivated auditors are more likely to persist in complex detection tasks.
Al-Sendy et al. (2024)	Public accounting offices in Kurdistan	Experience, workload, red flags, personality type	Empirical survey	Experience, workload, red flags, and personality type influenced detection ability.	Detection capability depends on cognitive readiness and manageable task conditions.
Brasel et al. (2019)	Fraud risk assessment and inquiry timing	Assessment frequency, inquiry timing, skeptical judgment/action	Experimental audit study	Fraud risk assessment design affected auditors' skeptical judgments and actions.	Procedural timing can strengthen or weaken the conversion of suspicion into action.

References	Context	Determinant / Tool	Method	Key finding	Implication
Rustiarini et al. (2020)	Public accounting profession	Goal orientation, self-efficacy, responsibility	Empirical survey	Fraud detection responsibility was linked to professional orientation and efficacy.	Responsibility beliefs influence whether auditors accept and act on detection duties.
Verwey and Asare (2022)	Audit planning and fraud detection	Ethical idealism and trait skepticism	Experimental behavioral study	Ethical idealism and trait skepticism jointly affected fraud detection judgments.	Ethics and skepticism should be cultivated as complementary capacities.
Khairunnisa et al. (2025)	Auditors under pressure	Workload, time pressure, professional skepticism, competence	Empirical quantitative study	Workload, time pressure, skepticism, and competence affected detection ability.	Audit pressure may suppress the benefits of competence and skeptical evaluation.

Professional-Ethical and Forensic Competence Determinants

Table 2 indicates that professional competence, ethics, integrity, and forensic capability are central determinants of auditors' fraud detection ability. Syamsuddin et al. (2023) demonstrate that competence, whistleblowing, and probity audits affect fraud detection in procurement, whereas Kassem (2018) highlights the challenges involved in evaluating management integrity. These findings confirm that fraud detection is closely associated with ethical judgment and professional accountability. Consistently, Riadi et al. (2025), Tbayshat et al. (2024), and Nouraldeen (2025) link audit quality, competence, empowerment, independence, and professional skepticism to stronger detection performance.

Forensic accounting further broadens conventional audit competence. Asare and Wright (2018), Luka et al. (2025), Fadilah et al. (2019), and Khomsiyah et al. (2019) show that forensic consultation, forensic knowledge, computer-assisted audit techniques, communication skills, and professional skepticism enhance fraud detection. Nurleni et al. (2024) further identify training, integrity, and skepticism as important factors in strengthening government internal control. Chariri and Nuraisya (2025) emphasize the cultural dimensions of audit procedures, experience, and responsibility, while Nazri et al. (2023) confirm the role of skepticism among Malaysian non-Big 4 auditors. Overall, professional-ethical and forensic competencies enable auditors to transform technical knowledge into responsible and effective fraud detection actions.

Table 2. Essential summary of findings on professional-ethical and forensic competence determinants

References	Context	Determinant / Tool	Method	Key finding	Implication
Syamsuddin et al. (2023)	Public procurement audit	Competence, whistleblowing, probity audit, emotional intelligence	Correlational study; moderated regression	Competence, whistleblowing, and probity audit affected fraud detection; emotional intelligence moderated the relationships.	Procurement fraud detection requires competence, reporting mechanisms, and emotional control.
Kassem (2018)	Big 4 external auditors in Egypt	Management integrity assessment	Interview-based insights	Auditors lacked clear guidance on assessing management integrity.	Integrity assessment should be structured within fraud risk procedures.
Asare and Wright (2018)	Forensic specialist consultation	Forensic consultation and specialist expertise	Field evidence	Forensic consultation shaped auditors' fraud detection experience.	Specialist knowledge can extend auditors' capability in complex fraud cases.
Luka et al. (2025)	Public-sector fraud detection	Forensic accounting knowledge and big data analytics skills	PLS-SEM	Big data analytics skills mediated the link between forensic knowledge and detection performance.	Forensic knowledge becomes more powerful when paired with analytical skill.
Nurleni et al. (2024)	Government internal control mechanisms	Training, professional skepticism, integrity	Empirical study	Auditor training, skepticism, and integrity enhanced fraud detection capacities.	Professional development should integrate ethics, skepticism, and applied training.

References	Context	Determinant / Tool	Method	Key finding	Implication
Riadi et al. (2025)	Audit quality and detection capability	Audit quality, competence, ethical principles, professionalism	Empirical study	Audit quality shaped auditors' detection capabilities.	High-quality audit systems reinforce professional determinants of detection.
Fadilah et al. (2019)	External auditors	Forensic accounting fraud detection skills	Empirical study	Forensic accounting skills were relevant to external auditors' fraud detection.	Fraud-oriented training should extend beyond traditional audit procedures.
Chariri and Nuraisya (2025)	Javanese audit culture context	Audit procedures, experience, responsibility	Cultural perspective study	Audit procedures, experience, and responsibility shaped detection in a cultural context.	Professional determinants must be interpreted with cultural and accountability norms.
Nazri et al. (2023)	Malaysian non-Big 4 auditors	Professional skepticism dimensions	Empirical study using Hurtt-related dimensions	Professional skepticism influenced fraud detection among non-Big 4 auditors.	Skeptical attributes should be embedded in professional development.
Tbayshat et al. (2024)	Jordanian public sector	Auditor competency and job empowerment	Paired comparison/public-sector study	Competency and empowerment shaped fraud risk assessment.	Empowered competent auditors are better positioned to evaluate fraud risk.

References	Context	Determinant / Tool	Method	Key finding	Implication
Khomsiyah et al. (2019)	Auditor ability context	Communication skill, CAATs, professional scepticism	Empirical study	Communication skill, CAATs, and professional scepticism affected fraud detection.	Professional competence now includes interpersonal and computer-assisted capabilities.
Nouraldeen (2025)	Lebanon auditor attributes context	Competence, independence, professional skepticism	Empirical study	Competent and independent auditors may still fail if skepticism is insufficient.	Skepticism converts professional attributes into fraud detection behavior.

Organizational-Governance and Contextual Determinants

Table 3 shows that auditors' fraud detection ability is shaped by governance systems, organizational climate, audit authority, and sectoral complexity. Hansen et al. (2025) demonstrate that fraud in the construction sector requires an influence factor model because project complexity and financial statement manipulation generate distinctive detection risks. Similarly, Thakkar et al. (2025), Dewi et al. (2024), and Hassan et al. (2025) identify data analytics, big data competence, tone at the top, corporate governance, and information technology as important factors in fraud detection and prevention. These findings indicate that individual competence becomes effective when organizational conditions provide adequate access to evidence and support accurate risk interpretation.

Governance factors are particularly important in the public sector. Yanuarisa et al. (2025) examine internal audit within public procurement governance, while Harahap and Erlina (2024) show that risk management and risk-based internal auditing strengthen fraud detection in local government. Nguyen et al. (2024) further find that internal audit quality, independence, capability, leadership support, responsibility, and training influence detection performance in an emerging economy. Bari et al. (2024), Julian et al. (2021), Hariyani et al. (2024), and Kassem (2024) also emphasize corruption control, tone at the top, internal auditor quality, and structured fraud-factor assessment. However, Kassem (2022) notes that fraud rationalization remains difficult to evaluate, highlighting the need for governance information that extends beyond quantitative financial data.

Table 3. Essential summary of findings on organizational-governance and contextual determinants

References	ntext	Determinant / Tool	Method	Key finding	Implication
Hansen et al. (2025)	Construction companies' financial statements	Industry-specific fraud factors	Literature review, factor analysis, focus group validation	A construction-specific influence factor model was developed.	Sector complexity requires contextual fraud detection knowledge.
Thakkar et al. (2025)	Zimbabwean listed companies	Data analytic tool integration in internal audit	Empirical study	Data analytic tools optimized internal audit practices against occupational fraud.	Technology adoption depends on organizational internal audit readiness.
Dewi et al. (2024)	Internal auditors and financial reports	Big data competencies and tone at the top	Empirical quantitative study	Big data competence and tone at the top influenced internal auditor effectiveness	Governance climate conditions the value of analytical competence.
Kassem (2024)	External auditors assessing FFRR	Fraud factors and audit policy	Empirical study	Auditors' use of fraud factors has implications for policy and practice.	Structured risk-factor use strengthens governance-oriented fraud assessment.
Kassem (2022)	External audit fraud rationalizatio n	Rationalizatio n assessment	Conceptual/empiri cal audit policy study	External auditors face difficulty assessing rationalizatio n of fraud.	Governance assessment must include motives and rationalization cues.
Bari et al. (2024)	Board and internal audit setting	Internal auditing, corruption control, corporate governance	Board-perspective study	Internal auditing contributes to corruption control and governance enhancemen t	Detection requires governance authority and ethical oversight.

References	ntext	Determinant / Tool	Method	Key finding	Implication
Yanuarisa et al. (2025)	Public procurement governance	Internal audit of public procurement	Systematic literature review	Internal audit is central to public procurement governance.	Procurement contexts require probity, accountability, and process controls.
Julian et al. (2021)	Internal auditors in Indonesia	Tone at the top and skepticism	Empirical judgment study	Tone at the top and professional skepticism affected fraud risk judgment.	Ethical climate shapes how auditors evaluate and act on fraud risk.
Hassan et al. (2025)	Accountants and auditors	Corporate governance and information technology	Perception-based empirical study	Governance and IT were perceived as important for fraud detection and prevention.	Organizational governance and digital infrastructure are complementary.
Nguyen et al. (2024)	Joint stock firms in Vietnam	Internal audit quality, capability, independence, leadership support	Survey; SPSS and SmartPLS	Internal audit effectiveness ,responsibility,and training affected fraud detection.	Organizational support converts auditor capability into detection performance.
Hariyani et al. (2024)	Internal auditors' quality	Internal control, professional commitment, auditor quality	SEM	Internal auditor quality influenced fraud detection determinants	Control environment and commitment affect detection capacity.
Harahap and Erlina (2024)	Local governments	Risk management and risk-based internal audit	Empirical study	Risk management and risk-based internal audit affected fraud detection.	Detection improves when audit work is embedded in risk governance.

Technology-Enabled Fraud Detection Determinants

Table 4 synthesizes fifteen studies examining technology-enabled fraud detection. Electronic auditing, big data analytics, machine learning, artificial intelligence, text analytics, and full-population auditing enhance auditors' ability to identify anomalies and suspicious patterns (Al-Zoubi & Al-Taha, 2025; Shalhoob et al., 2024; Dewi et al., 2024; Hidayat & Lindrianasari, 2025; Alharasis, 2026; Prolhac & Gaie, 2023; Alam & Ahmad, 2023; Sembiring & Widuri, 2023; Sánchez & Urquiza, 2024; Altawalbeh et al., 2025; Al Shammakhi et al., 2025; Akinbowale et al., 2023; Thuy, 2026; Chen et al., 2022; Li et al., 2024).

However, technological capability alone is insufficient. Al-Zoubi and Al-Taha (2025) show that electronic auditing is more effective when supported by forensic competence and ethical principles. Shalhoob et al. (2024) emphasize data quality, privacy, internal control integration, ethics, and human experience, while Al Shammakhi et al. (2025) highlight the importance of explainability. Akinbowale et al. (2023) further integrate forensic accounting with big data technology in banking fraud mitigation. Overall, the evidence supports an augmentation model in which technology expands audit coverage and detects anomalies, while auditors remain responsible for interpreting intent, reliability, materiality, and evidential sufficiency.

Table 4. Essential summary of findings on technological-analytical determinants of fraud detection ability

References	Context	Determinant / Tool	Method	Key finding	Implication
Al-Zoubi and Al-Taha (2025)	External statutory auditors	Electronic auditing with ethics and forensic skills	Survey; factor analysis; SmartPLS	Electronic auditing improved fraud detection when supported by ethics and forensic skills.	Digital audit tools require professional and forensic moderation.
Shalhoob et al. (2024)	Accounting processes	Big data analytics	Desk study/review	BDA improves anomaly identification, false-positive reduction, and real-time monitoring.	Human expertise remains necessary for ethics and interpretation.
Dewi et al. (2024)	Internal audit effectiveness	Big data competencies	Empirical quantitative study	Big data competencies strengthened fraud detection effectiveness.	Analytical literacy is becoming part of internal audit capability.

References	Context	Determinant / Tool	Method	Key finding	Implication
Hidayat and Lindrianasari (2025)	Financial audit	Artificial intelligence	Empirical/conceptual study	AI supported proactive mitigation of audit negligence and fraud risk.	AI can improve audit efficiency but requires oversight.
Alharasis (2026)	Jordanian SMEs	Digital competence and metaverse utilization	Empirical mediation study	Digital competence strengthened internal audit capabilities through technology use.	Emerging technologies require capability-building before audit value appears.
Prolhac and Gaie (2023)	Tax fraud detection	Open AI/e-government framework	Framework development	An open framework facilitated tax fraud detection.	Digital detection can be supported by interoperable public data systems.
Alam and Ahmad (2023)	Public financial management system	HGRO feature selection and OC-LSTM	Intelligent fraud detection framework	Feature selection and neural modeling supported fraud detection.	Advanced analytics can classify complex transaction patterns.
Sembiring and Widuri (2023)	Auditor experience and big data	Big data and forensic audit mediation	Empirical study	Big data and forensic audit mediated the effect of experience on fraud detection.	Experience is amplified when translated into data-driven forensic procedures.
Sánchez and Urquiza (2024)	Text-based fraud detection	Semi-supervised topic modeling and keyword integration	Computational method	Topic modeling and keyword integration improved fraud detection.	Text analytics can expand fraud evidence beyond numerical data.

References	Context	Determinant / Tool	Method	Key finding	Implication
Altawalbeh et al. (2025)	Accounting and financial control	Artificial intelligence	Conceptual/empirical assessment	AI has dual effects on accounting automation, financial control, and fraud detection.	AI adoption must balance efficiency with control and accountability.
Al Shammakhi et al. (2025)	Fraud risk assessment	Explainable AI/ML and throughput model	Exploratory empirical framework	Explainable AI/ML can be framed through a cognitive-behavioral model.	Explainability is needed for auditors to trust and justify analytics.
Akinbowale et al. (2023)	Banking industry	Forensic accounting and big data technology	Conceptual framework	Integration of forensic accounting and big data supports internal fraud mitigation.	Banking fraud detection needs socio-technical architecture.
Thuy (2026)	Technology-driven fraud detection	Structural analytical framework	PLS/modelling framework	Technology-driven fraud detection was linked to audit outcomes.	Technology should be studied as part of audit performance systems.
Chen et al. (2022)	Full population auditing	Machine learning	Methodological model	Machine learning enabled full-population audit analytics.	Population-level testing can reduce sampling limitations in detection.
Li et al. (2024)	Financial statement fraud	Machine learning and key financial indicators	ML approach with real-world applications	Key indicators and ML models uncovered financial statement fraud.	Predictive analytics can prioritize suspicious firms for auditor attention.

DISCUSSION

The literature indicates that auditors' fraud detection ability is an integrated capability rather than merely a technical skill. Individual factors such as professional skepticism, experience, red flag awareness, self-efficacy, motivation, ethical idealism, and personality influence auditors' ability to recognize fraud. However, effective detection also depends on professional competence, integrity, forensic accounting knowledge, audit procedures, and

specialist consultation to transform suspicion into reliable evidence (Wahidahwati & Asyik, 2022; Ramadhany et al., 2025; Kassem, 2018; Luka et al., 2025).

The review also identifies a judgment–action gap. Auditors may recognize fraud indicators but fail to pursue further evidence because of time pressure, workload, governance weaknesses, or organizational constraints. Brasel et al. (2019), Khairunnisa et al. (2025), Nguyen et al. (2024), and Hariyani et al. (2024) suggest that fraud detection depends not only on auditors' judgment but also on organizational support, authority, and effective audit systems.

The findings further indicate that fraud detection capabilities vary across sectors. Procurement and probity issues dominate the public sector (Syamsuddin et al., 2023; Yanuarisa et al., 2025), construction requires industry-specific approaches (Hansen et al., 2025), banking emphasizes forensic accounting and big data (Akinbowale et al., 2023), while external auditors need structured methods to assess fraud motives and rationalization (Kassem, 2022, 2024). Accordingly, fraud detection frameworks should be adapted to their institutional and industrial contexts.

Technology represents a major development in fraud detection, yet the literature does not support a technology-driven perspective. Big data analytics, electronic auditing, AI, machine learning, and full-population auditing enhance fraud identification, but their effectiveness depends on professional judgment, explainability, data quality, and ethical oversight (Al-Zoubi & Al-Taha, 2025; Shalhoob et al., 2024; Al Shammakhi et al., 2025; Li et al., 2024). Fraud detection should therefore be viewed as a socio-technical process in which technology identifies anomalies while auditors evaluate their significance.

Theoretically, this review proposes a four-domain framework consisting of the individual-cognitive, professional-ethical and forensic, organizational-governance, and technological-analytical domains. These domains integrate agency theory, fraud theory, professional skepticism, self-efficacy, and socio-technical perspectives, with professional skepticism serving as the central mechanism linking fraud cues, analytical results, and audit evidence.

Practically, audit firms, professional bodies, organizations, and regulators should strengthen fraud detection by integrating forensic accounting, digital analytics, ethical judgment, and professional skepticism into competency development, governance practices, and technology-enabled audit procedures.

This review has several limitations. Because the analysis relies primarily on Scopus-indexed studies, relevant evidence from other databases may not be included. In addition, the dominance of cross-sectional designs, self-reported measures, and inconsistent constructs limits causal interpretation and comparability across studies. Future research should employ longitudinal, experimental, field-based, and mixed-method approaches to better understand how auditors translate skeptical judgment into effective fraud detection within digital audit environments.

CONCLUSION, LIMITATIONS, SUGGESTIONS

This systematic literature review concludes that auditors' fraud detection ability is determined by four interrelated dimensions: individual-cognitive attributes, professional-ethical and forensic competence, organizational-governance support, and technological-analytical capability. Professional skepticism serves as the primary mechanism integrating these dimensions by enabling auditors to critically assess evidence, recognize fraud indicators, and determine the need for further investigation. Digital technologies improve audit coverage and

anomaly identification; however, they remain complementary to, rather than substitutes for, professional judgment.

Several limitations should be considered when interpreting the findings. The reviewed studies apply diverse research designs, measurements, institutional settings, sectors, and national contexts, which may constrain the comparability and generalizability of the results. Moreover, the synthesized evidence mainly reflects associative relationships and does not provide definitive causal explanations. The rapid evolution of digital audit technologies may also affect the continued relevance of some technological findings.

Future research should empirically validate the proposed four-domain framework through longitudinal, experimental, and mixed-method approaches. Cross-country and cross-sector comparisons are also necessary to examine how regulatory, cultural, and governance differences influence fraud detection performance. In practice, audit institutions should strengthen professional skepticism, forensic expertise, ethical commitment, data literacy, internal audit independence, and governance support to ensure that digital technologies are applied effectively and responsibly.

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