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Systematic Review

Digital Competencies for a FinTech-Driven Accounting Profession: A Systematic Literature Review

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Abstract

Financial Technology (FinTech) is fundamentally reshaping the accounting profession, accelerating the shift from routine transactional activities to more strategic, data-driven functions. This transformation demands advanced digital competencies, yet the scholarly understanding of these skills remains fragmented. To provide conceptual and analytical clarity, this study defines FinTech as an ecosystem of enabling technologies, including artificial intelligence, data analytics, and blockchain, that collectively drive this professional transition. Addressing the lack of systematic synthesis, the study employs a systematic literature review (SLR) guided by the PRISMA 2020 framework, complemented by bibliometric analysis, to map the intellectual landscape. The review focuses on peer-reviewed journal articles published between January 2020 and June 2025, thereby capturing the accelerated digital transformation of the post-pandemic era. The analysis identifies four dominant thematic clusters: (1) the professional context and digital transformation; (2) the educational response and curriculum development; (3) core competencies and their technological drivers; and (4) ethical judgement and professional responsibilities. Synthesising these themes reveals critical research gaps in faculty readiness, curriculum integration, ethical governance, and the empirical validation of institutional strategies. By offering a structured map of the field, this review contributes actionable insights for educators, professional bodies, and firms, and advances a forward-looking research agenda to align professional readiness with the realities of the FinTech era.

Keywords: FinTech; digital competencies; accounting profession; systematic literature review

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1. Introduction

COVID-19 has accelerated the evolution of Financial Technology (FinTech), positioning it as a transformative force within the financial and professional services sectors. The pandemic acted as a catalyst for the rapid digitalization of transactions, prompting both consumers and organisations to adopt online payment, investment, and accounting platforms. FinTech has enabled faster, more efficient, and inclusive service delivery through the integration of digital innovations such as artificial intelligence, data analytics, and blockchain technologies [1]. Over the past decade, these innovations have advanced through three major developmental waves—electronic payment systems, distributed ledger technologies, and AI-driven personalization and analytics [2]. Collectively, they have not only disrupted

conventional financial operations but also reshaped business models and competitive dynamics across global markets. The comprehensive review by Ha, Le and Nguyen [2] identifies FinTech as a catalyst for financial inclusion, particularly across different market contexts. Their analysis, based on 96 high-quality journal articles, highlights three dominant research clusters: the emergence of innovative services such as mobile money, crowdfunding, and P2P lending; structural transformations in the financial landscape through efficiency gains and digital infrastructure; and the evolving roles of stakeholders—including regulators, technology providers, and educators—in shaping an inclusive FinTech ecosystem. Despite its breadth, their review notes an important limitation: insufficient attention has been paid to how FinTech alters professional roles, particularly in accounting, and the competencies required to navigate these changes effectively.

To provide a clear analytical focus, the present study conceptualises FinTech not as a monolithic entity, but as the ecosystem of enabling technologies transforming professional practice. This includes, but is not limited to, artificial intelligence (AI), data analytics, blockchain, and robotic process automation (RPA), which collectively drive the architectural shifts at the core of this investigation.

The accounting profession, long grounded in the principles of financial reporting, auditing, and regulatory compliance, is undergoing profound technological transformation. Advances such as cloud-based accounting systems, blockchain-enabled audits, and AI-driven risk assessments are increasingly embedded within the daily operations of accountants, shifting the profession away from purely transactional tasks toward more analytical and strategic responsibilities. This evolution necessitates the development of new digital competencies that extend beyond basic ICT literacy. Contemporary accounting professionals are now expected to demonstrate fluency in data analytics, an understanding of cybersecurity risks, proficiency in automated systems, and sound ethical judgement in digital decision-making [3]. These competencies are critical for adapting to FinTech-integrated environments, where rapid technological change demands both flexibility and continuous professional learning.

The urgency of these shifts has been dramatically intensified by the COVID-19 pandemic. Beginning in 2020, the pandemic catalysed a rapid adoption of remote auditing, virtual collaboration, cloud-based accounting systems, and technology-enabled assurance. For many organisations, this period marked a structural turning point that accelerated the digitalisation of accounting functions. As a result, the years from 2020 onwards provide a distinctive context in which digital competencies became not merely advantageous but essential for professional survival and advancement. Focusing on this post-pandemic acceleration allows for a timely examination of how scholarship has addressed digital competencies in accounting during a critical phase of professional restructuring.

Although the literature has increasingly acknowledged the intersection between FinTech and workforce transformation, systematic investigations into the digital upskilling of accounting professionals remain scarce. Existing reviews of FinTech and digital transformation predominantly concentrate on banking, consumer adoption, or regulatory innovation, while reviews focusing explicitly on accounting often adopt pre-pandemic timeframes that limit their relevance to contemporary realities. For instance, Socoliuc [4] highlights the need for accounting professionals to adapt to emerging technologies brought about by digitalization, emphasising the necessity for both young and experienced accountants to acquire new skills in response to evolving demands within the profession. Additionally, findings underscore the broader implications of digitalization on career trajectories, indicating an urgent need for individuals in the accounting field to engage with new technologies to maintain their professional relevance [4].

Consequently, there remains no comprehensive synthesis of the literature that maps the competencies accountants require in FinTech-integrated environments and analyses how these competencies are conceptualised, taught, and applied in practice [2]. The findings from Yigitbasioglu, et al. [5] further this discourse, demonstrating that contemporary accountants in public service firms operate at the confluence of digital transformation and advisory roles, where their skillsets need realignment with rapidly changing technological demands. Moreover, Andreassen [6] suggests that misalignment of roles due to competition among professionals responding to technological advancements could hinder effective adaptation within the profession. This gap is particularly pressing for educators, regulators, and professional bodies seeking to prepare accountants for a rapidly digitalizing profession. The evidence suggests that failure to address these gaps may lead to a skills shortage in the accounting workforce, ultimately affecting the industry's ability to innovate and compete in an increasingly digital economy [5,6].

To address this lacuna, the present study conducts a systematic literature review (SLR), guided by the PRISMA 2020 framework, to provide a structured synthesis of peer-reviewed journal articles and review papers published between 1 January 2020 and 30 June 2025. The review pursues three objectives: first, to identify and categorise the digital competencies emphasised in accounting research within the FinTech era; second, to examine how these competencies have been conceptualised and framed in the literature; and third, to synthesise the barriers and institutional responses highlighted in scholarly work. By offering a comprehensive mapping of the scholarly landscape, this review contributes an evidence-based understanding of the digital competencies that define the contemporary accounting profession, bridging academic insights with urgent professional needs on a global scale.

The remainder of this paper is structured as follows. Section 2 establishes the theoretical background on FinTech's impact on the accounting profession and situates this study within the existing body of literature. Section 3 outlines the methodology, detailing the systematic review process guided by the PRISMA 2020 framework and the bibliometric techniques employed [7]. Section 4 presents the results, beginning with a descriptive overview of the field and followed by a thematic content analysis of the identified research clusters. Section 5 discusses the key findings, their theoretical and practical implications, and the research gaps that emerge from the analysis. Finally, Section 6 concludes the paper by summarising its contributions and proposing a forward-looking research agenda.

2. Theoretical Background

2.1. The Architectural Shift Driven by Financial Technology

The advent of Financial Technology (FinTech) has initiated a period of profound structural change, driven by a core ecosystem of enabling technologies. To fully appreciate the resulting pressure on the accounting profession, one must first understand these technological drivers that collectively constitute the FinTech revolution [8]. This movement is fundamentally reconfiguring how financial services are delivered, replacing traditional, centralised models with more dynamic, efficient, and often decentralised alternatives. The impact of this shift is global, offering new pathways to overcome historical barriers to financial access and efficiency [9]. To fully appreciate the resulting pressure on the accounting profession, one must first understand the core technologies driving this transformation.

Key Enabling Technologies.

Intelligence (AI) and Machine Learning (ML): Artificial Intelligence (AI) and Machine Learning (ML): AI and ML are embedding cognitive capabilities into core accounting workflows. By processing immense volumes of historical and live data, these technologies enable sophisticated predictive modelling, improve the detection of financial irregularities,

and support auditors' professional judgement in ambiguous situations [10]. This transforms the assurance function from a historical check into a forward-looking analysis of risk and opportunity.

Robotic Process Automation (RPA): Functioning as a key instrument of digitalization, RPA is designed to handle structured, high-volume operational work like processing transactions, reconciling accounts, and preparing standardised reports [11]. By unburdening accountants from such routine tasks, RPA creates the capacity for them to engage in more complex analytical and strategic advisory work, thereby elevating the contribution of the accounting function.

Blockchain and Distributed Ledger Technology (DLT): A primary contribution of blockchain technology is the novel mechanism it provides for guaranteeing the integrity of financial data. Through the use of a shared and cryptographically secured ledger, every transaction is rendered effectively immutable once recorded. This system fosters a high degree of confidence in financial records without necessitating traditional third-party validation [12]. Its use not only allows for highly secure record-keeping but also enables smart contracts, which are programmed to execute automatically once certain conditions are fulfilled, thus promising to streamline compliance and reduce verification overhead.

Big Data Analytics and Data Visualisation: The modern economy produces an immense volume and variety of data. The ability to manage and interpret these large, often unstructured, datasets is becoming a critical business function. For accountants, big data analytics provides the tools to look past statutory reporting requirements and generate deep, predictive insights for the business [13]. When combined with effective data visualisation, these insights can be communicated clearly through interactive dashboards, making complex financial information accessible and actionable for strategic leadership.

2.2. The Reorientation of the Accounting Professional

The integration of these powerful technologies is compelling a significant reorientation of the accounting profession's core identity. The long-standing perception of the accountant as a custodian of past records and a compliance officer gives way to a more proactive and influential role. In this evolving landscape, professionals are increasingly called upon to serve as strategic partners and data interpreters who use technology to create and sustain organisational value [14].

Impact on Core Accounting Functions

Auditing: The practice of auditing is shifting from its traditional model of periodic, sample-based checks to a paradigm of continuous assurance. Supported by AI, auditors can now analyse entire populations of transactions in near real-time, allowing them to identify and address anomalies proactively. This moves the audit's emphasis from post-event detection towards ongoing risk mitigation [15].

Financial Reporting: The reporting cycle is becoming highly streamlined through automation, permitting the creation of financial reports on demand. Consequently, the central professional challenge is no longer the manual compilation of data but rather the governance and quality control of information drawn from numerous integrated systems. The accountant must now act as a data architect, ensuring the reliability of automated outputs to maintain stakeholder confidence [12].

Managerial Accounting: The use of predictive analytics is converting static annual budgets and forecasts into fluid, rolling models. By simulating different business and economic scenarios, accountants can offer leadership more realistic and adaptable financial guidance. This deepens the integration of the finance function into the heart of strategic corporate decision-making [16].

2.3. Digital Competence as a Form of Professional Capital

To operate effectively in this transformed environment, accountants require a new and sophisticated suite of skills. The perspective of Human Capital Theory is useful here, as it considers education and skill acquisition as investments that build an individual's productive capacity [8]. Seen through this lens, digital competencies are vital forms of modern professional capital. Such competence is a composite of (1) technical fluency with new digital tools, (2) advanced analytical capacity for critical data interpretation, and (3) a well-developed socio-ethical intelligence covering data governance, privacy, and digital security [17].

A consensus regarding the necessary composition of this new professional capital is emerging from the world's leading standard-setting bodies. For instance, guidance from the International Federation of Accountants (IFAC) underscores the critical importance of data analytics capabilities and advanced digital literacy [18]. Similarly, competency blueprints published by organisations such as the AICPA and ACCA articulate a vision for the future accountant that synthesises technological fluency with strategic insight and ethical fortitude. These authoritative frameworks provide an invaluable benchmark for the present review, offering established taxonomies to classify the range of skills identified within academic research.

2.4. The Role of Professional Bodies and Regulatory Frameworks

The integration of FinTech into accounting is not occurring in a vacuum; it is shaped by a global ecosystem of professional standard-setting bodies and diverse regulatory environments. These institutions play a critical role in defining competency requirements, guiding educational curricula, and establishing the ethical guardrails for technology adoption.

Professional accounting bodies, such as the International Federation of Accountants (IFAC), the Association of International Certified Professional Accountants (AICPA), and the Association of Chartered Certified Accountants (ACCA), have been proactive in addressing the digital transformation. They have developed comprehensive competency frameworks that integrate data analytics, cybersecurity awareness, and systems thinking into the core knowledge base expected of accountants [18]. These frameworks serve as a global benchmark, influencing university accounting programmes and continuing professional development (CPD) requirements. By setting these standards, professional bodies aim to ensure that the skills of accountants remain relevant and that the profession can continue to uphold its commitment to public trust and ethical conduct in a digital age.

Simultaneously, the regulatory landscape is evolving, presenting both challenges and opportunities. Data governance and privacy have become paramount concerns, with regulations like the European Union's General Data Protection Regulation (GDPR) setting a high standard for how organisations handle personal and financial data. Accountants must now possess a strong understanding of these legal frameworks to ensure compliance and manage data-related risks [19]. Furthermore, the rise in technologies like blockchain and cryptocurrencies introduces new regulatory complexities related to asset valuation, taxation, and financial reporting. The global nature of these technologies means that accountants must navigate a patchwork of national and international regulations, demanding a new level of regulatory literacy [20]. This interplay between professional standards and evolving legal requirements is a key driver shaping the specific digital competencies required of the modern accountant.

3. Methodology

To ensure methodological rigour, transparency, and replicability, this study adopts a systematic literature review grounded in the PRISMA 2020 protocol [7]. The approach

was designed to synthesise recent peer-reviewed literature addressing digital competencies required within the accounting profession in FinTech-integrated environments. Given the intensified pace of digital transformation following the COVID-19 pandemic, the review focused exclusively on studies published between January 2020 and June 2025. This timeframe captures the most relevant and policy-responsive developments in professional competencies, educational frameworks, and institutional readiness in response to FinTech disruption.

3.1. Review Protocol and Research Design

The review protocol followed the three-stage process proposed by Tranfield, et al. [21], involving: (1) planning the review, including the development of the search strategy and eligibility criteria; (2) conducting the review through the identification, screening, and selection of relevant studies; and (3) synthesising and reporting the findings. The PRISMA 2020 flow diagram was employed to document the systematic selection process, thereby ensuring transparency and reproducibility. The review was guided by the following research questions:

RQ1: *What digital competencies are considered essential for accounting professionals in FinTech-integrated environments?*

RQ2: *How are these competencies conceptualised or framed in the literature?*

RQ3: *What are the primary barriers hindering the development and application of these digital competencies within the accounting profession globally?*

RQ4: *What institutional strategies or educational responses have been proposed to address these challenges?*

3.2. Search Strategy

The search strategy for this review was designed to maximise transparency, reproducibility, and conceptual precision, in accordance with the PRISMA 2020 guidelines. The framework was structured around three core conceptual domains—FinTech technologies, digital competencies, and the accounting profession—which were derived directly from the research objectives and refined through preliminary scoping to ensure comprehensive coverage of relevant terminology in the academic literature. The digital competencies domain was informed by the International Federation of Accountants [3] competency framework, which identifies advanced digital literacy and data analytics capabilities as essential for accounting professionals in FinTech-integrated environments. This emphasis aligns with the work of Ha, Le and Nguyen [2], who highlight the importance of analytics skills, technology readiness, and algorithmic accountability in professional upskilling.

Boolean search logic was conceptually consistent across the three selected databases—Scopus, Web of Science Core Collection, and EBSCOhost (Business Source Complete)—but adapted to accommodate each platform's indexing fields and conventions. To ensure consistency, the searches were limited to English-language, peer-reviewed journal articles published between 1 January 2020 and 30 June 2025, reflecting the post-pandemic acceleration of digital transformation. No geographical or regional restrictions were applied at the query or screening stage, ensuring a global scope for the review. The complete database-specific search strings are provided in Appendix A, and representative keyword sets for each conceptual domain are summarised in Table 1.

Table 1. Search Strategy Across Conceptual Domains.

Theme	Search Strings and Keywords
FinTech	fintech; "financial technolog *"; "digital finance"; "internet finance"; "e-finance"; "mobile money"; "mobile payment *"; "digital payment *"; blockchain; "distributed ledger *"; DLT; "smart contract *"; "robo-advisor *"; "open banking"; insurtech; regtech; "robotic process automation"; RPA; "cloud accounting"; ERP; "machine learning"; "artificial intelligence"; "big data";
Digital Competencies	"digital competenc *"; "digital skill *"; "data liter *"; "analytics skill *"; "technology readiness"; "digital readiness"; "ICT skill *"; cybersecurity; "data governance"; privacy; "ethical AI"; "algorithmic accountability";
Accounting Profession	Account *; accountant *; auditor *; "accounting profession"; "accounting education"; "financial reporting"; assurance

*Note: The asterisk indicates truncation used in database searches to retrieve multiple word endings (e.g., competence, competencies, competency) *.*

To ensure transparency and reproducibility, we explicitly constrained searches to database-specific metadata fields as follows: (i) Scopus: TITLE-ABS-KEY (article title, abstract, and author keywords); (ii) Web of Science Core Collection: TS topic field (article title, abstract, author keywords, and Keywords Plus); (iii) EBSCOhost—Business Source Complete: a combined fielded query across TI (title), AB (abstract), and SU/DE (subject/descriptor terms). The full, database-specific strings reflecting these field restrictions are reported in Appendix A. Using these parallel field scopes harmonised retrieval across platforms and reduced construct drift between databases.

All search procedures, including database selection, field specification, and deduplication, were reported in accordance with the PRISMA 2020 guideline and incorporate search-transparency principles consistent with the PRISMA-S extension, ensuring full reproducibility of the review process.

3.3. Data Sources and Selection Criteria

To ensure comprehensive coverage of high-quality scholarship, this review utilised three leading academic databases: Scopus, Web of Science (WoS) Core Collection, and EBSCOhost (Business Source Complete). These databases were selected for their extensive indexing of peer-reviewed journals in accounting, information systems, business education, and financial technology, and are widely recognised as authoritative sources for systematic reviews in business and management disciplines.

The search was limited to English-language, peer-reviewed journal articles and review papers published between 1 January 2020 and 30 June 2025, capturing the period of accelerated digital transformation in the post-pandemic era. Eligible studies examined the intersection of FinTech technologies and accounting-related digital competencies, providing either empirical evidence or theoretical contributions relevant to professional upskilling. Studies were excluded if they focused solely on consumer adoption of FinTech, addressed general finance or banking issues without explicit reference to accounting, or discussed digital technologies without a clear link to accounting competencies. Non-English publications, conference proceedings, dissertations, theses, editorials, and other forms of grey literature were also excluded to maintain methodological rigour and comparability.

The final database search was executed on 1 August 2025, allowing sufficient time for the indexing of June 2025 publications while ensuring that all retrieved studies were incorporated into the synthesis prior to manuscript submission.

To enhance comparability and ensure methodological consistency, this review further limited its corpus to journals ranked ABS 2 or higher according to the ABS/AJG 2021 Academic Journal Guide [22]. While this decision resulted in the exclusion of a substantial

number of records (n = 7142), it strengthened conceptual precision and concentrated the analysis on scholarship published in reputable outlets recognised for their rigorous peer-review standards within business, management, and accounting. This approach aligns with best practices in prior systematic reviews in accounting and information systems, where journal ranking thresholds have been applied to reinforce analytical robustness and maintain quality assurance standards.

To maintain methodological rigour, the review focused exclusively on English-language, peer-reviewed journal articles ranked at ABS Level 2 or above. This scope definition was intended to ensure analytical comparability and scholarly quality across sources.

3.4. Screening and Selection Process

Following the database searches, all retrieved records from Scopus, Web of Science, and EBSCOhost were exported in RIS format and consolidated within EndNote 20 reference-management software (licenced by Walailak University) for deduplication. The automated duplicate-detection procedure matched records by title, author(s), publication year, and DOI, and was subsequently verified manually to ensure that variations in metadata—such as author order, punctuation, or journal abbreviations—did not result in the unintended removal of unique studies. This hybrid approach safeguarded dataset integrity and adheres to the PRISMA 2020 guideline for transparent reporting of search and data-management procedures.

The database search initially identified 17,506 records across Scopus (4815), Web of Science (2507), and EBSCOhost (10,184). After the removal of 10,259 duplicates, 7247 unique records remained for screening. Articles published in journals below ABS Level 2 were excluded, resulting in 105 records for title-and-abstract screening. Subsequently, studies that did not directly address the accounting profession were removed, and the remaining 72 articles were assessed at full-text level. Following the application of the inclusion and exclusion criteria, 40 studies met all conditions and were retained for qualitative and bibliometric synthesis.

Before commencing the full screening, both reviewers jointly reviewed and refined the inclusion and exclusion criteria to ensure a shared understanding and consistent application. To minimise bias, two researchers independently conducted all screening stages. Discrepancies were resolved through discussion, and unresolved cases were adjudicated by a third reviewer to ensure consistency and transparency. In instances of disagreement, both reviewers first revisited the study's abstract or full text and compared their interpretations against the predefined inclusion and exclusion criteria. If consensus could not be reached, the third reviewer independently evaluated the disputed paper and made the final decision. This arbitration process ensured that all inclusion and exclusion judgments were grounded in clearly documented criteria rather than individual interpretation. Given the interpretive nature of the screening process, inter-rater reliability was addressed through independent review and adjudication procedures rather than through statistical measures.

Although a formal quality appraisal instrument such as CASP or MMAT was not employed, methodological robustness was ensured through a multi-level quality control process. Only peer-reviewed journal articles ranked ABS Level 2 or higher were included, ensuring that all studies met internationally recognised standards of scholarly rigour. During full-text screening, both reviewers also assessed each article for methodological clarity, transparency of research design, and relevance to the review objectives. These procedures collectively ensured that the final corpus comprised methodologically sound and conceptually robust studies consistent with the aims of a high-quality systematic review.

To maintain transparency, the complete screening workflow—including the number of records at each stage and the reasons for exclusion—is illustrated in Figure 1 (PRISMA

2020 flow diagram). This figure summarises the progression from initial identification through to final inclusion without duplication of data reported in the text. The final corpus predominantly comprised publications in journals ranked within the higher tiers of the ABS Academic Journal Guide, underscoring both the methodological rigour and the growing scholarly significance of digital competencies within the accounting profession.

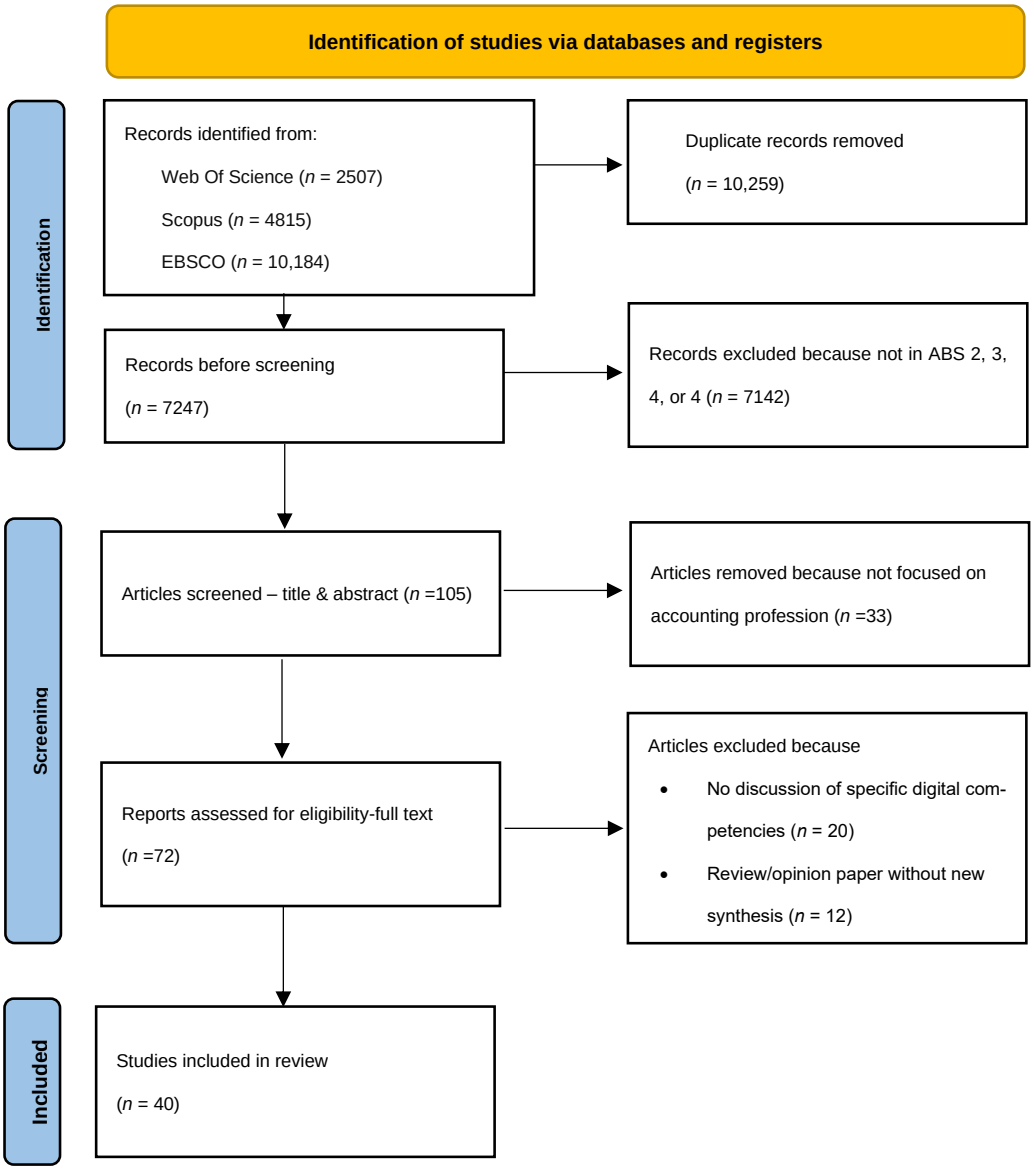

Figure 1. The PRISMA flow diagram for the systematic review process. Note: PRISMA flow diagram showing systematic review stages from database search to final selection of 40 articles meeting inclusion criteria.

3.5. Data Extraction and Coding

A structured data extraction template was employed to capture key attributes of each study, including author(s), year of publication, journal outlet, research focus, methodological approach, country or region of study, and the specific digital competencies examined. Additional fields recorded whether studies referenced established frameworks (e.g., IFAC, DigComp, UTAUT2), addressed barriers to professional readiness, or offered policy and educational recommendations.

To enable systematic synthesis, the extracted studies were coded inductively into four analytical dimensions: (i) digital competency frameworks and models; (ii) curriculum

and training adaptations; (iii) institutional or infrastructural readiness, with emphasis on developing economies; and (iv) policy or strategic interventions aimed at addressing skill gaps in the accounting profession. Coding consistency was maintained through iterative comparison and cross-checking by two researchers, with disagreements resolved through discussion.

This structured extraction and coding process ensured that both descriptive patterns (e.g., temporal and journal distribution) and thematic insights (e.g., professional upskilling strategies) could be systematically analysed. The results of this process are presented in Section 4, beginning with a descriptive overview of the 40 included studies.

3.6. Bibliometric and Thematic Analysis

To complement the systematic review, a bibliometric and thematic analysis was performed to identify conceptual clusters and visualise the intellectual structure of FinTech-related research within the accounting profession. The bibliometric mapping was conducted using VOSviewer version 1.6.20, a software tool widely used for constructing and visualising bibliometric networks [23]. The analysis applied the full-counting method, which assigns equal weight to all keyword occurrences across studies, and employed association-strength normalisation to determine the relative strength of co-occurrence links between terms.

To ensure analytical precision, the minimum keyword occurrence threshold was set to two, and the minimum link strength between co-occurring terms was set to 0.05. These thresholds were selected to balance inclusiveness and clarity, allowing the network to highlight both dominant and emerging concepts without introducing excessive noise. To test the robustness of the network, a sensitivity analysis was performed by incrementally adjusting the occurrence threshold (from two to three) and observing the stability of the resulting clusters. The main network structure, including the four major thematic clusters, remained consistent across threshold variations, confirming the reliability of the selected parameters.

Under these parameters, the resulting network map illustrated distinct thematic clusters reflecting the evolving landscape of digital competencies in FinTech-oriented accounting research. Keywords such as blockchain, artificial intelligence, data analytics, automation, digital transformation, and ethics formed the central nodes of the co-occurrence network, indicating strong interconnections among technological, professional, and ethical dimensions. The visualisation revealed four principal clusters corresponding to (i) professional transformation and digital skills, (ii) educational and curriculum adaptation, (iii) technological integration and data analytics, and (iv) ethics and governance in FinTech environments.

These clusters were interpreted thematically in conjunction with systematic synthesis, providing a comprehensive perspective on how FinTech reshapes the accounting profession. The integration of bibliometric mapping with thematic coding enhanced the robustness of the analysis and offered a visual and conceptual understanding of key research directions, consistent with best practices in bibliometric and systematic review methodologies.

4. Results

4.1. Descriptive Analysis: Quantitative Exploration

The systematic search and screening process, detailed in the PRISMA flow diagram (Figure 1), yielded a final corpus of 40 journal articles for inclusion in this review. This final sample represents a focused and high-quality body of contemporary scholarship published between January 2020 and June 2025. The size of the corpus is a direct outcome of the review's stringent inclusion criteria: a narrow temporal focus on the post-pandemic era, a

precise thematic scope on the digital competencies required in the accounting profession, and the application of a journal quality filter based on the ABS Academic Journal Guide. This rigorous selection process ensures that the subsequent synthesis is grounded in the most relevant and impactful literature.

This descriptive analysis characterises the corpus to provide essential context for the subsequent bibliometric and thematic synthesis. Specifically, three dimensions are examined: (i) the Annual distribution of publications (2020–2025), tracing the trajectory of research activity during the FinTech era; (ii) the distribution of studies across journals and their corresponding ABS categories, indicating both disciplinary orientation and scholarly impact; and (iii) the methodological approaches adopted, highlighting the balance between empirical and conceptual contributions. Together, these descriptive insights establish a foundation for the bibliometric mapping and thematic analyses presented in the following sections, directly supporting the study's objective of clarifying how accounting-related digital competencies have been conceptualised and investigated in recent scholarship.

The annual distribution of publications (Figure 2) shows a sharp increase in research output from 2020 onwards, reflecting the growing scholarly attention to digital competencies in the accounting profession during the FinTech era. Only one study was published in 2020, but the number rose to eight in 2021, coinciding with the accelerated adoption of remote auditing, cloud-based accounting systems, and AI-enabled applications following the COVID-19 pandemic. Although the count dropped to four in 2022, it recovered in 2023 with seven publications. The peak occurred in 2024 and continued into 2025, with 12 studies published in each year. This sustained increase demonstrates that the topic has become a core concern in accounting scholarship, underscoring the urgency of understanding and developing digital competencies to support professional adaptation in a rapidly evolving technological environment.

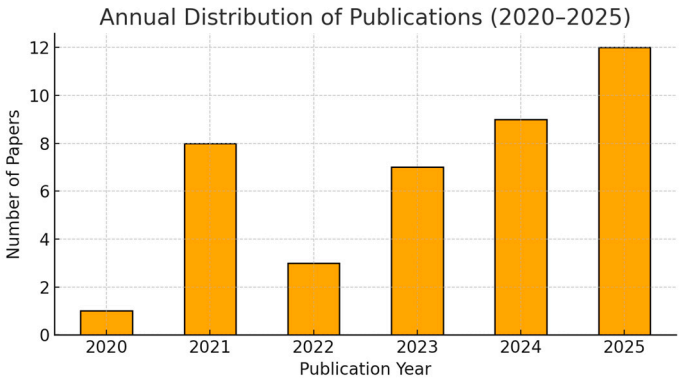

Figure 2. Annual distribution of publications (2020–2025). *Note: Counts reflect the 2020–June 2025 study window and include only the final set of included journal articles in this review.*

The distribution of studies across journals (Table 2) demonstrates that research on digital competencies in accounting is concentrated within a small set of recognised outlets. The International Journal of Accounting Information Systems (ABS 2) emerges as the dominant contributor, accounting for 12 studies and reflecting the journal's specialised focus on technology-driven transformations in accounting practice. The Accounting, Auditing and Accountability Journal (ABS 3) follows with six contributions, underscoring the intersection of digitalisation, accountability, and institutional change. Other ABS-ranked journals, such as Accounting Horizons (ABS 3), further reinforce that this discourse is embedded within reputable scholarly venues.

Table 2. Top 5 journals by number of papers included in the review.

Rank	Journal	Count
1	International Journal of Accounting Information Systems	12
2	Accounting, Auditing and Accountability Journal	6
3	Accounting Horizons	3
4	Journal of Accounting Education	3
5	Journal of International Accounting, Auditing and Taxation	2

Note: The table lists the 5 journals with the highest number of studies included.

At the same time, contributions from Journal of Accounting Education and Journal of International Accounting, Auditing and Taxation—both of which are not currently ABS-ranked—indicate that emerging and regionally oriented outlets are also engaging with the topic. This mix reflects both consolidation in established accounting journals and diversification into broader educational and international perspectives. Taken together, the evidence highlights that while the field is anchored in mid- to high-quality outlets recognised in the ABS framework, it also benefits from contributions in specialised and practice-oriented journals, which enrich the discourse by broadening its professional and pedagogical relevance.

Table 3 shows that empirical research overwhelmingly dominates the reviewed studies, accounting for 87% of the total corpus. This clear prevalence indicates that the field has become highly evidence-driven, with scholars prioritising data-oriented approaches such as surveys, case studies, bibliometric analyses, and advanced computational methods to evaluate the impact of digital competencies in practice. Conceptual contributions remain limited (5%), reflecting a modest effort to build or refine theoretical frameworks that can guide empirical testing. Meanwhile, review-based work constitutes only 8% of the dataset, suggesting that the field has only begun to consolidate its knowledge base through integrative syntheses.

Table 3. Methodological approaches adopted in the reviewed studies.

Approach	Count	% of Total
Empirical	35	87%
Conceptual	3	8%
Review/Other	2	5%

This distribution highlights two critical insights. First, the predominance of empirical studies demonstrates the profession's urgent demand for practice-relevant, data-driven insights into how accountants develop and apply digital competencies in FinTech-integrated environments. Second, the relative scarcity of conceptual and review contributions points to a gap in higher-level theorisation and synthesis, which could unify fragmented empirical findings and provide a more coherent foundation for future inquiry.

Taken together, these descriptive findings establish the contextual foundation for the subsequent bibliometric analysis. While the temporal trends and journal distribution reflect the increasing scholarly momentum in this field, the methodological profile reveals both the strengths of evidence-driven inquiry and the weaknesses in theoretical refinement and integrative review. Building on this foundation, the next section employs bibliometric mapping to visualise the intellectual structure of the literature and to identify the thematic clusters that define current research on digital competencies in the accounting profession.

4.2. Exploratory Mapping

For the exploratory mapping of research themes, we employed network analysis and keyword co-occurrence mapping to examine the conceptual structure of the literature on digital competencies in the accounting profession. The analysis was conducted in VOSviewer version 1.6.20 [23], which generates a network of nodes representing keywords, where node size reflects frequency of occurrence and connections indicate the co-occurrence of terms within the same publication. Keywords that appeared together in article titles, abstracts, or keyword fields were treated as co-occurrences. This method enables the identification of clusters of related concepts and provides a visual representation of how research topics are interlinked. Figure 3 illustrate the principal clusters identified, together with the most frequently occurring keywords and their thematic associations.

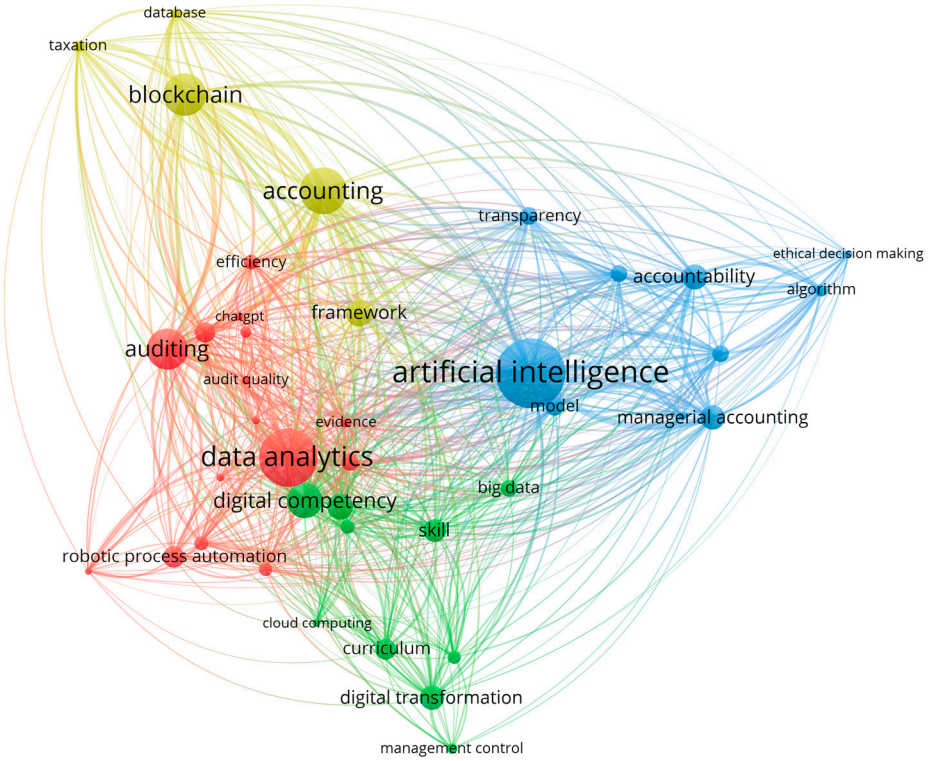

Figure 3. Keyword Co-occurrence Network of Research Themes [23].

4.2.1. Thematic Clusters in the Literature

The network visualisation (Figure 3) maps the primary research themes, revealing a clear conceptual structure organising around four interlinked clusters. These clusters represent the dominant intellectual pillars of literature, mapping the key conversations on how digital competencies are being conceptualised and applied within the accounting profession.

Cluster 1 (Red)—Auditing and Data Analytics as Professional Practice Drivers.

This cluster is anchored by the strong co-occurrence of auditing and data analytics, supported by related terms such as digital competency, audit quality, and robotic process automation. Together, these keywords reflect the shift in auditing practice towards technology-enabled assurance, where analytics tools, automation, and digital capabilities are becoming core to audit performance. The frequent association of efficiency and evidence with these terms further underscores the profession's emphasis on leveraging digital tools to improve audit reliability and timeliness. This cluster highlights that auditing functions serve as both a testing ground and a primary application domain for accounting-related digital competencies.

Cluster 2 (Green)—Digital Transformation and Educational Adaptation.

This cluster centres on digital transformation and curriculum, linking closely with cloud computing, skill, and management control. The prominence of these terms illustrates that a substantial body of research has concentrated on the educational response to digital disruption. Studies in this cluster emphasise how accounting curricula are being redesigned to embed digital skills and how universities are aligning professional development pathways with industry expectations. The appearance of digital competency as a bridging term reinforces that competency development is not viewed solely as a workplace issue, but as a lifelong process beginning with higher education and continuing through professional upskilling.

Cluster 3 (Blue)—Artificial Intelligence and Professional Accountability.

The largest node in the network, artificial intelligence, dominates this cluster, reflecting the centrality of AI as both a technological driver and a conceptual anchor in the literature. Closely tied are accountability, managerial accounting, algorithm, and ethical decision-making. This indicates that AI is not only studied as a technical innovation but also as a catalyst for rethinking professional accountability, judgement, and governance in accounting. The strong link to transparency suggests that scholars increasingly frame AI adoption through an ethical and governance lens, where issues of explainability and fairness are as important as technical functionality. This cluster represents the literature's recognition that digital competencies cannot be separated from ethical and institutional responsibilities.

Cluster 4 (Yellow)—Blockchain and Accounting Innovation.

This cluster is anchored by blockchain, with strong ties to accounting, database, and taxation. Its prominence indicates that blockchain is being framed as a transformative technology with the potential to redefine the infrastructure of financial reporting and recordkeeping. Research in this cluster often positions blockchain as both an opportunity and a disruption, requiring accountants to develop new forms of literacy to engage with distributed ledger systems. The association with accounting as a core node reflects that blockchain is viewed not in isolation, but in terms of its integration into traditional accounting structures and its potential to reshape audit trails, contracts, and compliance.

4.2.2. Temporal Evolution of Research Themes

To supplement the structural map, a temporal analysis of the keyword co-occurrence network was conducted to trace the evolution of research themes over the 2020–2025 period. The resulting overlay Visualisation (Figure 4) colours each node based on the average publication year of the documents in which the keyword appears. Cooler, darker colours (purple/blue) indicate foundational topics that were prominent earlier in the timeframe, while warmer, lighter colours (green/yellow) represent more recent, emerging research fronts.

The temporal overlay confirms and extends the thematic structure identified in Section 4.2.1. Early contributions, shown in darker blue tones, concentrated on broad professional anchors such as accounting, curriculum, and digital transformation. These themes reflect the immediate response of scholars to the post-pandemic disruption, where the emphasis was placed on setting out the need for professional adaptation and embedding digital skills into accounting education. This stage of research can be seen as context-setting, mapping the problem space rathers pecifying solutions. than specifying solutions.

As the field matured, research attention shifted towards specific enabling technologies, particularly data analytics and artificial intelligence. Both appear in brighter yellow nodes, signalling their prominence in more recent publications. This indicates a transition from broad discussions of digitalisation to targeted explorations of technological drivers, consistent with Cluster 3 in the structural map. Importantly, the prominence of artificial in-

telligence as a central, recent keyword suggests that it has become a focal point of scholarly debate, shaping how competencies are defined in the accounting profession.

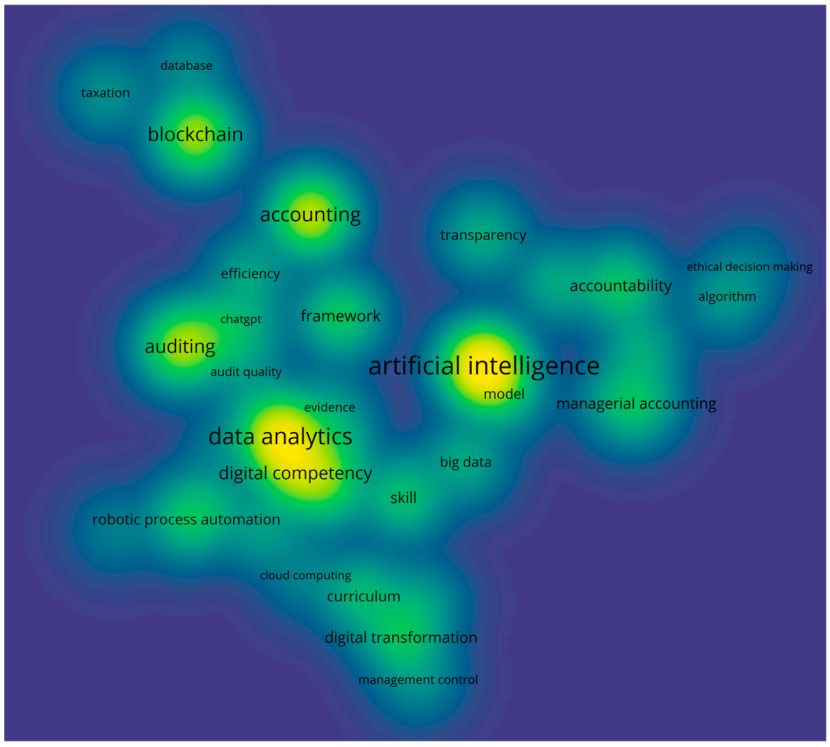

Figure 4. Thematic Density Map of Core Research Keywords [23].

The overlay also highlights the emergence of risk-related and ethical concerns. Keywords such as accountability, transparency, and ethical decision-making appear in the lighter spectrum, underscoring that scholarship has begun to address not only technical proficiency but also the human-centric dimensions of professional judgement. This evolution directly aligns with Cluster 4 identified earlier, reinforcing the argument that digital competencies cannot be divorced from broader questions of responsibility and governance.

Finally, terms like blockchain and robotic process automation occupy an intermediate temporal position, suggesting that while they are increasingly recognised as disruptive forces, they remain at a transitional stage in scholarly attention. This pattern indicates a research frontier: blockchain is acknowledged but has yet to mature into the dominant discourse that AI and data analytics now command.

Taking together, the temporal analysis demonstrates a clear progression from general frameworks to focused, technology-driven debates, and finally towards the integration of ethical and professional responsibilities. This trajectory illustrates not only the maturation of the scholarly conversation but also the way in which the field is converging on a dual imperative: mastering advanced technologies while ensuring ethical accountability in their application.

4.3. Thematic Content Analysis

Following the bibliometric mapping, a thematic content analysis of the 40 articles was conducted to synthesise the key findings, debates, and contributions within each of the four identified research clusters. This qualitative synthesis provides a granular view of the scholarly landscape, detailing how the literature has addressed the professional, educational, technological, and ethical dimensions of the digital transformation in accounting. Together, the four clusters provide complementary perspectives, confirming the structural

patterns observed in Figures 3 and 4 while also revealing important tensions and gaps that require further research.

To guide the thematic synthesis, Table 4 provides an overview of the four clusters, including their dominant keywords and representative themes. This table serves as an orienting device for the detailed discussion in the subsections that follow

Table 4. Thematic Clusters of Research on Digital Competencies in Accounting.

Cluster	Dominant Keywords	Representative Themes
Cluster 1 (Red): Auditing and Data Analytics as Professional Practice Drivers	auditing, data analytics, audit quality, robotic process automation, efficiency, evidence	Focus on how digital tools are integrated into auditing practices. Studies highlight efficiency gains, data-driven assurance, and the role of automation in strengthening audit quality and reliability.
SCluster 2 (Green): Digital Transformation and Educational Adaptation	digital transformation, curriculum, digital competency, cloud computing, skill, management control	Emphasis on curriculum reform and professional development. Literature addresses embedding digital competencies in accounting education, lifelong learning, and adapting to technological change in both academia and practice.
Cluster 3 (Blue): Artificial Intelligence and Professional Accountability	artificial intelligence, accountability, managerial accounting, algorithm, ethical decision-making, transparency	Explores AI as a transformative force in accounting. Studies link AI to ethical concerns, governance, and professional accountability, stressing the need for competencies that balance technical literacy with judgement and transparency.
Cluster 4 (Yellow): Blockchain and Accounting Innovation	blockchain, accounting, database, taxation	Highlights blockchain's potential to reshape accounting infrastructure, audit trails, and compliance. Research positions blockchain as both an opportunity and disruption, requiring accountants to build new literacies around distributed ledger technologies.

The four clusters identified through bibliometric mapping (Section 4.2.1; Figure 3) are retained as the structural basis for thematic content analysis. However, for interpretive clarity, the clusters are relabeled in this section to emphasise their substantive contributions. Table 5 presents the correspondence between the bibliometric cluster labels and the interpretive labels used in the qualitative synthesis. This ensures transparency while highlighting the shift from structural co-occurrence patterns to thematic meaning.

Table 5. Correspondence between Bibliometric and Thematic Cluster Labels.

Bibliometric Cluster Label (4.2.1/Figure 3)	Thematic Cluster Label (4.3)
Cluster 1: Auditing and Data Analytics as Professional Practice Drivers	Cluster 1: The Professional Context and Digital Transformation
Cluster 2: Digital Transformation and Educational Adaptation	Cluster 2: The Educational Response and Curriculum Development
Cluster 3: Artificial Intelligence and Professional Accountability	Cluster 3: Core Competencies and their Technological Drivers
Cluster 4: Blockchain and Accounting Innovation	Cluster 4: Blockchain, Ethics, and Professional Responsibility

It is important to note that the cluster labels in Table 5 are drawn directly from the bibliometric mapping, which reflects the most salient co-occurring keywords. However, keyword-based labels often capture only the technical surface of a research stream. To provide greater conceptual clarity, the clusters are re-labelled in Section 4.3 on the basis of thematic content analysis. For example, Cluster 4 is dominated by terms such as "blockchain" and "innovation," yet the articles grouped within this cluster consistently extend beyond technical adoption to address issues of transparency, accountability, and ethical responsibility. Accordingly, the cluster is re-labelled as "Blockchain, Ethics, and Professional Responsibility," ensuring that both the technological and normative dimensions of this research stream are captured. This approach of aligning bibliometric clusters with thematic interpretation allows the subsequent analysis to remain faithful to the data while also reflecting the broader intellectual concerns present in the literature.

4.3.1. Cluster 1 (Red): The Professional Context and Digital Transformation (Bibliometric: Auditing and Data Analytics as Professional Practice Drivers)

The literature in this cluster establishes the overarching professional context, examining how the broad disruptive force of FinTech manifests as a digital transformation within the accounting profession. A primary theme is the redefinition of the accountant's role, shifting from record-keeping and compliance toward forward-looking strategic advisory. Yigitbasioglu et al. [5] highlight how accountants in public service are now expected to leverage digital tools for advisory services, reshaping the profession's value proposition. This is not merely additive but a structural reconfiguration of professional identity, where digital proficiency becomes indispensable for relevance.

Auditing emerges as a focal point, with studies pointing to a shift from periodic, sample-based testing toward continuous assurance enabled by AI and blockchain tools. Professional bodies such as the AICPA and IFAC are also influential in this cluster, with several studies noting their role in reshaping competency frameworks and ethical guidelines to accommodate digital disruption. This confirms the bibliometric finding that professional institutions remain central nodes of influence (Figure 3).

Meanwhile, the cluster reveals a research gap: while digital transformation is widely acknowledged, the literature offers limited empirical insight into how firms of different sizes operationalize this transition. Most case studies privilege large firms, leaving small and medium-sized enterprises (SMEs) underexamined.

4.3.2. Cluster 2 (Green): The Educational Response and Curriculum Development (Bibliometric: Digital Transformation and Educational Adaptation)

As the largest cluster in the network, this theme addresses the critical role of academia and professional training in bridging the "expectations gap" between competencies demanded by industry and those provided by accounting curricula. Birt, et al. [24] show that universities in Australia and New Zealand lag in integrating ICT and analytics skills, reinforcing the concern that traditional curricula remain misaligned with practice.

Curriculum modernization is the dominant response, encompassing strategies such as embedding data analytics throughout core modules, offering standalone ICT courses, and integrating digital tools into case-based pedagogy. Socoliuc [4] underscores the importance of lifelong learning, noting that both students and mid-career professionals require sustained upskilling and reskilling. However, challenges persist lack of faculty expertise in emerging technologies, high costs of digital infrastructure, and resistance to curricular reform continue to slow adoption.

The bibliometric overlay (Figure 4) supports this cluster's significance, showing curriculum-related terms as early but persistent themes. Yet, the content analysis adds nuance: while calls for reform are strong, empirical evaluations of actual learning out-

comes remain scarce. Future research must therefore go beyond advocacy to test which pedagogical interventions most effectively build digital competencies.

4.3.3. Cluster 3 (Blue): Core Competencies and Their Technological Drivers (Bibliometric: Artificial Intelligence and Professional Accountability)

This cluster provides a detailed view of the core competencies demanded by the FinTech ecosystem, framing skills in direct relation to specific technological drivers such as data analytics and artificial intelligence (AI). Data analytics is consistently positioned as foundational, encompassing not only technical tasks such as data extraction and visualisation but also higher-order functions of interpretation and decision support. Several studies describe analytics as the "gateway skill" that links accountants to broader AI- and big data–driven systems.

Artificial intelligence and robotic process automation (RPA) are also prominent, with Zhang, et al. [25] emphasising the need for accountants to understand algorithmic logic and develop competencies in oversight and exception handling. Blockchain technologies, particularly distributed ledger systems and smart contracts, further expand the competency set, especially for audit and transaction verification.

Recent advances further demonstrate how contextual language learning models, such as BERT, can be applied to fraud detection, significantly improving the accuracy of textual analysis in audit settings [26]. This reflects the growing importance of advanced AI tools as competency drivers within the profession, extending traditional data analytics toward more sophisticated natural language processing capabilities.

What is striking is that competencies are not defined abstractly but in direct relation to these technological drivers, confirming Cluster 3's structural position in the bibliometric map (Figure 3). However, this stream remains heavily weighted toward technical capability. A synthesis across studies reveals limited integration with the ethical and human-centric dimensions emphasised in Cluster 4, suggesting a bifurcation of the literature that future work should address.

4.3.4. Cluster 4 (Yellow): Blockchain, Ethics, and Professional Responsibility (Bibliometric: Blockchain and Accounting Innovation)

The fourth cluster underscores that technical capacity alone is insufficient in a digitised profession. Instead, ethical judgement and professional responsibilities emerge as equally critical. A central theme is the redefinition of professional scepticism for the algorithmic era. Rather than passively accepting automated outputs, accountants are called to interrogate data inputs, model assumptions, and potential biases.

La Torre, et al. [27] connect these responsibilities to data privacy and security, arguing that safeguarding client data is now a professional duty. Other studies highlight risks of algorithmic bias, opaque "black box" models, and the ethical implications of data-driven decision-making. This aligns with the bibliometric overlay (Figure 4), where terms such as risk, ethics, and data privacy appear as more recent, emerging themes.

The significance of this cluster lies in its normative orientation: as automation advances, the enduring human value of accountants resides in their ability to exercise ethical and sceptical judgement. Yet, while literature strongly articulates this need, it provides fewer practical frameworks for how such competencies can be trained, assessed, and certified, leaving a critical research gap.

5. Discussion and Research Gaps

The preceding analysis provides a structured overview of contemporary scholarship on the digital competencies required within the accounting profession. Building on the bibliometric mapping and thematic synthesis, this section integrates the findings to address

the study's guiding research questions, identify salient gaps in the literature, and consider the implications for both theory and practice.

The urgency of these competencies has been particularly pronounced in the wake of COVID-19, which acted as a catalyst for remote auditing, virtual collaboration, and rapid digitalisation across accounting practices [28]. The pandemic not only accelerated the adoption of tools such as cloud accounting and AI-enabled auditing but also exposed structural weaknesses in faculty preparation and institutional curricula [29], thereby amplifying the "expectations gap" identified in this review.

Although the immediate disruptions of the pandemic have eased, its legacy continues to shape both professional practices and academic inquiry. The results highlight that the accounting profession is undergoing a profound transformation, driven most prominently by the integration of core FinTech enablers—such as artificial intelligence, data analytics, and blockchain—into professional functions [30,31]. In this context, digital competencies are no longer optional but constitute essential capabilities for sustaining professional relevance [32,33]. The evidence shows that the modern workplace increasingly demands a dynamic blend of technical proficiency, analytical capability, and ethical judgement—competencies that extend well beyond traditional ICT literacy [34].

This study therefore contributes to ongoing debates in accounting education and practice by clarifying the extent to which emerging trends in the profession are reflected in course content, training resources, and professional frameworks [35]. In particular, the findings underscore the importance of aligning auditing curricula with technological advances, ensuring that educational provision keeps pace with the demands of practice. For instance, accounting programmes could integrate modules such as "AI for Audit and Assurance," which merge algorithmic logic with professional ethics to prepare students for data-driven assurance environments. Such applied coursework enables learners to translate theoretical principles into the analytical reasoning demanded by contemporary audit practices.

At the same time, the synthesis highlights areas where empirical research remains limited, especially concerning how competencies are taught, assessed, and applied in diverse institutional and organisational contexts. Despite these advances, the literature remains uneven and fragmented, leaving several critical gaps that warrant further exploration.

Against this backdrop, the following subsection (5.1) synthesises the findings to explicitly address the four research questions that guided this review. In this way, it establishes the empirical and conceptual foundation from which the subsequent identification of research gaps (5.2) and implications for theory and practice: (5.3) can be drawn.

5.1. Synthesis of Findings and Answering the Research Questions

In response to

RQ1: *What digital competencies are considered essential for accounting professionals in FinTech-integrated environments?*

The analysis reveals a multi-layered competency framework that extends beyond technical proficiency to encompass human-centric judgement and ethical responsibility. Professional bodies such as AACSB, AICPA, and IMA have explicitly advocated the integration of technology and data analytics into accounting curricula and certification requirements [36,37], underscoring the centrality of digital skills to the profession's future.

At the technical level, the literature—particularly studies grouped within Cluster 3—identifies a core set of technology-driven skills that are now considered foundational. These include advanced capability in data analytics, which supports audit efficiency, fraud risk assessment, and informed decision-making [35]; literacy in artificial intelligence (AI) and robotic process automation (RPA), enabling accountants to interpret algorithmic logic

and manage exceptions in automated processes; and applied knowledge of blockchain technologies, which provide transparent, secure, and verifiable records that enhance assurance functions [38]. Collectively, these competencies position accountants not as passive users of technology but as active supervisors of complex digital systems.

Complementing these are a second layer of human-centric competencies, which the literature (Cluster 4) consistently frames as indispensable. These include a redefined sense of professional scepticism for the algorithmic era, requiring accountants to actively interrogate AI outputs and identify potential model biases [39,40]; robust expertise in data privacy and security, ensuring the protection of sensitive client information and the management of ethical risks associated with pervasive data use [41]; and the ability to critically assess algorithmic bias, safeguarding fairness and transparency in AI-enabled decision-making [42,43].

Taken together, the synthesis indicates that the contemporary accountant's required skillset is not reducible to a checklist of software proficiencies. Instead, it constitutes a sophisticated integration of technical acumen with enduring professional responsibilities, ensuring that technology adoption strengthens, rather than compromises, the integrity of the profession.

RQ2: *How are these competencies conceptualised or framed in the literature?*

The literature conceptualises digital competencies through two primary, yet often bifurcated, frames. The first is an instrumental frame, where competencies are defined in direct relation to specific technological drivers and their application in professional practice (Cluster 3). In this view, digital skills are framed as tools for enhancing the efficiency, quality, and scope of accounting functions such as auditing and financial reporting. For example, data analytics is consistently valued for improving audit efficiency and accuracy through 100% population testing, enhanced fraud risk assessment, and decision support [34,35]. Similarly, AI and RPA are framed as instrumental tools for automating cognitive and repetitive tasks, boosting audit quality and efficiency by generating insights and reducing manual workloads [40,44,45]. Blockchain technologies are positioned as safeguards for data integrity, enabling secure, transparent, and verifiable real-time record-keeping that strengthens assurance processes [38,46]. This instrumental frame reflects a technocentric orientation in which competencies are directly tied to the mastery of emerging digital tools.

The second is an institutional frame, where competencies are shaped not only by technological imperatives but also by the professional ecosystem (Cluster 1) and its educational subsystems (Cluster 2). Here, digital competencies are framed as institutional requirements, mandated by professional bodies such as the AICPA and IFAC, to ensure professional relevance and uphold public trust. These mandates are operationalised in standards and frameworks such as the AACSB's Standard A7 (now A5) and the AICPA's CPA Examination Blueprints, which explicitly require technology integration into accounting curricula [24,36,37]. Professional associations such as the IMA have similarly embedded technology into licensure examinations, reinforcing these competencies as prerequisites for maintaining professional relevance [37,47]. Within academia, competencies are further framed as essential learning outcomes designed to bridge the persistent "expectations gap" between graduates' skillsets and industry requirements.

A key insight from this synthesis is the relative lack of integration between these two frames. Studies often privilege either technical capability or institutional responsibility, with limited attention to how these perspectives interact. This bifurcation becomes evident in practice when auditors opt to "audit around" AI systems due to trust concerns rather than directly auditing the technology itself, highlighting accountability gaps [45]. Similarly, the vagueness in professional standards regarding the depth of data analytic competencies

required exacerbates the fragmentation [37]. Taken together, the evidence shows that while both frames are well established, the field has yet to fully articulate a holistic model that unites technological mastery with institutional accountability.

RQ3: *What are the primary barriers hindering the development and application of these digital competencies within the accounting profession globally?*

The literature identifies significant barriers to the development and application of digital competencies, which are predominantly institutional and educational in nature, as reflected in Cluster 2. A primary impediment is institutional inertia within academia, resulting in a persistent misalignment between university curricula and the competencies demanded by a FinTech-driven industry. This mismatch creates a widely recognised "expectations gap" in digital skills among graduates [24,48].

Several interrelated challenges exacerbate this gap. First, there is a shortage of faculty expertise in emerging technologies, with many accounting departments lacking staff trained in data analytics, AI, or blockchain [36]. Second, the high cost of digital infrastructure—such as specialised computer labs, licenced software, and secure data environments—creates a resource barrier for institutions seeking to modernise pedagogy [36]. Third, organisational resistance to curricular reform slows the integration of digital competencies into core programmes, reinforcing traditional models of accounting education [35]. Collectively, these factors hinder the ability of educational systems to keep pace with professional and technological change.

Beyond academia, the literature highlights a structural blind spot in research and practice: most studies disproportionately examine large firms, particularly the Big Four, while small and medium-sized enterprises (SMEs) remain underexplored [31,44]. This omission is problematic because SMEs face distinct challenges, including limited budgets, fewer specialised staff, and more diverse client demands [49]. As a result, the competencies required in SME contexts may differ significantly from those in larger firms, yet they are rarely addressed in existing frameworks [39,44].

Taken together, these barriers underscore that the issue is not simply the acquisition of digital skills, but the systemic and structural obstacles that prevent their diffusion across both persistent expectations gap between academia and professional practice and diverse professional settings. Addressing these barriers requires targeted reforms that acknowledge resource inequalities, faculty capacity, and the differentiated needs of large firms versus SMEs.

RQ4: *What institutional strategies or educational responses have been proposed to address these challenges?*

In response to the barriers identified, the literature proposes a two-pronged strategic approach focused on institutional adaptation.

The first strategy, central to Cluster 2, is comprehensive curriculum modernisation. Reforms emphasise not only standalone courses in ICT and data analytics but also the integration of digital tools, simulations, and case-based learning across core accounting modules. Such reforms are widely advocated and, in some cases, mandated by professional bodies including the AACSB, AICPA, and IMA [35,36,50]. The principle of lifelong learning is consistently highlighted, with calls for continuous professional development to support both graduates and mid-career accountants in upskilling and reskilling. This is seen as essential given the rapid pace of technological change, faculty expertise gaps, and the need for adaptable, future-oriented skill sets [24,32–34,47].

The second strategy involves the proactive guidance of professional bodies, as reflected in Cluster 1. Organisations such as the IFAC and ACCA act as standard-setters, reshaping competency frameworks and ethical guidelines that directly influence both cur-

ricula and professional training. Their initiatives include international auditing standards and codes of ethics [49,51], as well as competency frameworks from bodies like CIMA and IMA, which have explicitly incorporated advanced digital skills [47,50]. Standards such as the AACSB's Standard A7 and the IAESB's IES 2 (2014, 2019) further mandate the integration of technology into accounting education, often under the broad category of ICT [24,36]. By embedding digital competencies into frameworks and examinations, these institutions function as catalysts for systemic alignment between academic training and professional expectations.

Despite these clear strategies, a major limitation emerges: the literature contains far more advocacy than empirical evaluation. Numerous studies recommend curriculum redesign or professional body leadership, yet few provide evidence on how these initiatives concretely improve learning outcomes or professional readiness [32,49]. For instance, while data analytics is frequently recommended for integration into auditing courses, studies reveal that students often fail to fully understand its practical application or long-term impact on the profession [35]. Similarly, the limited research on the relationship between big data competencies and organisational decision quality often assumes effects rather than empirically testing them [32].

This lag is visible in practice. Surveys show that nearly one-third of accounting departments are still at the planning stage or only partially implementing reforms required under standards such as AACSB's A7 [36]. Textbooks, a primary instructional resource, also remain outdated, with authors acknowledging that current editions insufficiently prepare students for data analytics [35]. More broadly, accounting programmes frequently use inconsistent approaches to digital skills integration and lack clear benchmarks for evaluating success [33].

Overall, the literature indicates that institutional strategies, curriculum modernisation, and professional body guidance—though widely endorsed—remain insufficiently evaluated [24]. Future research should move beyond broad advocacy to investigate best practices from institutions that have successfully embedded digital competencies, benchmarking measurable improvements in student learning and professional readiness [36]. Stronger evidence from academic–industry partnerships would provide the empirical foundation needed to validate and refine these strategies [52].

Viewed collectively, the responses to the four research questions provide a comprehensive picture of how digital competencies are currently defined, taught, and applied within the accounting profession [24,38]. Yet, they also expose persistent weaknesses: technical capabilities are often conceptualised in isolation from institutional responsibilities, faculty expertise and curricular integration remain uneven, and ethical and governance frameworks lag behind the rapid diffusion of AI and blockchain [26,43,53]. These shortcomings were further amplified during the COVID-19 pandemic, which accelerated digitalisation across accounting practices and intensified the urgency of aligning educational provision with professional demands [29].

The next Section 5.2 therefore turns to a systematic articulation of the key research gaps that constrain current knowledge and practice, outlining where further inquiry is most urgently needed.

5.2. Identification of Research Gaps

While the preceding synthesis provides a structured understanding of how digital competencies in the accounting profession have been conceptualised, taught, and applied, it also reveals several critical gaps that remain insufficiently addressed in the literature. Across the four research questions, the analysis highlighted recurring patterns of advocacy without rigorous empirical validation, fragmented treatment of technical versus institu-

tional perspectives, and a tendency to focus on large firms while overlooking the needs of small and medium-sized enterprises (SMEs) [31,44]. The COVID-19 pandemic further amplified these weaknesses: the forced acceleration of remote auditing, virtual collaboration, and reliance on cloud and AI tools exposed structural deficiencies in faculty preparedness, curriculum responsiveness, and governance mechanisms [43,54]. These omissions limit the ability of current scholarship to provide a coherent and actionable framework for developing and sustaining digital competencies in practice.

Although recent studies show that contextual AI models (e.g., BERT) can achieve superior performance in detecting accounting fraud from narrative disclosures [26], empirical work remains limited on how such tools can be integrated into real auditing practice. These developments reflect a broader wave of emerging technologies in artificial intelligence—particularly large language models (LLMs) and natural language processing (NLP)—that enable deeper semantic understanding of financial narratives. By capturing contextual cues, sentiment, and linguistic anomalies, such models are becoming promising tools for fraud detection, audit analytics, and textual risk assessment in accounting. Nonetheless, integrating them into assurance workflows still requires further research on model transparency, data governance, and professional accountability.

Furthermore, while existing literature increasingly acknowledges the importance of ethical judgement in accounting, there remains a shortage of empirical work on how practitioners can operationalise algorithmic accountability in practice. Recent scholarship highlights that the problem is not only technical but also conceptual, as AI systems often operate through algorithmic self-referentiality, generating opaque feedback loops that undermine explainability and governance [55]. This underscores the urgency of developing accounting-specific frameworks that address bias, privacy, and accountability beyond generic AI ethics discussions.

Accordingly, this section identifies and organises the most salient research gaps, which not only shape the boundaries of existing knowledge but also indicate promising avenues for future inquiry.

1. Faculty Competence and Continuous Professional Development in New Technologies.

Cluster: Core Competencies and their Technological Drivers; The Educational Response and Curriculum Development.

A persistent research gap concerns the limited competence of accounting faculty and the absence of structured professional development in emerging technologies such as data analytics (DA), artificial intelligence (AI), and blockchain [36,48]. Although accrediting bodies such as the AACSB mandate the integration of technology into accounting curricula, departments face enduring challenges in maintaining faculty expertise [36,48]. Studies highlight that the effectiveness of incorporating data analytics into teaching is often constrained by insufficient faculty knowledge and weak institutional support [48]. This problem is further compounded by pedagogical approaches that lag behind technological change; for example, some accounting information systems (AIS) courses continue to emphasise spreadsheets rather than contemporary applications such as XBRL, cybersecurity, ERP, SAP, or blockchain [24].

This lack of faculty readiness also perpetuates the broader "expectations gap" between the digital skills taught in universities and those demanded by the profession [47]. Even when curricular reforms are initiated, their impact is diluted if educators lack the expertise to deliver advanced content effectively [34]. Importantly, this gap is not limited to specific regions but reflects a systemic challenge across accounting education globally, pointing to institutional weaknesses in faculty training and investment [36]. Unless addressed, this deficiency threatens to undermine curriculum reform efforts and will continue to leave graduates underprepared for a data-driven professional environment [32,47,52].

The pandemic further highlighted this issue: during the sudden shift to online delivery, many faculty lacked the digital competence to transition effectively, demonstrating that professional development must not only keep pace with technological change but also prepare for unforeseen disruptions such as COVID-19 [28,29].

2. Comprehensive Curriculum Integration and Practical Application of Emerging Technologies.

Cluster: The Educational Response and Curriculum Development.

A second major research gap lies in the inconsistent and often inadequate integration of emerging technologies and practical application skills into accounting curricula [35,48]. Despite pressures from professional bodies and accrediting organisations such as the AACSB to embed data analytics and digital technologies, universities retain considerable discretion over "if and how" to implement these changes. This autonomy has led to uneven and sometimes superficial adoption across institutions [48]. Reviews of audit textbooks reinforce this pattern, showing that most provide only cursory mention of data analytics rather than comprehensive coverage with practical exercises or exposure to industry-standard software [35]. As a result, students frequently graduate without the applied competencies expected by the profession [24,34,35].

Curricula also lag behind professional requirements in terms of content and focus. While many programmes continue to prioritise foundational but increasingly outdated topics, they often neglect advanced areas such as predictive analytics, data relevance and reliability assessment, and hands-on training with leading technologies—including large language models (LLMs) and generative AI [24,35]. This mismatch between academic provision and professional demand underscores the persistence of an "expectations gap."

Furthermore, the degree of integration varies significantly across institutional contexts. Elite universities and well-funded programmes may begin to incorporate emerging technologies, while smaller or regionally focused institutions often struggle due to cost constraints, lack of expertise, or limited access to digital infrastructure [24]. This disparity risks creating uneven graduate preparedness within the profession, reinforcing structural inequalities in the labour market [48]. Another underexplored issue is the assessment of digital competencies: while some programmes introduce new tools, there is little evidence of systematic approaches to evaluating whether students can apply these skills in practice [36].

Addressing this gap requires future-oriented curricula that integrate not only technical coverage of emerging technologies but also the development of higher-order analytical, interpretive, and communication skills. Such curricula would ensure that graduates are able to effectively analyse, contextualise, and communicate digital insights, bridging the gap between technological knowledge and its application in professional settings [24,51,56]. The pandemic again served as a stress test, demonstrating that curricula not designed for flexibility were unable to transition effectively into online or hybrid formats, thereby widening disparities in student access to digital learning and skill development [29,53].

3. Ethical Judgement and Robust Governance for AI and Blockchain in Accounting.

Cluster: Ethical Judgement and Professional Responsibilities.

The rapid adoption of AI and blockchain technologies in accounting and auditing introduces complex ethical challenges and exposes a critical research gap in the development of robust governance frameworks [28,41,42]. The profession has not yet established a comprehensive ethical perspective on these technologies, leaving important issues such as data protection and privacy underexplored [27,41]. Existing studies identify a wide spectrum of ethical concerns, including objectivity, algorithmic bias, transparency, data security, privacy, misuse, accountability in system development and use, and the potential effects on human dignity, autonomy, and justice [41,42,57,58].

A further weakness lies in the absence of clear guidance on how to manage the ethical implications of AI-augmented decision-making. Key questions remain around auditors' potential overreliance on AI outputs, the integrity and reliability of data used to train models, and the assignment of accountability for technology-driven decisions [43,45]. Although high-level principles exist, comprehensive standards and auditing frameworks for AI and blockchain remain at an early stage of development, with limited actionable measures to ensure compliance and responsible application [40,43,49,59].

This gap is compounded by the uneven pace at which ethical issues are being addressed across institutional and geographical contexts. While some professional bodies have begun to issue broad ethical guidelines, there is little evidence of convergence on specific standards that can be operationalised in practice [41]. Furthermore, most studies remain conceptual, with limited empirical evidence on how auditors or firms actually manage ethical risks in real-world AI- or blockchain-based systems [32]. The lack of practical case studies and comparative research weakens the profession's ability to anticipate emerging risks and undermines confidence in existing frameworks [47].

Taken together, the literature reveals a pressing need for research that interrogates not only the principles but also the practical mechanisms of ethical governance in technology-enabled auditing [41]. Unless these gaps are addressed, there is a risk that the rapid integration of AI and blockchain will outpace the development of appropriate safeguards, undermining both public trust and the credibility of the accounting profession [59]. The urgency of this issue was heightened during the pandemic, when accelerated digital adoption left little time for ethical reflection, leading to instances where data privacy and cybersecurity were compromised under pressure to maintain remote operations [60,61].

4. Business Value Creation and Practical Implementation Challenges of Digital Transformation. Cluster: The Professional Context and Digital Transformation.

A significant research gap exists in understanding how organisations can effectively translate the potential of digital transformation technologies—such as big data, AI, and blockchain—into tangible business value, and how to overcome the practical challenges of their implementation [50,51]. While the anticipated benefits of these technologies, including efficiency gains and improved decision quality, are widely acknowledged, empirical evidence on their direct influence on firm-level outcomes remains limited [31,50,51]. Many organisations continue to invest heavily in digital transformation initiatives yet struggle to realise measurable returns, often due to persistent obstacles such as funding constraints, data integration problems, resistance to change, and the absence of coherent implementation strategies [25,32,50,61].

This shortfall highlights the need for more granular research into how organisations measure and capture the value generated by digitalisation, particularly in management accounting. For instance, the extent to which advanced data analytics techniques—such as predictive analytics—are actually deployed in practice is rarely documented [33]. Existing studies tend to discuss the promise of such tools but fall short of examining their adoption, utilisation, and performance impact in specific organisational contexts. In addition, little is known about the long-term cost–benefit trade-offs of these technologies, or the organisational capabilities required to sustain them.

Another underexplored dimension concerns the conditions for successful or failed adoption. Research has yet to provide systematic evidence on the interplay of strategic investments, appropriate software selection, and the use of expert resources as determinants of success [25,45]. Moreover, the role of management accountants in ensuring data quality is insufficiently examined, despite widespread recognition that reliable data underpins the effectiveness of AI- and blockchain-based systems. Studies call for deeper investigation into how professionals integrate internal and external datasets, establish standards for

data reliability, and safeguard against data quality risks that can undermine decision-making [33,39,57].

Taken together, these gaps underscore the need for more practical, empirically grounded research that moves beyond abstract claims of efficiency to provide actionable insights. Without such evidence, organisations risk treating digital transformation as a symbolic investment rather than a strategic driver of value creation [31,33]. The profession therefore requires robust case-based and comparative studies to clarify the pathways through which digital technologies can be harnessed to achieve concrete and sustainable business outcomes [38,61]. The pandemic context reinforced this issue, as many firms adopted digital tools hastily for continuity but struggled to measure returns or implement them strategically, suggesting that future scholarship should examine digital value creation under crisis as well as stable conditions [28,46].

5. Empirical and Interdisciplinary Research on Specific Technology Applications and Human-Technology Interaction.

Cluster: Core Competencies and their Technological Drivers; The Professional Context and Digital Transformation.

The literature reveals a persistent demand for more granular, empirical, and interdisciplinary research that moves beyond conceptual reviews to examine specific technology applications and the nuanced interaction between human expertise and digital systems [42,50]. Current scholarship often lacks in-depth analyses of how particular AI and machine learning (ML) techniques are applied to concrete accounting tasks—such as fraud detection, audit analytics, or predictive modelling—and how hybrid systems shape professional practice when human judgement interacts with automated processes [26,57,62]. For example, the use of textual information from financial reports for fraud detection remains scarce, with few models capable of capturing the deeper semantic meaning of narratives or preserving contextual cues that are critical for reliable analysis [26].

Equally underexplored are the challenges of human–technology interaction. Research highlights the risks of cognitive overload, the potential for algorithmic bias (e.g., when ML models privilege "model-friendly" data over economic reality), and the opacity of "black-box" models [43,55]. These issues highlight the urgent need for developing explainable AI frameworks that allow professionals to interrogate automated outputs while retaining accountability for decision-making.

Interdisciplinary approaches are particularly important in this domain. Studies suggest that individuals with atypical cognitive profiles, such as those with autism spectrum disorder (ASD), may demonstrate unique strengths that could be advantageous for highly specialised tasks like cybersecurity monitoring or advanced data analytics. Such findings challenge conventional assumptions in judgement and decision-making (JDM) research and highlight the potential value of diversifying talent pipelines in technology-intensive areas of accounting [62].

Finally, the literature identifies a gap in understanding how variations in data quality influence the reliability of ML-driven forecasting and other analytic outputs [33,57,62]. Since accountants often work with heterogeneous datasets drawn from multiple sources, research must move beyond technical optimisation to address how data integrity, contextualisation, and interpretation affect trust in automated systems.

Taken together, these omissions emphasise the need for richer empirical studies and interdisciplinary perspectives that can capture both the technical implementation and the human-centric dimensions of emerging technologies [32]. Without such evidence, the field risks advancing a narrow, tool-driven discourse that underestimates the complex realities of human–technology interaction in professional accounting contexts [30,60]. The pandemic further highlighted the salience of this issue, as the shift to remote digital platforms

altered interaction patterns between humans and systems, creating new challenges in trust, workload distribution, and cognitive adaptation that remain underexplored [53].

5.3. Synthesis of Research Gaps

Viewed holistically, the five identified gaps demonstrate that the discourse on digital competencies in accounting is still in a formative stage. Across the clusters, the literature calls for greater faculty preparedness and continuous professional development, more coherent and practice-oriented curricula, stronger ethical and governance frameworks for AI and blockchain, clearer evidence on how digital transformation translates into business value, and richer empirical studies on human–technology interaction. While each gap highlights a specific area of weakness, they collectively reveal a systemic challenge: the field remains fragmented, with advocacy outpacing empirical validation and professional standards struggling to keep pace with technological realities. Addressing these gaps will require coordinated efforts from academia, professional bodies, and industry, and creates a clear research agenda that the following section explores in terms of its theoretical and practical implications. Importantly, the COVID-19 pandemic acted as both a catalyst and a magnifying lens for these gaps, accelerating the adoption of FinTech-enabled practices while exposing the fragility of existing systems. This dual role underscores the urgency of addressing the identified deficiencies to build a more resilient accounting profession capable of adapting not only to technological change but also to future crises.

5.4. Implications for Theory and Practice

For professional bodies, the findings highlight the necessity of moving beyond high-level ethical principles toward the development of actionable standards for algorithmic accountability. The adoption of contextual language learning models for fraud detection illustrates how auditors must increasingly acquire competencies in interpreting AI-driven textual analytics [26]. This challenge is compounded by the phenomenon of algorithmic self-referentiality, whereby AI systems evolve on the basis of their own prior outputs, rendering conventional auditing approaches inadequate for ensuring transparency [55]. Accordingly, accounting standards must integrate governance mechanisms that guarantee explainability, fairness, and auditability in AI-enabled decision support systems.

5.4.1. Theoretical Implications

The findings of this review contribute substantively to theory by reframing digital competencies as a form of professional capital within the accounting profession [32,47,50,63]. From the perspective of Human Capital Theory, education and skill acquisition are investments that enhance productive capacity; the evidence here extends this logic into the FinTech era by showing that technical fluency (e.g., data analytics, AI, blockchain) must be coupled with socio-ethical intelligence (e.g., data privacy, scepticism, accountability) [30,64]. This dual requirement challenges older models of human capital that assumed a primarily technical orientation, highlighting instead the need for integrated frameworks that account for both technological mastery and ethical governance [33,46].

The cluster analysis further emphasises that competencies should be viewed as institutionally embedded, rather than as individual attributes alone [39,61]. For example, Cluster 1 (Professional Context and Digital Transformation) illustrates how professional bodies act as institutional gatekeepers, shaping competency agendas through certification and regulatory frameworks [24,43]. This aligns with Institutional Theory, which suggests that professions evolve in response to normative and coercive pressures from powerful organisations [24,30,39]. At the same time, the tension between instrumental and institutional framings of competencies (RQ2) reveals a bifurcation in the literature—technical

proficiency is often considered separately from institutional responsibility, with limited attention to their interplay [34,47,60].

Taken together, the review advances theoretical understanding by conceptualising digital competencies as both individual human capital and institutionalised professional capital, positioned at the intersection of technological innovation and ethical responsibility. This dual lens offers a more holistic framework for analysing how professions adapt to disruptive technologies, moving beyond narrow definitions of skill acquisition [39]. The COVID-19 pandemic further reinforced this conceptual expansion: the abrupt transition to remote audits, digital collaboration platforms, and cloud-based reporting systems illustrated that digital competence must be understood not merely as an outcome of gradual evolutionary adaptation, but also as a vital resilience-building resource [53,58]. In this sense, the pandemic functions as a natural experiment, demonstrating how external shocks can accelerate the theoretical reconfiguration of professional capital and redefine the boundaries of competence in practice [65].

5.4.2. Practical Implications

The synthesis also yields actionable insights for key stakeholders across education, professional bodies, and practice.

For educators, the evidence strongly supports curriculum modernisation that goes beyond superficial technology integration [24,34,36]. Accounting programmes must embed digital tools, simulations, and case-based exercises across core modules to provide hands-on experience with industry-standard software [35,48]. At the same time, faculty require sustained continuous professional development to close the competence gap in emerging technologies such as AI and blockchain [32,36,46,56]. Collaborative models—such as joint industry–university teaching initiatives or the recruitment of guest lecturers with specialist expertise—may help ensure that curricula remain aligned with professional realities [31,36].

For professional bodies, the findings highlight the need to translate broad standards (e.g., AACSB A7, IAESB IES 2) into concrete and measurable competency frameworks [24,34,47]. Beyond issuing calls for digital integration, organisations such as IFAC, AICPA, and ACCA should invest in empirical evaluations of whether reforms deliver measurable improvements in graduate preparedness and professional readiness [36,43,56]. They also play a critical role in setting ethical guardrails for AI and blockchain adoption, requiring the development of specific auditing standards, guidance on algorithmic accountability, and mechanisms for safeguarding data privacy [37,38,49,65].

For accounting firms, the evidence underscores the importance of building environments where digital competencies are continuously developed and operationalised [32,44,60,65]. Firms must invest in structured training that develops both technical [43] and ethical competencies [46,58], ensuring staff can interpret AI outputs, detect biases, and integrate diverse datasets for reliable decision-making [42]. In professional practice, auditors increasingly engage with AI-supported anomaly detection systems that require both technical validation and ethical discernment when interpreting algorithmic outcomes. These situations exemplify how digital competence now extends beyond tool proficiency to an understanding of model behaviour and its implications for audit evidence. Importantly, SMEs—often overlooked in the literature—require tailored interventions that account for resource constraints [61,65], including shared training platforms, regional partnerships, and subsidised access to digital infrastructure [31,45,65].

In practice, the overarching implication is that digital competencies should be treated not as optional enhancements, but as core professional requirements [62,65]. Addressing the gaps identified—faculty readiness, curriculum integration, ethical governance, business value creation, and human–technology interaction—demands coordinated efforts

across academia, professional bodies, and industry [39,47]. Without such alignment, the profession risks perpetuating the very "expectations gap" this review has consistently identified [34,56,62].

Taken collectively, these theoretical and practical implications highlight the urgent need for a coordinated, multi-level response to digital transformation in the accounting profession. By positioning digital competencies as both human and institutional capital, this review not only refines the conceptual foundations of the field but also underscores the actionable steps required to bridge the persistent expectations gap [47,48]. The interplay between education, professional bodies, and industry emerges as the critical axis on which the profession's digital readiness depends [34,35,56]. Building on these insights, the following conclusion distils the contributions of this review and sets out a forward-looking research agenda to guide future scholarship and professional practice [24].

6. Conclusions and Future Research

This review has provided a comprehensive synthesis of scholarship on the digital competencies required within the accounting profession in the FinTech era, focusing on the post-pandemic period (2020–2025). By integrating the PRISMA framework with bibliometric mapping and thematic content analysis, this study has generated a structured understanding of how competencies are defined, taught, and applied across professional, educational, technological, and ethical dimensions. This mixed-method approach has ensured both methodological rigour and conceptual depth, offering a consolidated view of the field's evolution over the past five years.

The analysis revealed four dominant thematic clusters: the professional context and digital transformation, the educational response and curriculum development, core competencies and their technological drivers, and ethical judgement and professional responsibilities. These clusters highlight that the profession's digital transformation is not confined to technical adoption but also encompasses institutional adaptation and socio-ethical responsibility. The temporal evolution further demonstrates that scholarship has shifted from broad explorations of digital transformation to more nuanced examinations of advanced technologies, ethical governance, and human–technology interaction. This evidence highlights that digital competencies operate simultaneously as individual capabilities and as organisational attributes embedded within professional systems.

In the aftermath of COVID-19, the findings underscore that digital competencies are no longer optional enhancements but fundamental professional requirements. The pandemic acted as both a catalyst and a natural stress test, demonstrating that digital readiness determines not only competitiveness but also organisational continuity in periods of disruption. Accordingly, digital proficiency must be theorised as a cornerstone of resilience—an essential component that enables the accounting profession to maintain trust, quality, and ethical integrity while adapting to accelerated technological change.

6.1. Contributions and Limitations

This study contributes in three important ways. First, it offers one of the most recent systematic reviews of digital competencies in accounting, capturing the unique dynamics of the post-pandemic period. Second, it advances theoretical understanding by positioning digital competencies as both human and institutional capital, thereby extending Human Capital Theory and Institutional Theory into the FinTech context. Third, it delivers actionable insights for educators, professional bodies, and firms, highlighting the need for curriculum reform, continuous professional development, and updated competency frameworks to align with technological and ethical realities.

Nevertheless, this review has limitations that should be acknowledged. The restriction to ABS-ranked journals (level 2 and above) and English-language publications may have excluded relevant regional and non-English perspectives, particularly from developing economies where digital skill gaps are acute.

Similarly, the timeframe of 2020–2025, while deliberately focused on capturing post-pandemic acceleration, excludes earlier studies that may provide historical depth. Finally, while this review identifies major themes and gaps, the literature itself reveals an imbalance between advocacy and empirical validation, a limitation that constrains the ability to fully assess the effectiveness of proposed reforms.

6.2. Future Research

Looking ahead, future research could extend this synthesis by examining how institutional capabilities and governance frameworks—such as professional standards, regulatory mechanisms, and data or AI ethics policies—shape the adoption of digital competencies in accounting education and professional practice. Comparative analyses across organisational segments (e.g., SMEs, Big Four, and public-sector entities) and across regional contexts would further enrich understanding of how competencies evolve under differing institutional pressures. Interdisciplinary collaborations between accounting scholars, data scientists, and educators could also foster more robust outcome-based assessments and innovative pedagogies for digital-skills integration.

6.3. Concluding Remarks

In conclusion, the digital transformation of accounting is not a distant prospect but an immediate professional reality. The competencies required extend beyond technical proficiency to encompass ethical judgement, institutional alignment, and the ability to navigate complex human–technology interactions. By clarifying what is known, identifying what remains under-explored, and outlining a focused research agenda, this study contributes to shaping both scholarly inquiry and professional development. Ultimately, the resilience and relevance of the accounting profession in the FinTech era will depend on embedding digital competencies at the core of education, regulation, and practice.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Database-Specific Search Strings.

Database	Search String	Limitations
Scopus	TITLE-ABS-KEY((fintech OR "financial technolog *" OR "digital finance" OR "internet finance" OR "e-finance" OR "mobile money" OR "mobile payment *" OR "digital payment *" OR blockchain OR "distributed ledger *" OR DLT OR "smart contract *" OR "robo-advisor *" OR "open banking" OR insurtech OR regtech OR "robotic process automation" OR RPA OR "cloud accounting" OR ERP OR "machine learning" OR "artificial intelligence" OR "big data") AND ("digital competenc *" OR "digital skill *" OR "data liter *" OR "analytics skill *" OR "technology readiness" OR "digital readiness" OR "ICT skill *" OR cybersecurity OR "data governance" OR privacy OR "ethical AI" OR "algorithmic accountability") AND (account * OR auditor * OR "accounting profession" OR "accounting education" OR "financial reporting" OR assurance))	Years: 2020–2025; Language: English; Source type: Journal articles; ABS $\geq$ 2
Web of Science	TS = ((fintech OR "financial technolog *" OR "digital finance" OR "internet finance" OR "e-finance" OR "mobile money" OR "mobile payment *" OR "digital payment *" OR blockchain OR "distributed ledger *" OR DLT OR "smart contract *" OR "robo-advisor *" OR "open banking" OR insurtech OR regtech OR "robotic process automation" OR RPA OR "cloud accounting" OR ERP OR "machine learning" OR "artificial intelligence" OR "big data") AND ("digital competenc *" OR "digital skill *" OR "data liter *" OR "analytics skill *" OR "technology readiness" OR "digital readiness" OR "ICT skill *" OR cybersecurity OR "data governance" OR privacy OR "ethical AI" OR "algorithmic accountability") AND (account * OR auditor * OR "accounting profession" OR "accounting education" OR "financial reporting" OR assurance))	Years: 2020–2025; Language: English; Document type: Article/Review
EBSCO	((TI(fintech OR "financial technolog *" OR "digital finance" OR "internet finance" OR "e-finance" OR "mobile money" OR "mobile payment *" OR "digital payment *" OR blockchain OR "distributed ledger *" OR DLT OR "smart contract *" OR "robo-advisor *" OR "open banking" OR insurtech OR regtech OR "robotic process automation" OR RPA OR "cloud accounting" OR ERP OR "machine learning" OR "artificial intelligence" OR "big data")) OR (AB(fintech OR "financial technolog *" OR "digital finance" OR "internet finance" OR "e-finance" OR "mobile money" OR "mobile payment *" OR "digital payment *" OR blockchain OR "distributed ledger *" OR DLT OR "smart contract *" OR "robo-advisor *" OR "open banking" OR insurtech OR regtech OR "robotic process automation" OR RPA OR "cloud accounting" OR ERP OR "machine learning" OR "artificial intelligence" OR "big data")) OR (SU("financial technology" OR "digital finance" OR blockchain OR "mobile payments" OR "artificial intelligence" OR "big data" OR "cloud computing"))) AND ((TI("digital competenc *" OR "digital skill *" OR "data liter *" OR "analytics skill *" OR "technology readiness" OR"digital readiness" OR "ICT skill *" OR cybersecurity OR "data governance" OR privacy OR "ethical AI" OR "algorithmic accountability")) OR (AB("digital competenc *" OR "digital skill *" OR "data liter *" OR "analytics skill *" OR "technology readiness" OR "digital readiness" OR "ICT skill *" OR cybersecurity OR "data governance" OR privacy OR "ethical AI" OR "algorithmic accountability")) OR (SU("digital competencies" OR "digital skills" OR "data literacy" OR cybersecurity OR "technology readiness"))) AND ((TI(account * OR auditor * OR "accounting profession" OR "accounting education" OR "financial reporting" OR assurance)) OR (AB(account * OR auditor * OR "accounting profession" OR "accounting education" OR "financial reporting" OR assurance)) OR (SU(accountants OR auditing OR "accounting education" OR "financial reporting" OR assurance))	Years: 2020–2025; Language: English; Peer-reviewed journals

The asterisk (*) is a symbol and should immediately precede the period (.) or be placed before the closing parenthesis. The final asterisk at the end is unnecessary.

Table A2. List of Included Studies.

No.	Title	Year	Cluster 1	Cluster 2	Cluster 3	Cluster 4
1	Integrating technology and data analytic skills into the accounting curriculum: Accounting department leaders' experiences and insights	2020	TRUE	TRUE	FALSE	FALSE
2	Protecting a new Achilles heel: the role of auditors within the practice of data protection	2021	TRUE	FALSE	FALSE	TRUE
3	Accountant as digital innovator: Roles and competencies in the age of automation	2021	TRUE	FALSE	TRUE	FALSE
4	Robotic Process Automation (RPA) Implementation Case Studies in Accounting: A Beginning to End Perspective	2021	TRUE	FALSE	TRUE	TRUE
5	A Framework for Auditor Data Literacy: A Normative Position	2021	TRUE	FALSE	TRUE	TRUE
6	Accountant as Digital Innovator: Roles and Competencies in the Age of Automation	2021	FALSE	FALSE	TRUE	FALSE
7	Blockchain and Other Distributed Ledger Technologies: Where is the Accounting?	2021	FALSE	TRUE	FALSE	TRUE
8	Blockchain in the accounting, auditing and accountability fields: a bibliometric and coding analysis	2021	TRUE	FALSE	FALSE	TRUE
9	How well do audit textbooks currently integrate data analytics	2021	TRUE	TRUE	FALSE	FALSE
10	Artificial intelligence based decision-making in accounting and auditing: ethical challenges and normative thinking	2022	TRUE	FALSE	TRUE	TRUE
11	Centres of data appropriation: evidence from a Nordic hotel chain	2022	TRUE	FALSE	FALSE	FALSE
12	Exploring blockchain in the accounting domain: a bibliometric analysis	2022	FALSE	FALSE	FALSE	TRUE
13	Critical analysis of integration of ICT and data analytics into the accounting curriculum: A multidimensional perspective	2023	TRUE	TRUE	FALSE	TRUE
14	The Evolution of Management Accountants' Digital Skills in Industry 4.0: A Qualitative Approach	2023	TRUE	FALSE	TRUE	TRUE
15	Big data and decision quality: the role of management accountants' data analytics skills	2023	TRUE	FALSE	FALSE	FALSE
16	Ethical impact of artificial intelligence in managerial accounting	2023	FALSE	FALSE	TRUE	TRUE
17	From the abacus to enterprise resource planning: is blockchain the next big accounting tool?	2023	TRUE	FALSE	FALSE	TRUE
18	The impact of audit data analytics on audit quality and audit review continuity in Thailand	2023	TRUE	FALSE	FALSE	FALSE
19	Audit technologies used in practice and ways to implement these technologies into audit courses	2023	TRUE	FALSE	FALSE	FALSE
20	Enablers, barriers and strategies for adopting new technology in accounting	2024	FALSE	FALSE	TRUE	TRUE
21	Developing digital competencies of controllers: Evidence from the Netherlands	2024	TRUE	TRUE	TRUE	TRUE

Table A2. *Cont.*

No.	Title	Year	Cluster 1	Cluster 2	Cluster 3	Cluster 4
22	Analytical skills for accounting students in a data-driven job market: Australian evidence	2024	TRUE	TRUE	FALSE	FALSE
23	Emerging digital technologies and auditing firms: Opportunities and challenges	2024	TRUE	FALSE	TRUE	FALSE
24	Accounting fraud detection using contextual language learning	2024	FALSE	FALSE	TRUE	TRUE
25	Algorithmic self-referentiality: How machine learning pushes calculative practices to assess themselves	2024	FALSE	FALSE	TRUE	FALSE
26	Bridging the gap in talent: A framework for interdisciplinary research on autism spectrum disorder persons in accounting and information systems	2024	FALSE	FALSE	FALSE	TRUE
27	Exploring accounting and AI using topic modelling	2024	FALSE	FALSE	TRUE	FALSE
28	The application of continuous audit and monitoring methodology: A government medication procurement case	2024	TRUE	FALSE	FALSE	FALSE
29	Benefits and Drawbacks of Incorporating ChatGPT in Financial Audits	2025	TRUE	FALSE	TRUE	FALSE
30	Evaluating the influencing factors and effects of the digitalization of management control	2025	FALSE	FALSE	TRUE	FALSE
31	Exploring Large Language Models in External Audits: Implications and Ethical Considerations	2025	TRUE	FALSE	TRUE	TRUE
32	Adaptive structural audit processes as shaped by emerging technologies	2025	TRUE	FALSE	TRUE	TRUE
33	Artificial intelligence auditability and auditor readiness for auditing artificial intelligence systems	2025	TRUE	FALSE	TRUE	TRUE
34	Balancing performance and ethics: Navigating visual recognition technology adoption in the auditing industry	2025	TRUE	FALSE	FALSE	TRUE
35	Bridging IT auditors and AI auditing: Understanding pathways to effective IT audits of AI-driven processes	2025	TRUE	FALSE	TRUE	TRUE
36	Challenges and opportunities for artificial intelligence in auditing: Evidence from the field	2025	TRUE	FALSE	TRUE	FALSE
37	The disruption of blockchain technology in accounting: a review of scientific progress	2025	FALSE	FALSE	FALSE	TRUE
38	The accounting profession in the Twilight Zone: navigating digitalisation's sided challenges through ethical pathways for decision-making	2025	TRUE	FALSE	TRUE	TRUE
39	Behavioural Intention to use Artificial Intelligence (AI) among Accounting Students: Evaluating the Effect of Technology Readiness	2025	FALSE	FALSE	TRUE	FALSE
40	Management accounting and artificial intelligence: A comprehensive literature review and recommendations for future research	2025	TRUE	FALSE	TRUE	FALSE

References

1. Palmié, M.; Wincent, J.; Parida, V.; Caglar, U. The evolution of the financial technology ecosystem: An introduction and agenda for future research on disruptive innovations in ecosystems. *Technol. Forecast. Soc. Change* **2020**, *151*, 119779. [CrossRef]
2. Ha, D.; Le, P.; Nguyen, D.K. Financial inclusion and fintech: A state-of-the-art systematic literature review. *Financ. Innov.* **2025**, *11*, 69. [CrossRef]
3. IFAC. *The Accountancy Profession—Playing a Positive Role in Fighting Corruption*; IFAC: New York, NY, USA, 2020.
4. Socoliuc, M.I. The Impact of Digitalization on the Accounting Profession in Romania—A Quantitative Research. *J. Financ. Stud.* **2022**, *8*, 132–154. [CrossRef]
5. Yigitbasioglu, O.; Green, P.; Cheung, M.-Y.D. Digital Transformation and Accountants as Advisors. *Account. Audit. Account. J.* **2022**, *36*, 209–237. [CrossRef]
6. Andreassen, R. Digital Technology and Changing Roles: A Management Accountant's Dream or Nightmare? *J. Manag. Control.* **2020**, *31*, 209–238. [CrossRef]
7. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, J.M.; Akl, E.A.; Brennan, S.E. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ* **2021**, *372*, 71. [CrossRef]
8. Haddad, C.; Hornuf, L. The Emergence of the Global Fintech Market: Economic and Technological Determinants. *Small Bus. Econ.* **2018**, *53*, 81–105. [CrossRef]
9. Frost, J. The economic forces driving fintech adoption across countries. In *The Technological Revolution in Financial Services: How Banks, Fintechs, and Customers Win Together*; University of Toronto Press: Toronto, ON, Canada, 2020; Volume 838, pp. 70–89.
10. Belanche, D.; Casaló, L.V.; Flavián, C. Artificial Intelligence in FinTech: Understanding Robo-Advisors Adoption Among Customers. *Ind. Manag. Data Syst.* **2019**, *119*, 1411–1430. [CrossRef]
11. Darmansyah, D.; Fianto, B.A.; Hendratmi, A.; Aziz, P.F. Factors Determining Behavioral Intentions to Use Islamic Financial Technology. *J. Islam. Mark.* **2020**, *12*, 794–812. [CrossRef]
12. Liêm, N.T.; Tran, S.; Ho, T.H. Fintech Credit, Bank Regulations and Bank Performance: A Cross-Country Analysis. *Asia-Pac. J. Bus. Adm.* **2021**, *14*, 445–466. [CrossRef]
13. Coffie, C.P.K.; Zhao, H.; Mensah, I.A.; Kiconco, R.; Emuron, A.S.O. Determinants of FinTech Payment Services Diffusion by SMEs in Sub-Saharan Africa: Evidence From Ghana. *Inf. Technol. Dev.* **2020**, *27*, 539–560. [CrossRef]
14. Alkhwaldi, A.F.; Alharasis, E.E.; Shehadeh, M.; Abu-AlSondos, I.A.; Oudat, M.; Atta, A.A.B. Towards an Understanding of FinTech Users' Adoption: Intention and E-Loyalty Post-Covid-19 From a Developing Country Perspective. *Sustainability* **2022**, *14*, 12616. [CrossRef]
15. Ghobakhloo, M.; Fathi, M. Corporate Survival in Industry 4.0 Era: The Enabling Role of Lean-Digitized Manufacturing. *J. Manuf. Technol. Manag.* **2019**, *31*, 1–30. [CrossRef]
16. Muryanto, Y.T.; Kharisma, D.B.; Nugraheni, A.S.C. Prospects and Challenges of Islamic Fintech in Indonesia: A Legal Viewpoint. *Int. J. Law Manag.* **2021**, *64*, 239–252. [CrossRef]
17. Naz, F.; Karim, S.; Houcine, A.; Naeem, M.A. Fintech Growth During COVID-19 in MENA Region: Current Challenges and Future Prospects. *Electron. Commer. Res.* **2022**, *24*, 371–392. [CrossRef]
18. Hudaefi, F.A. How Does Islamic Fintech Promote the SDGs? Qualitative Evidence From Indonesia. *Qual. Res. Financ. Mark.* **2020**, *12*, 353–366. [CrossRef]
19. Kodama, W.; Morgan, P.; Azhgaliyeva, D.; Trinh, L.Q. *Financial Literacy and Fintech Use in Family Business*; Asian Development Bank Institute: Tokyo, Japan, 2024. [CrossRef]
20. Tranfield, D.; Denyer, D.; Smart, P. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *Br. J. Manag.* **2003**, *14*, 207–222. [CrossRef]
21. Chartered Association of Business Schools. *Academic Journal Guide 2021*; Chartered Association of Business Schools: London, UK, 2021.
22. van Eck, N.J.; Waltman, L. Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics* **2010**, *84*, 523–538. [CrossRef]
23. Birt, J.; Safari, M.; de Castro, V.B. Critical analysis of integration of ICT and data analytics into the accounting curriculum: A multidimensional perspective. *Account. Financ.* **2023**, *63*, 4037–4063. [CrossRef]
24. Zhang, C.; Issa, H.; Rozario, A.; Soegaard, J.S. Robotic process automation (RPA) implementation case studies in accounting: A beginning to end perspective. *Account. Horiz.* **2023**, *37*, 193–217. [CrossRef]
25. Bhattacharya, I.; Mickovic, A. Accounting fraud detection using contextual language learning. *Int. J. Account. Inf. Syst.* **2024**, *53*, 100682. [CrossRef]
26. La Torre, M.; Botes, V.L.; Dumay, J.; Odendaal, E. Protecting a new Achilles heel: The role of auditors within the practice of data protection. *Manag. Audit. J.* **2021**, *36*, 218–239. [CrossRef]
27. Jayasuriya, D.D.; Sims, A. From the abacus to enterprise resource planning: Is blockchain the next big accounting tool? *Account. Audit. Account. J.* **2023**, *36*, 24–62. [CrossRef]

28. Wang, W.; Vasarhelyi, M.A. The application of continuous audit and monitoring methodology: A government medication procurement case. *Int. J. Account. Inf. Syst.* **2024**, *55*, 100713. [CrossRef]
29. Zhang, L.; Bin Balia, S.S. Digital transformation and corporate audit risk: Mediating effects of auditor behavior. *Financ. Res. Lett.* **2024**, *67*, 105754. [CrossRef]
30. Jackson, D.; Allen, C. Enablers, barriers and strategies for adopting new technology in accounting. *Int. J. Account. Inf. Syst.* **2024**, *52*, 100666. [CrossRef]
31. Steens, B.; Bots, J.; Derks, K. Developing digital competencies of controllers: Evidence from the Netherlands. *Int. J. Account. Inf. Syst.* **2024**, *52*, 100667. [CrossRef]
32. Abbas, K. Management accounting and artificial intelligence: A comprehensive literature review and recommendations for future research. *Br. Account. Rev.* **2025**, 101551. [CrossRef]
33. Askary, S.; Askarany, D. Analytical skills for accounting students in a data-driven job market: Australian evidence. *Account. Res. J.* **2024**, *37*, 635–654. [CrossRef]
34. Blix, L.H.; Edmonds, M.A.; Sorensen, K.B. How well do audit textbooks currently integrate data analytics. *J. Account. Educ.* **2021**, *55*, 100717. [CrossRef]
35. Andiola, L.M.; Masters, E.; Norman, C. Integrating technology and data analytic skills into the accounting curriculum: Accounting department leaders' experiences and insights. *J. Account. Educ.* **2020**, *50*, 100655. [CrossRef]
36. Appelbaum, D.; Showalter, D.S.; Sun, T.; Vasarhelyi, M.A. A framework for auditor data literacy: A normative position. *Account. Horiz.* **2021**, *35*, 5–25. [CrossRef]
37. Secinaro, S.; Dal Mas, F.; Brescia, V.; Calandra, D. Blockchain in the accounting, auditing and accountability fields: A bibliometric and coding analysis. *Account. Audit. Account. J.* **2022**, *35*, 168–203. [CrossRef]
38. Sewpersadh, N.S. Adaptive structural audit processes as shaped by emerging technologies. *Int. J. Account. Inf. Syst.* **2025**, *56*, 100735. [CrossRef]
39. Otero, A.R.; Agu, M. Benefits and Drawbacks of Incorporating ChatGPT in Financial Audits. *Curr. Issues Audit.* **2025**, *19*, 1–8. [CrossRef]
40. Zhang, C.; Zhu, W.; Dai, J.; Wu, Y.; Chen, X. Ethical impact of artificial intelligence in managerial accounting. *Int. J. Account. Inf. Syst.* **2023**, *49*, 100619. [CrossRef]
41. Lehner, O.M.; Ittonen, K.; Silvola, H.; Ström, E.; Wührleitner, A. Artificial intelligence based decision-making in accounting and auditing: Ethical challenges and normative thinking. *Account. Audit. Account. J.* **2022**, *35*, 109–135. [CrossRef]
42. Li, Y.; Goel, S. Artificial intelligence auditability and auditor readiness for auditing artificial intelligence systems. *Int. J. Account. Inf. Syst.* **2025**, *56*, 100739. [CrossRef]
43. Vitali, S.; Giuliani, M. Emerging digital technologies and auditing firms: Opportunities and challenges. *Int. J. Account. Inf. Syst.* **2024**, *53*, 100676. [CrossRef]
44. Kokina, J.; Blanchette, S.; Davenport, T.H.; Pachamanova, D. Challenges and opportunities for artificial intelligence in auditing: Evidence from the field. *Int. J. Account. Inf. Syst.* **2025**, *56*, 100734. [CrossRef]
45. Parra-Domínguez, J.; Sanz Martín, L.; López Pérez, G.; Zafra Gómez, J.L. The disruption of blockchain technology in accounting: A review of scientific progress. *J. Account. Organ. Change* **2025**, *21*, 330–362. [CrossRef]
46. Rîndaşu, S.-M.; Topor, I.D.; Ionescu-Feleagă, L. The Evolution of Management Accountants' Digital Skills in Industry 4.0: A Qualitative Approach. *Oblìk ì Fìnansi* **2023**, *99*, 38–48.
47. Felski, E. Audit technologies used in practice and ways to implement these technologies into audit courses. *J. Account. Educ.* **2023**, *62*, 100827. [CrossRef]
48. Fotoh, L.E.; Mugwira, T. Exploring Large Language Models in external audits: Implications and ethical considerations. *Int. J. Account. Inf. Syst.* **2025**, *56*, 100748. [CrossRef]
49. Franke, F.; Hiebl, M.R. Big data and decision quality: The role of management accountants' data analytics skills. *Int. J. Account. Inf. Manag.* **2023**, *31*, 93–127. [CrossRef]
50. Mohammed Ismail, I.H.; Abdul Hamid, F.Z. A systematic literature review of the role of big data analysis in financial auditing. *Manag. Account. Rev.* **2024**, *23*, 321–350.
51. Lardo, A.; Corsi, K.; Varma, A.; Mancini, D. Exploring blockchain in the accounting domain: A bibliometric analysis. *Account. Audit. Account. J.* **2022**, *35*, 204–233. [CrossRef]
52. Gietzmann, M.; Grossetti, F. Blockchain and other distributed ledger technologies: Where is the accounting? *J. Account. Public Policy* **2021**, *40*, 106881. [CrossRef]
53. Free, C.; Hecimovic, A. Global supply chains after COVID-19: The end of the road for neoliberal globalisation? *Account. Audit. Account. J.* **2021**, *34*, 58–84. [CrossRef]
54. Millo, Y.; Spence, C.; Xu, R. Algorithmic self-referentiality: How machine learning pushes calculative practices to assess themselves. *Account. Organ. Soc.* **2024**, *113*, 101567. [CrossRef]

55. Krishnanraw, J.; Ismail, K. Behavioural intention to use artificial intelligence (AI) among accounting students: Evaluating the effect of technology readiness. *Manag. Account. Rev.* **2025**, *24*, 465–493.
56. Murphy, B.; Feeney, O.; Rosati, P.; Lynn, T. Exploring accounting and AI using topic modelling. *Int. J. Account. Inf. Syst.* **2024**, *55*, 100709. [CrossRef]
57. Tiron-Tudor, A.; Rodgers, W.; Deliu, D. The accounting profession in the Twilight Zone: Navigating digitalisation's sided challenges through ethical pathways for decision-making. *Account. Audit. Account. J.* **2025**, *38*, 990–1018. [CrossRef]
58. Alaskar, M.Z.; Kim, J.R.; Nguyen, T.H.; Rafique, M. Balancing performance and ethics: Navigating visual recognition technology adoption in the auditing industry. *J. Int. Account. Audit. Tax.* **2025**, *59*, 100701. [CrossRef]
59. Li, Y.; Goel, S. Bridging IT auditors and AI auditing: Understanding pathways to effective IT audits of AI-driven processes. *Adv. Account.* **2025**, *69*, 100842. [CrossRef]
60. Akter, M.; Kummer, T.-F.; Yigitbasioglu, O. Looking beyond the hype: The challenges of blockchain adoption in accounting. *Int. J. Account. Inf. Syst.* **2024**, *53*, 100681. [CrossRef]
61. Demek, K.C.; Giunta, B.; Pinsker, R. Bridging the gap in talent: A framework for interdisciplinary research on autism spectrum disorder persons in accounting and information systems. *Int. J. Account. Inf. Syst.* **2024**, *55*, 100712. [CrossRef]
62. Fullan, M.; Rincón-Gallardo, S.; Hargreaves, A. Professional Capital as Accountability. *Educ. Policy Anal. Arch.* **2015**, *23*, 15. [CrossRef]
63. Falloon, G. From Digital Literacy to Digital Competence: The Teacher Digital Competency (TDC) Framework. *Educ. Technol. Res. Dev.* **2020**, *68*, 2449–2472. [CrossRef]
64. Kokina, J.; Gilleran, R.; Blanchette, S.; Stoddard, D. Accountant as digital innovator: Roles and competencies in the age of automation. *Account. Horiz.* **2021**, *35*, 153–184. [CrossRef]
65. Wu, T.-H.; Huang, S.Y.; Chiu, A.-A.; Yen, D.C. IT governance and IT controls: Analysis from an internal auditing perspective. *Int. J. Account. Inf. Syst.* **2024**, *52*, 100663. [CrossRef]