Analyzing the Impact of Robotic Process Automation (RPA) on Audit Quality and Auditors' Skills

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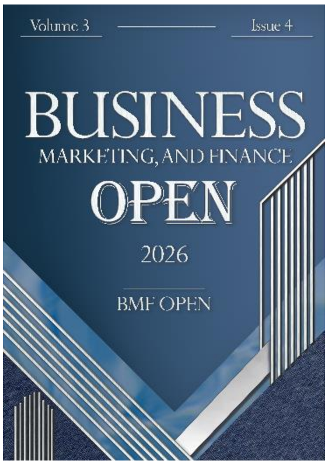

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Abstract: In the era of the Fourth Industrial Revolution, emerging technologies such as Robotic Process Automation (RPA) are transforming the accounting and auditing profession. By automating repetitive and rule-based tasks, this technology has the potential to enhance efficiency and accuracy. However, its implications for the dimensions of audit quality and the skill set required of auditors have not yet been fully understood. The primary objective of this study is to provide an in-depth analysis of the effects of RPA on audit quality and to identify the necessary transformations in auditors' skills from the perspective of industry experts. This study adopts a qualitative approach using the grounded theory strategy. Data were collected through semi-structured interviews with 15 audit managers and partners from large audit firms who had direct experience in implementing or utilizing RPA. Data analysis was conducted in three stages—open coding, axial coding, and selective coding—using MAXQDA software. The findings indicate that RPA significantly enhances audit quality by expanding audit coverage (from sampling to full-population testing), reducing human error, and providing more precise and timely audit evidence. The results also reveal a paradigm shift in the competencies required of auditors, with emphasis moving from operational and manual skills toward analytical capabilities, critical thinking, big data analytics, understanding of business processes and information technology, as well as communication and advisory skills. The implementation of RPA is not merely a technical enhancement but a strategic transformation of the audit process that elevates the role of the auditor from an executor to an analyst and strategic advisor. To fully leverage the benefits of this technology and maintain their competitive advantage, audit firms must make substantial investments in workforce reskilling and in attracting talent with hybrid competencies in auditing, technology, and data analytics.

Keywords: Robotic Process Automation; Audit Quality; Auditors' Skills; Digital Transformation; Grounded Theory.

1. Introduction

Audit quality has become a focal construct in contemporary assurance research because it sits at the intersection of capital-market confidence, organizational accountability, and the credibility of financial reporting. Across jurisdictions, audit quality is no longer treated as a static outcome of professional compliance; rather, it is understood as a multi-dimensional product shaped by auditor competence, independence, methodological rigor, engagement risk judgments, and the institutional environment in which assurance is delivered. Empirical and review-based evidence continues to show that conventional antecedents—such as competence and experience, professional skepticism, independence, and ethics—remain core predictors of the robustness of audit conclusions and the reliability of audit evidence [1-6]. In parallel, audit quality is also increasingly explained through governance-related and contextual drivers, including the role of internal audit and audit committees, board oversight, and the quality of corporate governance mechanisms that influence auditor–client dynamics and information flows [7]. This expanded view reflects a practical reality: as organizations become more complex and digitally mediated, the ability of auditors to obtain sufficient appropriate evidence depends not only on traditional audit procedures but also on technology-enabled access to high-volume, high-velocity, and high-variety data.

The audit profession's exposure to the Fourth Industrial Revolution has accelerated the transformation of assurance work from a predominantly manual, document-driven practice to one that is increasingly data-centric and technology mediated. The emerging technological ecosystem influencing assurance includes audit software platforms, cloud computing infrastructures, intelligent process automation, Robotic Process Automation (RPA), and artificial intelligence (AI)-enabled analytics. Research focusing on audit software indicates that the perceived usefulness of computerized tools is linked to improvements in audit effectiveness and, under certain conditions, audit quality, largely because digital tools standardize procedures, facilitate documentation, and improve engagement-level control [8]. Complementing this, evidence on cloud computing suggests that cloud-based environments can affect audit quality by expanding real-time access to client systems, reducing constraints related to data availability, and supporting more timely evidence acquisition and testing, although these benefits depend on the auditor's ability to manage technology risks and assess system reliability [9]. The broader implication is that, as the audit evidence environment becomes increasingly digital, audit quality becomes partly contingent on auditors' technological literacy and on their capacity to evaluate the integrity of digitally generated evidence.

Against this backdrop, RPA has emerged as a particularly salient technology because it targets a large portion of audit work that is routine, rules-based, and process oriented. RPA refers to software "bots" that emulate human actions to execute structured tasks across applications—such as extracting data from enterprise systems, reconciling datasets, populating working papers, and generating exception reports. The strategic attractiveness of RPA lies in its potential to enhance efficiency while simultaneously increasing audit coverage and standardizing repetitive procedures. A robust conceptual foundation for RPA in audit tasks has been articulated through framework-oriented research, which positions RPA as a tool capable of automating discrete audit activities while requiring governance controls over bot design, access, change management, and evidence logging [10]. In addition, research on the adoption of robotics in the auditing profession underscores that the move toward automated work is not merely technical; it is organizational and professional, affecting workforce design, training pathways, and perceptions of what constitutes high-quality assurance work [11]. The emergent view is that RPA can shift audit practice from labor-intensive execution to more exception-driven, analytic, and risk-focused assurance—provided that the automation itself is appropriately governed.

However, the diffusion of RPA into audit practice is accompanied by socio-technical challenges that directly implicate audit quality. Auditing is not a purely technical process; it is a professional practice embedded in teams, norms, judgments, and stakeholder expectations. From a socio-technical systems perspective, the challenges of using RPA in auditing include misalignment between automated routines and evolving client processes, difficulties in integrating bots with legacy systems, and risks associated with overreliance on automated outputs without adequate professional judgment and validation [12]. These challenges matter because audit quality depends not only on the speed of evidence production but on the sufficiency, appropriateness, and reliability of evidence, as well as the defensibility of the auditor's judgments. When automation reduces manual effort, the risk profile of the audit can shift toward new domains such as data integrity, access security, and algorithmic or rule-based misconfiguration—implying that auditors must extend their skepticism to technology-mediated evidence. The importance of technology-embedded risk and ethical considerations in AI-related audit adoption further reinforces this point, suggesting that governance, transparency, and professional responsibility become central when advanced digital tools are introduced into assurance workflows [13].

While RPA is a prominent automation layer, it is also part of a broader technological trajectory in which AI and advanced analytics are increasingly incorporated into audit planning, risk assessment, and substantive testing. Evidence from review-based research indicates that AI can improve aspects of the audit process by enabling pattern detection, anomaly identification, and more scalable analysis of complex datasets; yet the magnitude and reliability of such improvements depend on how auditors integrate AI outputs into human judgment and on the strength of controls around AI deployment [14]. Research has also shown that audit data analytics, when combined with contextual information such as internal control opinions, can shape stakeholders' perceptions of audit quality, assurance, and even auditor negligence, demonstrating that technology affects not only actual audit procedures but also external evaluations of audit credibility [15]. Related developments in internal auditing—such as the use of autoencoders for data-driven analysis—further illustrate the direction of travel: audit functions are increasingly expected to interpret algorithmic outputs and translate them into actionable and defensible assurance conclusions [16]. These streams collectively suggest that RPA should be conceptualized not as a standalone innovation but as part of an integrated digital audit architecture in which automation, analytics, and AI are combined to strengthen coverage, timeliness, and risk responsiveness.

The professional and institutional environment in which audits are conducted also shapes how technology adoption translates into audit quality. Audit quality is partially a social construct, influenced by cultural, legal, and institutional factors that define auditors' responsibilities and shape expectations about what constitutes sufficient assurance. Cross-context evidence indicates that these macro-level conditions influence auditors' roles, perceived obligations, and interpretations of audit quality, which implies that the same technology may be adopted and used differently across settings [17]. In the post-pandemic environment, research has also highlighted that auditor characteristics and contextual pressures can influence reporting behaviors—such as the articulation of Key Audit Matters—underscoring that audit outcomes are sensitive to external shocks and the professional judgments they trigger [18]. In a similar vein, the concept of "digital audit" has been framed as an imperative for competitiveness and recovery in certain national contexts, reinforcing that technology adoption is often linked to broader modernization agendas rather than isolated efficiency goals [19]. These perspectives matter for the present study because they support the proposition that RPA's impact on audit quality and auditor skills is likely to be shaped by contextual conditions such as regulatory expectations, firm governance, and client-system maturity.

The determinants of audit quality identified in the literature remain highly relevant as the profession digitalizes, but they may interact with technology in new ways. For instance, independence has long been treated as an essential precondition for audit credibility, with systematic reviews emphasizing its influence on audit outcomes and accounting behavior [20]. In technology-enabled audits, independence can be indirectly affected through reliance on client-provided systems, access configurations, and the extent to which auditors depend on management-controlled data pipelines. Similarly, professional skepticism—a consistent predictor of audit quality—may require reconceptualization when evidence is generated through automated routines rather than manual inspection. Evidence from studies conducted during the COVID-19 period indicates that skepticism, competence, and professionalism remain consequential even under disrupted conditions, suggesting that foundational professional attributes remain central even as audit tasks and evidence sources evolve [21]. Yet, as automation expands the scale of testing, the skill set required to exercise skepticism effectively increasingly includes the ability to interrogate the logic of automated procedures and the integrity of extracted data.

A related issue concerns the evolving competence profile of auditors in digital environments. Empirical work has documented that the use of information technology can affect auditor performance and has implications for audit quality, highlighting the practical linkage between digital tool usage and assurance outcomes [22]. Studies focusing on public information systems likewise suggest that auditors' performance can be influenced by the information environments in which they operate, implying that digital infrastructures shape productivity and potentially audit quality [23]. More granular research has emphasized the contribution of auditors' critical thinking skills to the quality of reporting outputs, which is increasingly important when auditors must interpret exceptions, evaluate complex evidence, and defend judgments supported by automated analyses [24]. Complementing this, research examining the role of personality traits, digital technology skills, and competency in the effectiveness of fraud risk assessment highlights that auditors' digital capabilities are increasingly intertwined with the quality of risk judgments and, therefore, with audit quality in high-risk contexts [25]. These findings imply that as RPA and related technologies become more prevalent, audit quality becomes progressively dependent on hybrid competencies that combine assurance expertise with technology literacy and analytical reasoning.

The literature also points to multiple engagement-level and market-level factors that influence audit quality and that may interact with digital transformation. Audit risk is widely framed as a mechanism through which audit planning, evidence depth, and resource allocation influence quality, with research emphasizing that managing audit risk is central to improving audit outcomes [26]. In technologically enhanced audits, RPA can support risk-based approaches by enabling broader scanning and faster exception identification, potentially improving risk responsiveness. At the same time, practical constraints such as time budget pressure remain salient, with evidence suggesting that competence, accountability, professional skills, and skepticism can influence audit quality, and that time budget pressure may moderate these relationships [4]. This is significant because one commonly cited rationale for RPA adoption is the need to relieve time pressure by automating routine steps; yet the net impact on quality will depend on whether the time saved is reinvested into higher-order judgment and risk work or dissipated through expanded scope and expectations.

In addition to professional attributes and engagement conditions, reputation and market dynamics also shape audit quality and audit outcomes. Auditor switching, audit delay, and financial distress are among factors that can influence perceptions of audit credibility and audit process outcomes, with evidence from sector-specific contexts indicating that reputation can affect auditor switching through channels such as audit delays and distress conditions [27]. In digital audit settings, automation may influence audit timeliness and documentation efficiency, potentially affecting audit delay and related reputational outcomes. Research examining audit firm reputation, auditor rotation, specialization, and fees also points to the continuing relevance of structural and economic variables in shaping audit quality, implying that technology adoption occurs within broader competitive and governance frameworks that influence audit engagements [28]. Moreover, audit quality is not only influenced by auditor attributes but also by how audit firms structure joint audit arrangements and resource oversight; perceptions-based evidence suggests joint audit can be associated with audit quality under certain conditions, reflecting the importance of audit structure in the delivery of assurance [29]. These considerations support the view that the quality effects of RPA are likely to vary across firms and engagements depending on governance maturity, resource strategies, and institutional arrangements.

Recent research also underscores that "audit quality" is increasingly linked to sustainability of assurance outcomes in technologically advancing environments. Conceptual and empirical discussions of AI adoption suggest that technology can be positioned as a route to sustainable audit quality when the audit function builds the capacity to integrate advanced tools responsibly and consistently, rather than adopting them in fragmented or purely symbolic ways [30]. Strategy-oriented approaches to AI application in accounting similarly emphasize that audit technology adoption should be aligned with organizational strategy and capability development, suggesting that the governance of technological change is as important as the tools themselves for realizing sustained quality improvements [31]. This strategic framing is directly relevant to RPA because RPA implementation often begins as a localized automation initiative but can evolve into an enterprise-level audit transformation program that affects methodology, training, and service delivery models.

At the methodological frontier, the digitalization of audit is also expanding into new asset classes and novel audit objects, which require revised procedures and technological sequencing. For example, the auditing of cryptocurrency exchanges demands technology-informed procedures and new sequences of evidence collection and validation, which illustrates how the audit profession's competence requirements continue to expand as the economy digitalizes [32]. Although cryptocurrency auditing is distinct from conventional RPA applications, it reinforces a broader point: modern audit quality increasingly depends on technology-aware procedures and on auditors' capacity to understand complex digital ecosystems. Similarly, the role of shared and same-signing auditors in enhancing audit quality in M&A settings shows that audit quality outcomes remain sensitive to engagement structures and auditor coordination mechanisms even as the profession adopts new technologies [33]. These findings suggest that any analysis of RPA's impact on audit quality should be situated within a broader landscape of evolving audit practices, engagement configurations, and technology adoption pathways.

Despite the growing body of work on audit quality determinants and on digital tools in auditing, several gaps remain salient. First, much of the existing evidence addresses discrete technologies (such as audit software, cloud tools, or AI analytics) or focuses on perceived impacts rather than mapping a comprehensive pathway from technology adoption to specific audit quality dimensions and the corresponding evolution of auditor skills [8, 9, 14]. Second, while frameworks for applying RPA to audit tasks exist, there remains a need for context-sensitive, practice-based insights that explain how RPA changes the audit workflow, how it redistributes human effort and judgment, and what competencies become essential as a result [10, 12]. Third, the literature increasingly recognizes that auditor cognition and performance are shaped by interactions among auditors, managers, regulation, and technology, implying that technology effects cannot be isolated from organizational and institutional dynamics [34]. Finally, although studies have examined audit quality in diverse contexts—including internal auditing analytics, digital audit imperatives, and post-crisis conditions—there is still limited integrative evidence explaining RPA as a socio-technical capability that simultaneously affects audit quality mechanisms and auditor skill requirements in an emerging-market environment [16, 18, 19].

Building on these gaps, the present study positions RPA as a focal technology that can reshape audit quality through multiple mechanisms—coverage expansion, error reduction, timeliness, traceability, and risk-focused resource reallocation—while also driving a competency shift toward analytics, critical thinking, technology governance, and advisory communication. Prior evidence indicates that auditor competence, experience, and professionalism remain pivotal for quality outcomes, yet the content of "competence" is evolving as digital tools become embedded in audit work [1, 22]. Likewise, independence, skepticism, ethics, and risk sensitivity continue to anchor audit credibility, but they must be practiced in an environment where evidence is increasingly generated or mediated by automated routines and analytics engines [3, 20, 25, 26]. As organizations and audit firms pursue digital transformation, the strategic question is not merely whether RPA can make auditing faster, but whether it can make auditing better—by strengthening the sufficiency and appropriateness of evidence and improving the defensibility of professional judgments under modern data conditions.

This study therefore contributes by offering a grounded, practice-informed analysis of how RPA affects audit quality and how it redefines auditors' skills in the contemporary assurance environment, while situating these insights within the broader streams of audit quality determinants, digital audit transformation, and socio-technical risk governance [11, 31, 34]. It also responds to emerging concerns about the ethical and risk dimensions of advanced technology adoption in auditing, recognizing that sustainable improvements in audit quality require not only automation capability but also robust governance, transparency, and professional accountability [13, 30]. Moreover, by acknowledging that audit quality perceptions and practices are shaped by institutional and cultural contexts, the study aligns with evidence that auditors' roles and quality interpretations vary across environments, which is particularly relevant when examining technology adoption in settings with distinct regulatory and market structures [17, 19].

The aim of this study is to analyze the impact of Robotic Process Automation on audit quality and to identify the resulting changes in the skill set required of auditors.

2. Methodology

Given the exploratory nature of the subject and the objective of achieving a deep and rich understanding of the experiences, perspectives, and interpretations of auditing professionals, this study adopts a qualitative research approach. The underlying philosophical paradigm of this research is interpretivism, as the study seeks to understand phenomena through the meanings that individuals assign to them. Among the various qualitative research strategies, the grounded theory approach, originally introduced by Glaser and Strauss (1967), was selected as the principal methodological framework. This choice is justified by the fact that grounded theory enables the researcher to inductively and systematically generate a theory or conceptual model directly from the collected data, rather than testing a pre-existing theory. Considering the emerging nature of RPA in auditing and the absence of comprehensive theoretical frameworks in this domain, this approach is particularly appropriate for identifying key concepts, examining their interrelationships, and ultimately developing a conceptual model that explains the impact of RPA on audit quality and auditors' skills.

The statistical population of this study comprises audit managers, senior managers, and audit partners employed in large audit firms in Iran that are officially recognized by the Supreme Audit Court and the Stock Exchange Organization and that possess practical experience in the design, implementation, or application of RPA tools within audit processes. Purposive sampling and theoretical sampling were employed. Initially, through purposive sampling, individuals with extensive knowledge and experience related to the research topic were identified and selected for interviews. Subsequently, concurrent with data analysis, additional participants were selected based on emerging concepts in order to ensure comprehensive coverage of the developing categories. This process continued until theoretical saturation was achieved, meaning that no new data contributed additional insights to the evolving concepts and categories. In total, in-depth semi-structured interviews were conducted with 15 experts. Each interview lasted between 60 and 90 minutes, was fully audio-recorded, and subsequently transcribed verbatim for analysis.

Data analysis followed the systematic approach proposed by Strauss and Corbin (1998) and was conducted in three principal stages. The first stage, open coding, involved careful examination of the interview transcripts and their segmentation into small meaning units (concepts), with a conceptual label assigned to each unit. At this stage, the researcher sought to extract concepts from the data with an open mind and without prior assumptions. The second stage, axial coding, entailed organizing the concepts and codes derived from the previous phase into broader categories and subcategories based on their similarities and relationships, with the objective of establishing connections among categories and constructing an initial analytical framework. Finally, during selective coding, a core category was identified as the central phenomenon of the study, and all other categories were systematically related to it, enabling the construction of the main storyline of the research and the development of the final grounded theory. To enhance the credibility and reliability of the findings, peer debriefing and member checking procedures were employed in the validation process.

3. Findings and Results

First, the profile of the expert informants is presented in Table 1 to demonstrate the adequacy and relevance of the informant base.

Table 1. Profile of Interview Participants (n = 15)

Participant ID	Position	Firm Size/Standing	Primary Audit Domain(s)	Years of Audit Experience	Years in Managerial Role	Direct RPA Exposure	Typical RPA Use-Case(s) Mentioned
P1	Audit Partner	Large / market-recognized	Listed entities; financial services	18	10	Implementation sponsor	Automated data extraction; controls testing
P2	Audit Partner	Large / market-recognized	Manufacturing; trading	16	9	User + governance	Reconciliations; substantive testing
P3	Audit Partner	Large / market-recognized	Banking; insurance	20	12	Implementation sponsor	Full-population testing; exception reporting
P4	Senior Manager	Large / market-recognized	Listed entities; conglomerates	14	6	Power user	Journal entry screening; analytics pipelines
P5	Senior Manager	Large / market-recognized	Oil & gas; utilities	13	5	User	Evidence collection; confirmations workflow
P6	Senior Manager	Large / market-recognized	Telecommunications; services	12	5	User + design input	Data extraction from ERP; audit trail capture
P7	Audit Manager	Large / market-recognized	Manufacturing; retail	11	3	User	Inventory testing support; matching routines
P8	Audit Manager	Large / market-recognized	Public-interest entities	10	3	User	Sampling support; automated lead schedules
P9	Audit Partner	Large / market-recognized	Listed entities; investment firms	17	10	Governance lead	Audit automation roadmap; QA monitoring
P10	Senior Manager	Large / market-recognized	Construction; project-based firms	15	7	User	Contract testing; billing-to-ledger matching

P11	Audit Manager	Large / market-recognized	SMEs; trading	9	2	User	Bank reconciliations; receivables aging
P12	Audit Partner	Large / market-recognized	Financial services; fintech	19	11	Implementation sponsor	Continuous controls monitoring; exception handling
P13	Senior Manager	Large / market-recognized	Public sector–linked entities	14	6	User + governance	Compliance testing; documentation automation
P14	Audit Manager	Large / market-recognized	Manufacturing; logistics	10	3	User	Three-way match; cut-off testing support
P15	Audit Partner	Large / market-recognized	Multi-industry portfolio	21	13	Sponsor + user	End-to-end audit workflow orchestration

Table 1 demonstrates that the interview corpus reflects high-relevance expertise and credible experiential depth with respect to both auditing practice and the practical application of RPA in audit engagements. The participants are distributed across roles that are consequential for audit transformation—partners (strategic decision-makers and quality owners), senior managers (methodology translators and engagement supervisors), and managers (operational implementers and day-to-day users). This role distribution is important because the analysis captures not only front-line automation experiences, but also governance, quality assurance, and firm-level capability development perspectives. The participants collectively represent a broad portfolio of audit domains, spanning listed entities, financial services, manufacturing, utilities, telecommunications, and public-interest contexts, which strengthens the transferability of the emergent patterns across engagement types. Experience levels indicate that the interpretations are grounded in mature professional judgment rather than novice exposure; most participants combine extensive audit tenure with multiple years in managerial or partner roles, where accountability for audit quality is explicit. The "Direct RPA Exposure" column also confirms that the sample is not limited to superficial awareness: the participants include implementation sponsors and governance leads (who observe organizational consequences), power users (who experience workflow and evidence changes), and hybrid user-design contributors (who can explain how RPA is configured and controlled). Finally, the diversity of "Typical RPA Use-Cases" indicates that RPA is being applied across the audit lifecycle—from data extraction and reconciliation to full-population testing, journal entry screening, and exception reporting—creating a rich basis for identifying common mechanisms through which RPA influences audit quality and reshapes auditors' skills.

Table 2. RPA Mechanisms That Enhance Audit Quality: Categories, Subcategories, and Manifest Indicators

Main Category	Subcategory	How It Presents in Practice (Manifest Indicators)	Audit-Quality Dimension Most Directly Affected
Expansion of Audit Coverage	Shift from sampling to full-population testing	Automated execution of repetitive tests across entire datasets; systematic exception listing	Sufficiency of evidence; detection risk reduction
	Increased frequency of testing	More frequent (and in some cases near-continuous) re-performance of tests during the engagement	Timeliness of evidence; responsiveness to emerging risks
Reliability and Precision of Evidence	Reduction of human execution error	Fewer manual transposition errors; fewer missed steps in test procedures; consistent rule application	Reliability of evidence; procedural compliance

	Standardization of audit procedures	Repeatable scripts/bots that perform the same steps across engagements and teams	Consistency of audit work; comparability across files
Timeliness and Traceability	Faster evidence generation and documentation	Accelerated collection of source documents; automated audit trails/log files	Documentation quality; review efficiency
	Improved traceability and reproducibility	System logs and run histories that support re-performance and inspection	Inspectability; quality control and external review readiness
Risk-Focused Reallocation of Auditor Time	Less time on routine tasks	Manual effort moved away from data wrangling and toward risk analysis and judgment	Appropriateness of professional judgment; focus on high-risk areas
	Enhanced anomaly focus through exception reporting	Bots highlight outliers, breaks, and unusual patterns for auditor follow-up	Detection of irregularities; fraud-risk responsiveness
Strengthening of Methodological Control	Embedded controls and rule governance	Defined rulesets; version control; approval of bot changes; segregation of duties for scripts	Process integrity; audit methodology compliance
	Quality assurance visibility	Better supervisory review through dashboards, exception summaries, and run evidence	Engagement supervision; accountability and quality monitoring

Table 2 synthesizes how participants described the pathway from automation capability to measurable improvements in audit quality, with the strongest and most consistent mechanism being the expansion of audit coverage. Across engagement contexts, interviewees converged on the idea that RPA changes the feasibility frontier of audit testing: procedures that were previously constrained by time and staffing—often executed via sampling—become technically feasible at the level of full-population testing when rules are stable and data extraction is reliable. This does not eliminate professional judgment; rather, it alters where judgment is applied. Instead of spending scarce human time running routine steps on small subsets, audit teams use bot-executed tests to map the entire population, and then concentrate judgment on investigating exceptions and explaining anomalies. Participants linked this shift directly to a reduction in detection risk, because the probability that material deviations remain outside the sample frame is substantially reduced when coverage expands.

A second cluster of findings concerns evidence reliability and precision. RPA was consistently experienced as a "procedural stabilizer" that reduces execution variance across staff levels and engagement teams. By automating rule-based steps—such as matching, recalculations, reconciliations, and structured extraction—RPA reduces manual transposition and omission errors and produces outputs that are consistent across runs. Participants emphasized that this standardization improves audit-file consistency and strengthens supervisory review, because reviewers can more readily assess whether procedures were executed correctly when outputs are produced through documented, repeatable routines. This standardization effect is not merely administrative; it was interpreted as a quality improvement because it increases procedural compliance and reduces the chance that audit evidence is compromised by avoidable execution mistakes.

Timeliness and traceability form the third mechanism set. Interviewees described that RPA accelerates both evidence generation and documentation production, resulting in audit trails that are more complete and easier to inspect. Rather than relying on scattered manual screenshots or ad hoc spreadsheets, automated runs can produce logs, timestamps, and exception listings that directly support re-performance and inspection. This contributes to review efficiency and strengthens readiness for internal quality reviews or external inspections, because the evidence chain is easier to follow and less dependent on individual staff documentation habits.

Finally, participants repeatedly framed the "quality gain" of RPA as partially indirect: by saving time on routine tasks, RPA reallocates human effort toward risk analysis, critical evaluation of exceptions, and deeper engagement-level understanding of business processes. This is where RPA intersects with the "appropriateness" dimension of audit quality as understood in practice: audit teams can devote more attention to interpreting anomalies, challenging management explanations, and tailoring responses to engagement-specific risks. Importantly, participants did not describe RPA as inherently increasing skepticism; instead, they argued that RPA creates the capacity conditions under which professional skepticism can be exercised more consistently—because auditors are less time-pressured and better equipped with structured exception insights. As a result, the consolidated story in Table 2 is that RPA improves audit quality through a combined effect of broader coverage, higher procedural reliability, stronger traceability, and a reallocation of human expertise toward higher-order judgment and risk-focused work.

Table 3. Paradigm Shift in Auditors' Skills Under RPA: From Execution-Centric to Insight-Centric Competencies

Skill Domain	Pre-RPA Dominant Emphasis (Execution-Centric)	Post-RPA Emerging Emphasis (Insight-Centric)	Practical Implications Observed by Participants
Analytical reasoning and professional judgment	Manual checking and tick-and-tie routines	Interpreting exceptions; forming defensible judgments under uncertainty	Auditors are expected to explain "why" anomalies occur, not only "whether" numbers match
Critical thinking and skepticism	Procedural completion under time constraints	Hypothesis-driven inquiry; challenge of automated outputs and management narratives	Greater emphasis on evaluating plausibility and triangulating explanations
Data analytics capability	Basic spreadsheet manipulation	Handling large datasets; defining rules for anomaly detection; interpreting patterns	Need for literacy in data structure, joins/matches, and analytic logic
IT and automation governance literacy	Limited to using audit software tools	Understanding bots, process maps, access controls, logs, and change management	Auditors must assess the reliability of the automation pipeline as part of evidence evaluation
Business process understanding	Focus on financial statement line-items	End-to-end process mapping (order-to-cash, procure-to-pay, record-to-report)	Stronger linkage between controls, data flows, and audit procedures
Communication and advisory competence	Reporting findings in standardized formats	Translating analytic results into actionable insights; consulting-style communication	Increased need to explain technology-enabled findings to non-technical stakeholders
Team and engagement management	Task assignment and manual supervision	Orchestrating human–bot workflows; ensuring quality gates and exception follow-up	Engagement leaders coordinate automation runs and allocate human time to investigations
Continuous learning orientation	Periodic technical updates	Ongoing upskilling in tools, analytics, and technology risk	Skills obsolescence risk increases without structured reskilling programs

Table 3 presents the second major result set: participants consistently framed RPA as a driver of a competency reconfiguration in auditing, characterized by a shift from execution-centric skills toward insight-centric capabilities. In the pre-RPA mode described by interviewees, competence was frequently demonstrated through procedural accuracy and speed—completing checklists, performing manual tick-and-tie work, running routine recalculations, and ensuring that standard steps were executed within time budgets. While these abilities remain relevant, participants explained that RPA reduces the marginal value of purely manual execution because many repetitive steps can be performed more consistently and quickly by automation. Consequently, the differentiating value of the auditor increasingly lies in the ability to interpret outputs, explain anomalies, and make professional judgments that are defensible under scrutiny.

A central theme was the elevation of analytical reasoning and critical thinking. Participants emphasized that full-population testing and exception reporting generate more signals, not fewer; this increases the demand for auditors who can triage exceptions, develop hypotheses about root causes, and test those hypotheses through additional procedures. The "work" is thus displaced from mechanical checking to diagnostic reasoning. This shift also changes the nature of skepticism: rather than skepticism being expressed primarily through manual verification, it is expressed through the rigorous interrogation of patterns, outliers, and inconsistencies—both in client data and, importantly, in the automated outputs themselves. Several participants noted that auditors must learn to challenge automation results when inputs, business rules, or system interfaces may be imperfect; thus, skepticism becomes partly "technology-aware," requiring an understanding of where automation can fail (e.g., incomplete extraction, rule misconfiguration, access limitations).

The data also indicated that data analytics and IT governance literacy are no longer optional specialist skills but increasingly part of baseline audit competence in RPA-enabled environments. Participants described practical expectations such as understanding process maps, assessing log evidence, ensuring appropriate access and change control for bots, and recognizing when automation runs require validation or re-performance. This competence intersects with business process understanding: RPA forces auditors to look beyond ledger balances to the data flow across processes (order-to-cash, procure-to-pay, record-to-report), because automation logic is usually anchored in process steps and system data structures. Auditors therefore need a more integrated mental model of how transactions originate, flow, and are transformed across systems and controls.

Finally, Table 3 highlights the managerial and communicative consequences of RPA: engagement leaders must orchestrate human–bot workflows, set quality gates for automation runs, and ensure that exceptions receive appropriate human follow-up. As the audit product becomes more analytics-driven, auditors must also translate technical findings into clear messages for engagement teams, clients, and those charged with governance. Participants framed this as a move toward advisory communication, where auditors are expected to explain implications, not merely report discrepancies. In sum, the findings show that RPA adoption redefines "what good looks like" for auditors: proficiency shifts toward analytics, technology-enabled assurance, process understanding, and stakeholder communication, supported by a stronger continuous-learning orientation to manage rapid skill obsolescence.

Table 4. Final Grounded-Theory Model: RPA as a Strategic Reconfiguration of Audit Work and Auditor Role

Model Element (Strauss–Corbin Logic)	Emergent Components	What It Means in the Audit Context
Core Category	Strategic reconfiguration of audit work through RPA-enabled evidence and exception-driven assurance	RPA changes how evidence is produced, what becomes "routine," and where human judgment is concentrated
Causal Conditions	High volume and complexity of client data; pressure for efficiency and timeliness; demand for higher assurance	RPA adoption is triggered by scalability constraints and quality expectations that manual routines cannot meet consistently
Contextual Conditions	Client system maturity; data availability and integrity; audit-firm methodology and tool stack	RPA impact is strongest when data pipelines are stable and audit methods support automation governance
Intervening Conditions	Talent readiness; training investment; IT support; regulatory/inspection pressure; cybersecurity controls	These conditions amplify or weaken the quality benefits and determine whether RPA becomes robust or fragile
Action/Interaction Strategies	Bot-enabled full-population testing; automated documentation and traceability; exception triage routines; governance of rules and changes	Audit teams operationalize RPA through repeatable runs, structured follow-up, and controlled automation lifecycle management
Consequences	Improved evidence sufficiency and reliability; faster audits and stronger reviewability; role shift toward analyst/advisor; revised competency model	Audit quality improves, but only sustainably when skills and governance evolve alongside automation

Table 4 integrates the full set of categories into the final grounded-theory explanation of the phenomenon under study. The core category that emerged from selective coding conceptualizes RPA not as a discrete tool, but as a strategic reconfiguration of audit work that is enabled by automated evidence generation and structured, exception-driven assurance. Participants' accounts repeatedly converged on the idea that the "center of gravity" in auditing moves when RPA is introduced: what used to consume human time becomes automated, and what used to be constrained by feasibility (such as full-population testing) becomes operationally realistic. This shift changes both the technical architecture of audit evidence and the social organization of audit teams. The model therefore positions RPA as a mechanism that restructures the audit workflow and, in doing so, restructures the auditor role.

The causal conditions in Table 4 indicate why RPA becomes attractive and, in many cases, necessary. Participants described an environment characterized by increasing data volume, higher transaction complexity, and growing expectations for timely completion and higher assurance. Under these conditions, manual routines are seen as both costly and vulnerable to inconsistency. RPA is adopted as an attempt to resolve a scalability–quality tension: to improve coverage and evidence reliability without proportionally increasing staffing and time budgets. However, the model emphasizes that the impact of RPA is highly contingent on contextual conditions, particularly client system maturity and data integrity. When source systems are stable and data extraction is consistent, RPA can generate reliable, repeatable evidence and logs. When systems are fragmented, data definitions are inconsistent, or access is constrained, RPA can produce partial evidence, increase reconciliation workload, or create new forms of risk that must be managed through audit methodology. This is why participants frequently moved from discussing "automation" to discussing "automation governance," noting that RPA's benefits are maximized when it is embedded within a disciplined methodological and technological context.

Intervening conditions capture the organizational factors that determine whether RPA becomes a durable audit capability or an unstable experiment. The dominant intervening condition is talent readiness: without auditors who can validate automation logic, interpret exceptions, and manage technology risk, the potential quality gains can be diluted or even reversed through overreliance on scripts. Participants also emphasized that investment in training, IT support, and cybersecurity controls mediates outcomes, because automation introduces dependencies on access control, change management, and log integrity. Furthermore, regulatory and inspection environments were described as indirectly influential: where inspection pressure is high, firms tend to formalize governance and documentation practices, which strengthens RPA's contribution to audit traceability and review readiness.

The action/interaction strategies in Table 4 represent what audit teams actually do to translate RPA into audit work. The most salient strategy is shifting toward bot-enabled full-population testing, supported by automated documentation and reproducible audit trails. This is coupled with formal exception triage routines, in which auditors prioritize and investigate anomalies produced by automated tests. Crucially, the strategy set includes governance of rules and changes, reflecting the interviewees' view that uncontrolled automation can undermine evidence reliability. In the model, sustainable RPA-enabled auditing requires an operating discipline that treats bots as part of the audit method, subject to controls, approvals, and re-performance expectations.

Finally, the consequences reported in Table 4 consolidate the outcomes that participants associated with successful RPA integration. At the audit-quality level, the most consistent consequences are improved evidence sufficiency (because coverage expands) and improved reliability (because execution error is reduced and procedures are standardized), along with faster completion and stronger reviewability (because documentation and logs are more traceable). At the professional level, the consequence is a clear role shift: auditors are repositioned as analysts and strategic advisors who interpret patterns, explain implications, and communicate technology-enabled findings to stakeholders. This role shift requires a revised competency model, aligning with Table 3: the audit profession's value proposition increasingly depends on analytics capability, technology governance literacy, and consultative communication, supported by continuous learning and reskilling. In short, the final grounded-theory model explains the findings as a structured transformation: RPA elevates audit quality through coverage, reliability, and traceability mechanisms, while simultaneously demanding—and accelerating—a redefinition of auditors' skills and professional identity.

4. Discussion and Conclusion

The findings of this study demonstrate that Robotic Process Automation (RPA) represents a fundamental transformation in audit practice rather than a mere technological enhancement. The empirical results revealed that RPA improves audit quality primarily through the expansion of audit coverage, the reduction of human error, the enhancement of evidence timeliness and traceability, and the reallocation of auditor effort from routine execution to analytical and judgment-intensive activities. These findings are strongly aligned with prior theoretical and empirical work that positions digital technologies as enablers of audit quality through improved efficiency, standardization, and risk responsiveness. In particular, the observed shift from sampling-based procedures toward full-population testing directly supports the framework proposed by Eulerich et al. [10], which conceptualizes RPA as a mechanism for automating structured audit tasks while enhancing the consistency and reliability of audit procedures. The present study extends this framework by empirically illustrating how this automation effect restructures the locus of professional judgment, moving it from manual verification toward exception analysis and strategic evaluation.

The improvement in evidence reliability and precision identified in the results is consistent with the argument that digital audit tools strengthen audit quality by reducing execution variability and increasing procedural compliance. Prior studies on audit software and cloud-based environments have demonstrated that technology adoption enhances audit effectiveness by standardizing processes and facilitating documentation [8, 9]. The current findings provide deeper insight into this relationship by showing that RPA-generated evidence is perceived by practitioners as more consistent, reproducible, and reviewable, thereby strengthening both internal quality control and external inspection readiness. This observation also complements the work of Barr-Pulliam et al. [15], who reported that the use of audit data analytics influences perceptions of audit quality and assurance. Together, these findings suggest that RPA contributes not only to actual improvements in audit procedures but also to the credibility and defensibility of audit outcomes.

Another central result concerns the significant enhancement of audit timeliness and traceability. Participants in this study emphasized that automated documentation and system-generated logs allow for faster evidence collection and more transparent audit trails. These findings are congruent with the concept of "digital audit" articulated by Nazarova et al. [19], which frames technology-enabled auditing as a strategic imperative for increasing both competitiveness and accountability. Furthermore, the improvement in traceability supports the view advanced by Fedyk et al. [14], who argued that artificial intelligence and related digital technologies can improve audit processes when they enhance evidence availability and support robust verification mechanisms. The present study therefore reinforces the proposition that RPA strengthens the structural foundations of audit quality by embedding transparency and reproducibility into the audit workflow.

Beyond technical improvements, the findings highlight a profound transformation in auditors' roles and competencies. The shift from execution-centric to insight-centric work reflects a broader redefinition of professional value in the auditing field. The results show that auditors increasingly act as analysts and strategic advisors who interpret exceptions, diagnose risks, and communicate complex findings to stakeholders. This transformation directly corresponds with Austin et al.'s [34] conceptualization of the "data analytics journey," in which auditors' interactions with technology, management, and regulation reshape professional cognition and performance. The present findings further substantiate this model by demonstrating that RPA accelerates this cognitive shift, making analytical reasoning, critical thinking, and technology governance central dimensions of auditor competence.

The emergence of hybrid competencies observed in this study—combining audit expertise with data analytics, IT literacy, and advisory communication—also aligns closely with empirical evidence on auditor performance and technology use. Ida Ayu Trisna Yudi and Suariedewi [22] documented that the use of information technology significantly influences auditor performance and, by extension, audit quality. Similarly, Ridzuan et al. [25] demonstrated that digital technology skills and competency play a critical role in the effectiveness of fraud risk assessment. The current study expands these insights by showing that RPA institutionalizes these hybrid competencies, transforming them from supplementary skills into core professional requirements for maintaining audit quality in technologically advanced environments.

Importantly, the findings also confirm that foundational audit attributes—such as independence, professional skepticism, competence, and ethical commitment—remain essential even as audit practice becomes increasingly automated. However, their operationalization evolves. Prior research has established the continuing importance of these attributes in determining audit quality [1, 3, 5, 20]. The present study demonstrates that in RPA-enabled audits, skepticism and independence must be exercised not only in relation to client representations but also toward automated outputs and underlying data processes. This extension of professional skepticism into the technological domain echoes the concerns raised by Dahabiyeh and Mowafi [12], who emphasized the socio-technical risks associated with RPA in auditing. The results therefore reinforce the view that audit quality in digital environments depends on the auditor's capacity to integrate professional judgment with technological validation.

The strategic implications of RPA adoption also emerge clearly from the findings. RPA is not implemented in isolation; its effectiveness depends on contextual conditions such as client system maturity, data integrity, governance structures, and organizational readiness. This observation is consistent with Hung's [17] argument that cultural, legal, and institutional factors shape auditors' roles and perceptions of audit quality. It is also aligned with Tritama et al.'s [30] assertion that sustainable audit quality in the age of AI requires alignment between technology adoption and organizational strategy. By situating RPA within a broader socio-organizational framework, the present study underscores that technology-driven improvements in audit quality are contingent upon governance, training investment, and continuous capability development.

Furthermore, the findings demonstrate that RPA strengthens audit quality by enabling a more risk-focused audit approach. Automated full-population testing and structured exception reporting allow auditors to allocate more time to high-risk areas and complex judgments, which is consistent with the central role of audit risk in shaping audit quality identified by Doloksaribu and Firdaus [26]. This risk reorientation is particularly important in contexts characterized by time budget pressure, where competence and skepticism must be exercised under significant constraints [4]. The present results suggest that RPA can mitigate some of these pressures by automating low-value tasks and freeing human resources for critical risk analysis.

Finally, the results reveal that RPA contributes to audit quality by reinforcing engagement-level governance and reviewability. Participants described enhanced supervisory oversight, clearer documentation, and stronger quality control mechanisms enabled by automated logs and dashboards. These observations resonate with prior evidence that governance mechanisms, including internal audit and board oversight, are essential determinants of audit quality [7]. They also complement the literature on joint audits and auditor coordination, which emphasizes the importance of engagement structure in achieving high-quality outcomes [29, 33]. By embedding control and traceability into the audit process, RPA supports these governance mechanisms and strengthens the institutional architecture of audit quality.

This study has several limitations that should be acknowledged. First, the research adopted a qualitative methodology and relied on a purposive sample of audit professionals, which limits the statistical generalizability of the findings. Second, the study focused on the perspectives of auditors within a specific institutional and regulatory context, which may influence the transferability of the results to other jurisdictions with different professional frameworks. Third, the analysis was based on self-reported experiences, which may be subject to perception bias or social desirability effects, particularly in relation to the evaluation of emerging technologies. Finally, the study concentrated on current RPA applications and did not capture the long-term organizational consequences of automation on audit careers, firm structures, or professional identity.

Future research should extend this work through large-scale quantitative studies that test the relationships identified in this qualitative analysis across different countries and regulatory regimes. Longitudinal research designs would be particularly valuable for examining how sustained RPA adoption reshapes audit quality, professional roles, and career trajectories over time. Comparative studies between RPA-enabled and non-RPA audit engagements could provide stronger causal evidence regarding the specific contribution of automation to audit outcomes. In addition, future research should explore the interaction between RPA and other advanced technologies, such as artificial intelligence and continuous auditing systems, to develop a more integrated understanding of digital audit ecosystems.

From a practical perspective, audit firms should view RPA as a strategic capability rather than a narrow operational tool. Significant investment is required in training programs that develop hybrid competencies combining auditing, data analytics, and information technology governance. Firms should also establish robust automation governance frameworks that ensure transparency, accountability, and continuous validation of automated procedures. Engagement leaders must redesign audit workflows to fully exploit the time-saving potential of RPA while safeguarding professional judgment and ethical standards. Finally, regulators and professional bodies should update competency frameworks and continuing professional development requirements to reflect the evolving demands of technology-enabled auditing.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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