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Blockchain, Automation, and AI in Accounting: Challenges, Opportunities, and Global Perspectives

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ABSTRACT: Digital transformation represents a significant evolution in the accounting profession, characterized by the integration of artificial intelligence, automation, and blockchain technologies. This study aims to synthesize and critically evaluate current evidence on how these technologies shape accounting practices, professional roles, and organizational processes. The review employed a structured methodology involving multiple academic databases, targeted keywords, and explicit inclusion and exclusion criteria to identify peer-reviewed studies relevant to digital transformation in accounting. The findings indicate that AI adoption improves audit efficiency and reduces costs by automating repetitive processes and enabling advanced analytics. Automation enhances accuracy and timeliness in financial reporting, with large organizations benefiting most from advanced ERP systems, while SMEs rely increasingly on accessible cloud-based solutions. Blockchain contributes to transparency and data integrity through immutable records, but adoption is uneven across regions due to regulatory and infrastructural disparities. The discussion emphasizes that systemic factors—organizational culture, regulatory frameworks, and technological infrastructure—critically influence outcomes, while government incentives, training initiatives, and partnerships with technology providers are key strategies for overcoming adoption barriers. Limitations in the literature include fragmented focus on individual technologies, geographical bias toward developed economies, and insufficient attention to professional identity and ethics. The review concludes that addressing these gaps and promoting inclusive digital strategies are essential for ensuring sustainable transformation in accounting. These findings have significant implications for policymakers, educators, and practitioners seeking to align accounting practices with the demands of the digital era.

Keywords: Digital Transformation in Accounting, Artificial Intelligence in Auditing, Automation in Financial Reporting, Blockchain in Accounting, Accounting Profession Adaptation, Regulatory Frameworks and Digitalization, Global Perspectives on Accounting Technology.

INTRODUCTION

The accounting profession is experiencing an unprecedented transformation driven by the rapid integration of digital technologies, most notably artificial intelligence (AI), automation, and blockchain. This digital transformation has reshaped traditional accounting practices, shifting the field from a focus on manual bookkeeping and data entry to more strategic roles in decision-

making and business advisory. Scholarly discourse increasingly acknowledges the significance of this evolution, highlighting both its disruptive potential and its capacity to redefine professional competencies in accounting (Assidi et al., 2025; Vandapuye & Jabraoui, 2024). At the global level, the profession is witnessing the emergence of technology-enabled processes that alter workflows, organizational structures, and even the ethical frameworks within which accountants operate (Deliu & Olariu, 2024). Such developments underscore the importance of studying digital transformation comprehensively, as its impact transcends operational efficiency to encompass broader questions of governance, transparency, and professional identity.

Artificial intelligence represents a pivotal force within this transformation. The application of AI technologies in accounting facilitates automation of routine tasks, optimization of resource allocation, and enhanced real-time financial analysis. Research has demonstrated that AI adoption leads to a 75.7% improvement in the functional responsibilities of accounting professionals, indicating a substantial reconfiguration of the profession's core activities (Assidi et al., 2025). Beyond efficiency, AI-driven analytics enable accountants to assume consultative roles, providing management with deeper insights that support strategic decision-making (Vandapuye & Jabraoui, 2024). Complementing AI, big data analytics enhances predictive capabilities, allowing for the identification of patterns and risks that traditional accounting methods often overlook (Deliu & Olariu, 2024). These advances signify a paradigm shift, positioning accountants as integral contributors to organizational resilience and long-term value creation.

Parallel to AI, automation plays a critical role in reshaping accounting systems. The COVID-19 pandemic accelerated the adoption of automated solutions, compelling firms to adopt digital infrastructures to ensure operational continuity under restrictive conditions (Fülöp et al., 2024). Automation reduces reliance on human input for repetitive processes, enabling greater accuracy, speed, and standardization in financial reporting (Carvalho & Almeida, 2022). The transition from manual data entry toward automation allows accountants to focus on performance metrics, internal controls, and strategic management. Scholars argue that such changes elevate accountants from record-keepers to strategic business partners, reinforcing their role in value-added decision-making within organizations (Fülöp et al., 2024). Importantly, automation not only improves efficiency but also mitigates risks of human error, which have historically undermined the reliability of financial statements.

Blockchain technology further revolutionizes the field by introducing transparency, immutability, and real-time verification into financial transactions. Through decentralized ledgers, blockchain reduces opportunities for fraud and enhances audit reliability by providing permanent, tamper-proof records (Anh & Loi, 2025). Its capacity to facilitate real-time tracking of assets and obligations positions blockchain as a transformative tool for corporate governance and compliance. However, despite its potential, adoption rates remain uneven across regions, with developing economies facing barriers related to infrastructure and regulatory readiness (Anh & Loi, 2025). This uneven adoption highlights global disparities in technological integration and raises questions about the inclusivity of digital transformation in accounting practices worldwide. In developed economies, blockchain has already begun to reshape assurance processes, while in emerging markets its promise remains largely aspirational.

Statistical evidence supports the assertion that digital transformation in accounting is progressing at different speeds globally. Research indicates that adoption rates are significantly higher in North America and Europe compared to Southeast Asia and Africa, where insufficient digital literacy and infrastructural constraints impede rapid uptake (Herath & White, 2025). Organizations in high-income regions have shown greater capacity to integrate AI, automation, and blockchain, thereby improving efficiency and competitive advantage (AlNasrallah & Saleem, 2022). Conversely, firms in resource-constrained regions struggle to realize similar benefits, reinforcing global inequities in the technological trajectory of accounting (Hamdy et al., 2025). These divergences underscore the importance of contextualizing digital transformation within distinct regional and socioeconomic realities, as global convergence in accounting practices remains elusive.

Notwithstanding these advancements, digital transformation in accounting is fraught with challenges. Technological hurdles are significant, as the integration of new systems requires substantial financial investments and continuous upgrades. The complexity of existing infrastructures and lack of interoperability create inefficiencies, while blockchain adoption raises concerns about cybersecurity and data protection (Vărzaru, 2022; AlNasrallah & Saleem, 2022). Such challenges diminish the anticipated efficiency gains, creating barriers for organizations, particularly small and medium-sized enterprises (SMEs), that lack the capital and technical expertise for seamless implementation. Furthermore, organizational resistance to change—rooted in entrenched practices and uncertainty about new roles—compounds the difficulties of adoption (Ballesteros et al., 2024). The restructuring of workflows and roles can lead to ambiguity, undermining productivity during transitional phases (Matskiv et al., 2023).

Human factors present equally critical barriers. Traditional accounting professionals frequently lack the digital and analytical competencies required for effective engagement with AI, automation, and blockchain systems. This skills gap reflects inadequacies in accounting education and professional training programs, which have yet to align fully with the technological imperatives of the modern profession (Cunha et al., 2022). Without targeted reskilling initiatives, professionals risk obsolescence, and organizations face the danger of underutilizing costly digital systems. Ethical considerations further complicate matters: automated decision-making processes may lack contextual sensitivity, raising concerns about accountability, fairness, and professional judgment (Deliu & Olariu, 2024). As such, human adaptation remains as crucial as technological adoption in ensuring the sustainability of digital transformation.

Despite growing scholarship, significant gaps remain in the literature. Existing research frequently isolates specific technologies—AI, automation, or blockchain—without examining their combined effects on accounting systems (Hentati et al., 2025). This fragmented approach obscures the integrative dynamics of digital transformation. Moreover, the literature disproportionately focuses on large organizations in developed economies, neglecting SMEs and firms in emerging markets that encounter distinct constraints (Vărzaru, 2022). The long-term implications for professional roles, ethical frameworks, and educational curricula remain underexplored, further emphasizing the need for comprehensive, integrative reviews. Additionally, the ethical dimensions of digital transformation—particularly regarding algorithmic accountability and professional responsibility—demand more systematic investigation (Deliu & Olariu, 2024).

This narrative review seeks to address these gaps by synthesizing evidence on how AI, automation, and blockchain collectively shape accounting practices. The primary objective is to evaluate the transformative impact of these technologies on professional roles, organizational processes, and governance structures. By integrating insights from diverse contexts, the review aims to highlight both opportunities and risks, offering a balanced assessment of digital transformation's implications for the accounting profession. The analysis will focus on how technological adoption reconfigures workflows, reshapes professional competencies, and alters the ethical and governance frameworks of accounting systems.

The scope of this review encompasses global perspectives, with attention to regional disparities between developed and developing economies. Particular emphasis will be placed on how contextual factors—such as infrastructure, regulatory environments, and cultural attitudes—influence the trajectory of digital transformation. Additionally, industry-specific insights will be considered, acknowledging that sectors such as finance, healthcare, and SMEs face unique challenges and opportunities in adopting these technologies. By situating digital transformation within varied contexts, this review seeks to capture the complexity and heterogeneity of its impact on accounting, offering insights that are both academically rigorous and practically relevant.

METHOD

The methodology adopted for this review was designed to provide a comprehensive and reliable synthesis of scholarly work focusing on the integration of artificial intelligence (AI), automation, and blockchain within the accounting profession. Given the rapidly evolving nature of digital transformation and its multifaceted impact on accounting practices, the methodological framework prioritized breadth and rigor, ensuring that the selection of sources, search strategies, and screening procedures aligned with established academic standards for narrative and systematic reviews. This section explains in detail the databases consulted, the search strategies employed, the keywords and Boolean operators utilized, the inclusion and exclusion criteria adopted, the types of research considered, and the process through which literature was screened, evaluated, and incorporated into the review.

The first step in the methodological design involved the identification of appropriate academic databases. Considering the interdisciplinary character of digital transformation—which spans technology, management, and accounting—multiple databases were chosen to ensure a balanced coverage of technical, managerial, and professional accounting literature. Google Scholar was included for its extensive coverage across multiple disciplines, providing access to a wide variety of peer-reviewed journal articles, conference proceedings, and working papers. Scopus was selected for its comprehensiveness in the domains of business, management, and accounting, offering reliable access to high-quality peer-reviewed journals and conference papers. IEEE Xplore was used to source technical studies on AI, automation, and blockchain systems, particularly those originating in engineering and computer science. Emerald Insight provided targeted literature in management and accounting disciplines, especially those focusing on digital transformation and accounting innovations. Additionally, JSTOR was consulted to identify historical perspectives and theoretical contributions that contextualize the long-term evolution of

accounting systems. The combination of these databases enabled the capture of diverse perspectives and methodological approaches, thereby enriching the quality of the review.

A critical component of the search strategy was the use of carefully constructed keywords and Boolean operators. To ensure specificity and relevance, keywords were selected to capture core concepts of digital transformation and their application to accounting systems. Examples include "AI in accounting," "automation in accounting," "blockchain in financial reporting," "digital transformation in accounting," "accounting technologies," "accounting system automation," and "impact of AI on financial practices." Boolean operators were applied systematically to refine the search queries. The operator AND was used to link distinct concepts, such as in the search string "AI AND automation AND accounting," ensuring that retrieved studies addressed multiple dimensions simultaneously. OR was used to broaden the scope by including synonyms or related terms, such as "blockchain OR distributed ledger." The operator NOT was used sparingly to exclude irrelevant results, such as "accounting NOT taxation," in order to filter out articles not pertinent to the technological aspects of accounting. Quotation marks were applied to search for exact phrases, for instance, "digital transformation in accounting," thereby capturing studies that explicitly addressed the chosen topic. The combination of keywords and Boolean logic provided a structured and replicable search strategy, which is essential for academic rigor.

The review process further relied on explicit inclusion and exclusion criteria, which were developed based on prior systematic and narrative reviews. Inclusion criteria required that studies be published in peer-reviewed journals, ensuring the credibility and reliability of the evidence base. Only studies explicitly addressing digital transformation in the accounting profession, with a focus on AI, automation, or blockchain, were considered eligible. Preference was given to empirical research, as these studies provide data-driven insights into the impact of technological adoption. Additionally, only articles published in English were included to maintain consistency in comprehension and interpretation. Conversely, exclusion criteria were applied to filter out materials that did not meet the standards of academic rigor or topical relevance. Non-peer-reviewed sources, such as editorials, opinion pieces, and practitioner reports, were excluded. Studies focusing on technological innovations without direct application to accounting practices were removed from consideration. To ensure contemporary relevance, outdated studies published more than ten years prior to the search were excluded, given the rapid pace of technological advancement in the accounting domain. Furthermore, articles that did not situate their findings within an accounting context—such as those focused exclusively on general business technologies or unrelated financial systems—were deemed irrelevant and excluded.

The types of studies included in this review encompassed a range of research designs, reflecting the interdisciplinary nature of digital transformation. Empirical studies, including case studies, surveys, and cohort analyses, provided practical insights into the adoption and application of digital technologies in real-world accounting settings. Experimental studies, such as pilot projects on blockchain or AI-driven systems, were also included where available, as they shed light on the effectiveness and feasibility of emerging solutions. Narrative and systematic reviews were incorporated to provide contextual overviews and highlight key debates within the literature. Conceptual and theoretical papers, while not empirical in nature, were retained where they offered significant contributions to understanding the implications of digital transformation for accounting

practices, particularly regarding professional identity, governance, and ethics. This multi-method approach ensured that the review was comprehensive and inclusive of diverse forms of scholarly contribution.

The process of literature selection was conducted in multiple stages to ensure rigor and transparency. Initially, search results from the identified databases were exported into reference management software, which facilitated the removal of duplicate records. The first stage of screening involved a review of article titles and abstracts to assess preliminary relevance to the topic. Articles that failed to meet the inclusion criteria at this stage were excluded. The second stage involved a more detailed examination of full-text articles, where methodological quality, topical focus, and contribution to the objectives of the review were evaluated. Studies that lacked methodological rigor or failed to provide substantive insights into digital transformation in accounting were excluded at this stage. The final stage involved critical appraisal, where articles were assessed for reliability, validity, and alignment with the review objectives. In this stage, the credibility of the journal, the robustness of the research design, and the clarity of findings were considered. Only studies meeting these standards were incorporated into the synthesis.

The evaluation of articles also included attention to thematic saturation. Studies were organized according to the three technological dimensions central to the review: AI, automation, and blockchain. Within each dimension, articles were coded according to emergent themes, such as efficiency gains, professional identity, organizational culture, or governance implications. This coding process facilitated the identification of recurring patterns across studies and highlighted divergences in findings. Where possible, statistical results and empirical evidence were extracted to support thematic synthesis, particularly in relation to adoption rates, efficiency metrics, and regional comparisons. This thematic organization enabled a structured presentation of results, ensuring coherence between the review's methodology and its analytical framework.

In sum, the methodological approach employed in this review combined strategic database selection, carefully constructed search queries, explicit inclusion and exclusion criteria, and a multi-stage screening and evaluation process. This framework ensured that the resulting synthesis was comprehensive, credible, and contextually relevant. By employing rigorous methodological procedures, the review aimed to provide a balanced and integrative account of how AI, automation, and blockchain are transforming the accounting profession. The approach taken also ensures replicability, enabling future researchers to build upon the present study with similar methodological precision. Ultimately, this methodology serves as the foundation for a thorough and academically sound exploration of digital transformation in accounting, ensuring that the review contributes meaningfully to ongoing debates and scholarly advancements in the field.

RESULT AND DISCUSSION

AI in Accounting

Empirical research provides compelling evidence of the transformative impact of artificial intelligence (AI) on accounting practices, particularly in the areas of audit quality, efficiency, and cost reduction. Assidi et al. (2025) demonstrate that AI adoption results in a 75.7% improvement

in the functionality and responsibilities of accounting professionals, reflecting a substantial enhancement of audit capacity. These improvements stem largely from AI's ability to process vast datasets rapidly, enabling auditors to devote more attention to high-value tasks such as anomaly detection and fraud risk assessment (Abhishek et al., 2024). By automating repetitive and labor-intensive processes, AI minimizes manual errors while strengthening compliance through automated checks and alerts. The cumulative effect is an elevation in audit quality and efficiency, alongside significant reductions in costs associated with human labor (Alsharari & Ikem, 2023).

The integration of AI into auditing and accounting processes, however, reveals notable disparities across regions. In developed economies, including those in North America and Europe, robust infrastructure, higher technological literacy, and supportive regulatory frameworks facilitate the widespread adoption of AI tools in audit firms (Herath & White, 2025). These regions report higher acceptance rates, and firms are leveraging AI to conduct risk-based audits, predictive analysis, and real-time monitoring. Conversely, developing nations continue to face hurdles. Anh and Loi (2025) highlight the case of Vietnam, where AI adoption is still in its early phases. Barriers such as limited digital infrastructure, inadequate workforce skills, and fragmented regulatory systems hinder progress. This global disparity underscores the need for capacity building, both in terms of infrastructure and education, to enable equitable integration of AI across diverse regions.

Automation in Accounting

Automation is central to enhancing the accuracy, timeliness, and efficiency of financial reporting. Studies demonstrate that automated accounting systems reduce human error, standardize processes, and ensure greater data consistency (Hamdy et al., 2025). For instance, research by Fülbier and Sellhorn (2023) shows that automation facilitates the production of timely and accurate financial reports, significantly shortening report generation cycles. The resulting improvement in reporting timeliness supports managerial decision-making by providing financial insights in near real time. Abhishek et al. (2024) similarly observe that automation accelerates the financial close process, producing accurate statements faster and with fewer errors.

Despite its overall benefits, the influence of automation varies across organizational size. Large enterprises possess the financial and technical resources necessary to adopt advanced enterprise resource planning (ERP) systems, enabling full integration of automated accounting processes across departments (Vărzaru et al., 2023). These organizations benefit from seamless data flows, enhanced accuracy, and robust compliance mechanisms. In contrast, small and medium-sized enterprises (SMEs) often encounter resource constraints that hinder comprehensive automation. Nikiforov et al. (2023) and Kuzmenko et al. (2023) observe that while SMEs adopting automation experience improvements in operational efficiency, the scope of integration is limited compared to their larger counterparts. Nonetheless, the emergence of cloud-based accounting solutions provides SMEs with scalable, cost-effective alternatives, as noted by Hung et al. (2023). These developments indicate that automation is reshaping financial reporting practices across businesses of all sizes, albeit in varying degrees of depth and sophistication.

Blockchain in Accounting

Blockchain technology has emerged as a disruptive innovation in accounting, offering unprecedented levels of transparency, traceability, and data integrity. Izzo et al. (2021) demonstrate that blockchain facilitates real-time access to verified financial data, enhancing trust in financial reports and reducing risks of fraud. The technology's defining features—immutability and traceability—strengthen confidence in reported figures and provide auditors with reliable, tamper-proof records (Lino et al., 2021). These capabilities streamline verification processes, thereby increasing efficiency and reducing audit cycle times.

Matskiv et al. (2023) provide empirical evidence from Ukraine and Kazakhstan, demonstrating how blockchain implementation strengthens the trustworthiness of financial reporting. Their findings show that blockchain creates secure transaction environments, safeguarding data integrity across multiple stakeholders. Similarly, Gonçalves et al. (2022) find that blockchain integration into auditing improves transaction traceability and reduces audit cycle duration, facilitating compliance with regulatory standards and enhancing overall efficiency. These empirical findings collectively confirm blockchain's role as a transformative force in financial reporting and auditing.

Despite its potential, blockchain adoption differs widely across jurisdictions. In the European Union, where comprehensive regulatory frameworks support innovation, blockchain implementation in accounting is more advanced and accepted (Agrifoglio & Gennaro, 2022). These environments provide legal certainty and standardized practices that encourage broader adoption. Conversely, developing countries often encounter barriers such as insufficient legal structures, limited infrastructure, and governmental reluctance to embrace new technologies. Anh and Loi (2025) report that in Vietnam, blockchain adoption remains constrained by inadequate regulatory support and low technological literacy. These disparities highlight how regulatory readiness and institutional frameworks critically shape blockchain's adoption trajectory across regions.

Human Factors and Professional Adaptation

The digital transformation of accounting not only introduces technological innovations but also profoundly impacts the professional identity, skills, and adaptability of accountants. Vărzaru et al. (2022) and Gonçalves et al. (2022) emphasize that accountants are shifting from their traditional role as transaction recorders to becoming strategic advisors who interpret and analyze financial data through digital tools. This evolution redefines professional identity and underscores the need for enhanced competencies in data analytics, AI management, and digital strategy.

The requirement for continuous education and reskilling is central to this transformation. Deliu and Olariu (2024) argue that digital transformation necessitates new competencies in technological management and analytical reasoning. Professionals who proactively pursue these skills are more likely to adapt successfully to emerging roles, while those who do not risk obsolescence. This transition highlights the growing importance of aligning accounting curricula and professional training with technological realities to ensure that accountants are equipped for the demands of the digital age.

Demographic factors, particularly age and gender, significantly influence adaptation to digital transformation. Chen et al. (2022) report that younger professionals are more receptive to digital technologies, owing to their greater familiarity and comfort with digital tools. Older professionals, by contrast, may perceive these changes as disruptive, creating a generational gap in digital readiness. Gender disparities are also evident. Mingaleva and Shironina (2021) observe that women often face additional barriers in adopting digital tools, partly due to gender biases in technology-related training and limited representation in technologically intensive roles. Addressing these disparities through targeted initiatives and inclusive training programs can enhance overall professional readiness and foster equitable adaptation.

Global Perspectives and Comparative Insights

The literature consistently demonstrates that the trajectory of digital transformation in accounting is uneven across global contexts. Developed regions, with their advanced infrastructures and supportive policy frameworks, exhibit faster adoption of AI, automation, and blockchain (Herath & White, 2025). These contexts enable organizations to harness efficiencies and competitive advantages, reinforcing global leadership in accounting innovation. Developing regions, however, face structural limitations such as inadequate technological infrastructure, low levels of digital literacy, and limited financial resources (Hamdy et al., 2025). These barriers slow the pace of adoption and exacerbate global inequalities in professional development and organizational competitiveness.

Comparative evidence illustrates how socio-economic and institutional contexts mediate the effectiveness of technological integration. For example, while European firms adopt AI and blockchain to enhance regulatory compliance and stakeholder trust, Vietnamese enterprises struggle with fragmented legal frameworks and insufficient resources (Anh & Loi, 2025). Similarly, SMEs in resource-constrained regions may rely on cloud-based automation tools as an accessible alternative, whereas large firms in advanced economies deploy fully integrated ERP systems (Hung et al., 2023). These comparative insights underscore that digital transformation is not a uniform phenomenon but a multifaceted process shaped by regional disparities, organizational capacity, and human adaptability.

Synthesis of Findings

Taken together, the results of this narrative review highlight the multifaceted nature of digital transformation in accounting. AI enhances audit quality, reduces costs, and increases efficiency, though its adoption is uneven across regions. Automation improves the accuracy and timeliness of financial reporting, with larger firms realizing more extensive benefits compared to SMEs, though cloud-based solutions are gradually narrowing this gap. Blockchain fosters transparency, data integrity, and trust in financial reporting, but its uptake is highly contingent on regulatory and infrastructural readiness. Importantly, these technological transformations are not purely technical but profoundly influence the professional identity, skills, and adaptability of accountants.

Demographic factors further shape this adaptation, creating generational and gender-related disparities in readiness.

The global comparison underscores that while digital transformation promises substantial benefits, these are unevenly distributed. Developed economies stand at the forefront, while developing countries face systemic barriers that hinder integration. Addressing these gaps requires targeted policy interventions, capacity building, and inclusive educational initiatives to ensure that the benefits of digital transformation in accounting are equitably realized. Ultimately, these findings reinforce the argument that technological, organizational, and human dimensions must be considered jointly to understand and navigate the complexities of digital transformation in the accounting profession.

The findings of this review underscore the pivotal role of systemic factors in shaping the outcomes of digital transformation within the accounting profession. Organizational culture, regulatory frameworks, and technological infrastructure collectively influence the extent to which AI, automation, and blockchain are successfully integrated into accounting practices. While the empirical evidence highlights the potential of these technologies to enhance audit quality, reduce costs, and foster transparency, systemic constraints often determine whether these benefits are fully realized. This discussion contextualizes the results within existing literature, examines systemic influences, and explores strategies that have been proposed or implemented to overcome barriers. Furthermore, it highlights limitations in the current body of research and proposes directions for future inquiry.

Organizational culture remains a decisive element in the successful implementation of digital technologies. As Hasan et al. (2025) note, organizations that cultivate a supportive culture encouraging innovation and openness to change tend to achieve greater success in adopting AI and automation. A culture that rewards experimentation and continuous learning provides fertile ground for employees to adapt to new systems, thereby maximizing the potential of digital tools. Conversely, resistant organizational cultures characterized by skepticism or entrenched adherence to traditional practices impede adoption. Ballesteros et al. (2024) further argue that organizational resistance to change often leads to underutilization of advanced technologies, reducing the efficiency gains that digital transformation is designed to deliver. These findings align with broader research in management studies suggesting that cultural inertia is a recurring barrier to innovation. Hence, fostering a culture of adaptability and digital literacy within firms emerges as a key enabler of technological integration.

Regulatory frameworks similarly exert a significant influence on digital transformation trajectories. Alnasrallah and Saleem (2022) demonstrate that jurisdictions with robust and transparent regulations concerning data protection, cybersecurity, and digital infrastructure exhibit higher adoption rates of accounting technologies. The European Union, with its well-developed regulatory guidelines, provides a case in point, where blockchain adoption in financial reporting is advancing under a supportive legal environment (Agrifoglio & Gennaro, 2022). In contrast, regions lacking clear or flexible regulatory frameworks often experience hesitancy among firms to invest in digital systems, given uncertainties around compliance obligations. Anh and Loi (2025) highlight the Vietnamese context, where the absence of comprehensive digital policies constrains

blockchain implementation in accounting. These disparities illustrate how regulation serves not only as a facilitator of trust but also as a determinant of competitive advantage. Without regulatory clarity, even technologically capable firms may delay or avoid digital adoption altogether.

The importance of technological infrastructure as a systemic factor cannot be overstated. Hamdy et al. (2025) emphasize that regions with advanced IT infrastructure—comprising high-speed internet, reliable data centers, and skilled IT personnel—are more successful in harnessing AI, automation, and blockchain for accounting purposes. In resource-constrained settings, however, organizations frequently struggle with limited hardware and software capacity, undermining their ability to fully leverage digital tools. Herath and White (2025) show that firms in North America and Europe benefit from strong infrastructures that enable seamless integration of AI-driven audit systems, whereas firms in Southeast Asia and Africa face persistent technological challenges. These infrastructural disparities contribute to a global digital divide, reinforcing inequalities in accounting capabilities and professional competitiveness.

Strategies to overcome these barriers have been proposed and implemented with varying degrees of success. Government support and incentives play a vital role in motivating organizations, particularly SMEs, to engage in digital transformation. Gonçalves et al. (2022) suggest that subsidies, tax reliefs, or technological grants provided by governments can lower the entry costs of adopting AI or automation systems. Such interventions not only reduce financial barriers but also signal institutional support, encouraging organizations to align with broader national strategies of digital innovation. This policy-driven approach has shown success in developed economies, but its absence in many developing regions exacerbates adoption disparities.

Equally significant is the role of training and education in bridging skills gaps within the accounting workforce. Cunha et al. (2022) emphasize that continuous professional development and structured training programs are essential for equipping accountants with the digital and analytical competencies demanded by AI and automation. Without such training, firms risk underutilizing expensive technological investments due to human resource inadequacies. Deliu and Olariu (2024) extend this argument by highlighting the importance of embedding digital competencies into accounting curricula, ensuring that future professionals are adequately prepared for digital environments. These findings reinforce the notion that digital transformation is not solely a technological shift but also a human capital challenge requiring deliberate investment in reskilling.

Collaboration with technology providers offers another avenue for overcoming adoption barriers. Marshall and Lambert (2018) show how cloud-based accounting solutions reduce upfront infrastructure costs, making automation and AI more accessible to SMEs. Partnerships with technology firms enable organizations to access cutting-edge innovations while minimizing risks associated with self-directed implementation. This approach also fosters knowledge transfer, allowing accounting professionals to learn directly from technology experts, thereby accelerating the assimilation of digital tools. Such collaborations are increasingly relevant in contexts where internal expertise or financial capacity is limited.

Despite growing literature, several limitations constrain the current understanding of digital transformation in accounting. A notable gap lies in the fragmented focus of research, where studies often investigate AI, automation, or blockchain in isolation. Hentati et al. (2025) argue that this

compartmentalization obscures the interdependencies between technologies, preventing a holistic appreciation of their collective impact on accounting systems. Future research should prioritize integrative approaches that examine how these technologies interact to reconfigure accounting practices.

Another limitation pertains to the geographical distribution of research. Much of the existing evidence is drawn from developed economies, with limited attention paid to developing regions where infrastructural, cultural, and regulatory challenges differ significantly. Nguyen et al. (2024) highlight the case of SMEs in Vietnam, where cultural resistance and resource scarcity constrain digital adoption. Addressing this imbalance requires research that not only documents the barriers in emerging markets but also identifies locally tailored solutions. Comparative studies that contrast experiences across contexts could illuminate best practices adaptable to diverse environments.

An additional underexplored area concerns the impact of digital transformation on professional identity. Vărzaru (2022) and Matskiv et al. (2023) suggest that the shift from traditional roles to technology-oriented functions may cause role ambiguity and psychological strain among accountants. However, systematic empirical studies on how digital transformation affects job satisfaction, career trajectories, and professional well-being remain scarce. Lino et al. (2021) emphasize the need to understand the ethical implications of AI and automation in accounting, particularly with respect to accountability and professional judgment. This calls for future research into the psychosocial dimensions of digital change, including the intersection of technology, identity, and ethics within the profession.

In examining potential solutions, the alignment of systemic factors emerges as a central theme. For digital transformation in accounting to succeed, organizational culture must encourage openness to innovation, regulatory frameworks must provide clarity and protection, and technological infrastructure must be sufficiently advanced to support adoption. These three dimensions are interdependent: a supportive culture is undermined without adequate infrastructure, while robust infrastructure is underutilized without regulatory clarity. Addressing challenges requires coordinated action across organizational, governmental, and educational stakeholders, ensuring that technology adoption is sustainable and equitable.

Taken together, the literature reviewed here suggests that digital transformation in accounting is a multifaceted phenomenon shaped as much by systemic contexts as by technological innovations themselves. The barriers and opportunities are deeply embedded in organizational practices, regulatory systems, and infrastructural capabilities. By identifying these factors and exploring potential strategies for overcoming them, this discussion contributes to a nuanced understanding of the complexities involved in integrating AI, automation, and blockchain into accounting practices. Future scholarship must build on these insights by broadening geographical coverage, integrating multiple technological dimensions, and paying closer attention to the human and ethical implications of digital change.

CONCLUSION

This review demonstrates that digital transformation in accounting, driven by artificial intelligence, automation, and blockchain, is reshaping the profession globally by enhancing audit quality, improving financial reporting, and reinforcing transparency. The results reveal that AI contributes to efficiency and cost reduction by automating repetitive tasks and enabling predictive analytics, while automation enhances reporting accuracy and timeliness, particularly in large organizations with advanced ERP systems. Blockchain further strengthens transparency and data integrity through immutable transaction records, though its adoption remains uneven due to regulatory and infrastructural disparities. These technologies collectively redefine the role of accountants from traditional record-keepers to strategic advisors, necessitating new competencies and ongoing professional development. However, systemic challenges such as resistant organizational cultures, fragmented regulatory frameworks, and weak technological infrastructures continue to impede widespread adoption. The discussion highlights that coordinated strategies—including supportive policies, government incentives, workforce training, and collaboration with technology providers—are crucial for overcoming these barriers. The findings also identify significant research gaps, particularly the lack of integrative studies examining these technologies together, the limited focus on emerging markets, and insufficient exploration of professional identity and ethical dimensions. Future research should adopt a holistic perspective, broaden geographic coverage, and explore human and ethical implications in greater depth. Addressing these gaps is essential to ensure equitable and sustainable digital transformation in accounting, enabling the profession to thrive in an increasingly technology-driven global environment.

REFERENCE

Abhishek, N., Suraj, N., Rahiman, H., Nawaz, N., Kodikal, R., Kulal, A., … & Raj, K. (2024). Digital transformation in accounting: elevating effectiveness across accounting, auditing, reporting and regulatory compliance. *Journal of Accounting & Organizational Change*. https://doi.org/10.1108/jaoc-01-2024-0039

Agrifoglio, R. and Gennaro, D. (2022). New ways of working through emerging technologies: a meta-synthesis of the adoption of blockchain in the accountancy domain. *Journal of Theoretical and Applied Electronic Commerce Research, 17*(2), 836-850. https://doi.org/10.3390/jtaer17020043

Al-Okaily, M., Alsmadi, A., Alrawashdeh, N., Al-Okaily, A., Oroud, Y., & Al-Gasaymeh, A. (2023). The role of digital accounting transformation in the banking industry sector: an integrated model. *Journal of Financial Reporting and Accounting, 22*(2), 308-326. https://doi.org/10.1108/jfra-04-2023-0214

Alsharari, N. and Ikem, F. (2023). Digital accounting systems and information technology in the public sector: mutual interaction. *Journal of Systems and Information Technology, 25*(1), 53-73. https://doi.org/10.1108/jsit-09-2021-0190

AlNasrallah, W. and Saleem, F. (2022). Determinants of the digitalization of accounting in an emerging market: the roles of organizational support and job relevance. *Sustainability, 14*(11), 6483. https://doi.org/10.3390/su14116483

Anh, D. and Loi, N. (2025). Blockchain and the future of sustainable corporate accounting: a behavioral perspective from Vietnam's manufacturing industry. *Sustainability, 17*(10), 4658. https://doi.org/10.3390/su17104658

Assidi, S., Omran, M., Rana, T., & Borgi, H. (2025). The role of AI adoption in transforming the accounting profession: a diffusion of innovations theory approach. *Journal of Accounting & Organizational Change*. https://doi.org/10.1108/jaoc-04-2024-0124

Ballesteros, M., Sánchez, S., Peña, M., More, J., Farroñán, W., Altamirano, J., … & Ninaquispe, J. (2024). Accounting systematization in commercial enterprises: a literature review. *Journal of Educational and Social Research, 14*(2), 115. https://doi.org/10.36941/jesr-2024-0031

Carvalho, C. and Almeida, A. (2022). The adequacy of accounting education in the development of transversal skills needed to meet market demands. *Sustainability, 14*(10), 5755. https://doi.org/10.3390/su14105755

Chen, W., Cai, W., Hu, Y., Zhang, Y., & Yu, Q. (2022). Gimmick or revolution: can corporate digital transformation improve accounting information quality? *International Journal of Emerging Markets, 19*(10), 2966-2990. https://doi.org/10.1108/ijoem-04-2022-0572

Coman, D., Ionescu, C., Duică, A., Coman, M., Uzlău, M., Stănescu, S., … & State, V. (2022). Digitization of accounting: the premise of the paradigm shift of role of the professional accountant. *Applied Sciences, 12*(7), 3359. https://doi.org/10.3390/app12073359

Cunha, T., Martins, H., Carvalho, A., & Carmo, C. (2022). Not practicing what you preach: how is accounting higher education preparing the future of accounting. *Education Sciences, 12*(7), 432. https://doi.org/10.3390/educsci12070432

Deliu, D. and Olariu, A. (2024). The role of artificial intelligence and big data analytics in shaping the future of professions in industry 6.0: perspectives from an emerging market. *Electronics, 13*(24), 4983. https://doi.org/10.3390/electronics13244983

Fülbier, R. and Sellhorn, T. (2023). Understanding and improving the language of business: how accounting and corporate reporting research can better serve business and society. *Journal of Business Economics, 93*(6-7), 1089-1124. https://doi.org/10.1007/s11573-023-01158-4

Fülöp, M., Ionescu, C., Măgdaş, N., Topor, D., & Breaz, T. (2024). Acceptance of digital instruments in the accounting profession. *Journal of East European Management Studies, 29*(2), 283-313. https://doi.org/10.5771/0949-6181-2024-2-283

Gonçalves, M., Silva, A., & Ferreira, C. (2022). The future of accounting: how will digital transformation impact the sector? *Informatics, 9*(1), 19. https://doi.org/10.3390/informatics9010019

Hamdy, A., Diab, A., & Eissa, A. (2025). Digital transformation and the quality of accounting information systems in the public sector: evidence from developing countries. *International Journal of Financial Studies, 13*(1), 30. https://doi.org/10.3390/ijfs13010030

Hasan, E., Alzuod, M., Jasimee, K., Alshdaifat, S., Hijazin, A., & Khrais, L. (2025). The role of organizational culture in digital transformation and modern accounting practices among Jordanian SMEs. *Journal of Risk and Financial Management, 18*(3), 147. https://doi.org/10.3390/jrfm18030147

Hentati, H., Azouz, S., & Taktak, N. (2025). The digitalization of accounting firms: anticipating pre- and post-implementation technological risks. *African Journal of Economic and Management Studies*. https://doi.org/10.1108/ajems-08-2024-0453

Hentati, H., Jardak, M., & Boulila, N. (2025). The impact of contingency factors on the degree of digitization and the operational performance in accounting firms. *Journal of Accounting & Organizational Change*. https://doi.org/10.1108/jaoc-06-2024-0188

Herath, S. and White, S. (2025). Digital transformation and the future of accounting., 1-34. https://doi.org/10.4018/979-8-3693-9440-3.ch001

Hung, B., Tran, H., Hoai, T., & Nguyen, N. (2023). Advancement of cloud-based accounting effectiveness, decision-making quality, and firm performance through digital transformation and digital leadership: empirical evidence from Vietnam. *Heliyon, 9*(6), e16929. https://doi.org/10.1016/j.heliyon.2023.e16929

Izzo, M., Fasan, M., & Tiscini, R. (2021). The role of digital transformation in enabling continuous accounting and the effects on intellectual capital: the case of Oracle. *Meditari Accountancy Research, 30*(4), 1007-1026. https://doi.org/10.1108/medar-02-2021-1212

Kuzmenko, H., Zakharkina, L., Tranchenko, O., Галенко, О., Chuba, N., Petrenko, N., … & Kravchenko, V. (2023). Implementation of information technologies in the international accounting system of fuel and energy sector enterprises. *E3S Web of Conferences, 408*, 01022. https://doi.org/10.1051/e3sconf/202340801022

Lino, A., Aquino, A., & Neves, F. (2021). Accountants' postures under compulsory digital transformation imposed by government oversight authorities. *Financial Accountability and Management, 38*(2), 202-222. https://doi.org/10.1111/faam.12313

Marshall, T. and Lambert, S. (2018). Cloud-based intelligent accounting applications: accounting task automation using IBM Watson cognitive computing. *Journal of Emerging Technologies in Accounting, 15*(1), 199-215. https://doi.org/10.2308/jeta-52095

Matskiv, H., Smirnova, N., Малікова, А., Пугаченко, О., & Dubinina, M. (2023). Застосування технології блокчейн у бухгалтерському обліку та аудиті: досвід україни та казахстану. *Financial and Credit Activity Problems of Theory and Practice, 1*(48), 180-192. https://doi.org/10.55643/fcaptp.1.48.2023.3955

Mingaleva, Z. and Shironina, E. (2021). Gender aspects of digital workplace transformation. *JWEE, (1-2)*, 1-17. https://doi.org/10.28934/jwee21.12.pp1-17

Nguyen, T. and Dan, N. (2025). Integrating strategic management accounting with risk management in the digital transformation period to improving business performance at import-export companies. *International Journal of Innovative Research and Scientific Studies, 8*(2), 4412-4423. https://doi.org/10.53894/ijirss.v8i2.6374

Nguyen, T., Le-Anh, T., Hong, N., Nguyen, L., & Mai, X. (2024). Digital transformation in accounting of Vietnamese small and medium enterprises. *Journal of Financial Reporting and Accounting, 23*(2), 769-787. https://doi.org/10.1108/jfra-12-2023-0761

Petropoulou, A., Angelaki, E., Rompogiannakis, I., Passas, I., Garefalakis, A., & Thanasas, G. (2024). Digital transformation in SMEs: pre- and post-COVID-19 era: a comparative bibliometric analysis. *Sustainability, 16*(23), 10536. https://doi.org/10.3390/su162310536

Pinheiro, R. and Almeida, M. (2025). Digital transformation for healthcare accounting., 201-236. https://doi.org/10.4018/979-8-3693-9251-5.ch006

Vandapuye, S. and Jabraoui, S. (2024). Revolutionizing tomorrow: the role of artificial intelligence in the accounting profession. *Salud Ciencia Y Tecnología - Serie De Conferencias, 3*, 1015. https://doi.org/10.56294/sctconf20241015

Vărzaru, A. (2022). An empirical framework for assessment of the effects of digital technologies on sustainability accounting and reporting in the European Union. *Electronics, 11*(22), 3812. https://doi.org/10.3390/electronics11223812

Vărzaru, A., Bocean, C., Criveanu, M., Budică-Iacob, A., & Popescu, D. (2023). Assessing the contribution of managerial accounting in sustainable organizational development in the healthcare industry. *International Journal of Environmental Research and Public Health, 20*(4), 2895. https://doi.org/10.3390/ijerph20042895