Auditors in the digital age: a systematic literature review

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Abstract
Purpose – This study examines the dynamics of innovative auditing practices in the digital age, with a specific focus on auditor competencies. Within this scope, we highlight the necessity of redefining auditing practices and the essential adaptation required from auditors. The primary objective is to understand comprehensively how auditor competencies can be strengthened to meet the challenges posed by innovative audit practices.

Design/methodology/approach – A Systematic Literature Review (SLR) was conducted to explore this theme, ensuring rigor and credibility in the outcomes. The results emphasize the importance of auditors strengthening professional competencies, embracing technological agility, and promoting ongoing professional development initiatives.

Findings – The triadic framework comprising—Auditor, Auditing Practices, and Digital Audits—forms the basis for innovative audit practices. This manuscript further discusses the transition of advanced technologies, laying the groundwork for the evolution of auditing practices. Through a systematic assessment of the literature, this study develops a framework for innovative, ethically driven, and effective auditing practices, ensuring the occupation’s relevance and value. Future investigations should focus on the ethical implications of automation in auditing practices and develop innovative frameworks tailored to diverse organizational contexts.

Originality/value – The study addresses a contemporary issue by examining the evolving nature of auditing practices considering digital transformation. Practical implications highlight the enhancement of auditor roles in digital transformation, covering ethics, technological adaptation, and continuous development to uphold the profession’s integrity. This focus acknowledges the changing dynamics of business and the growing role of technology in auditing processes.

Keywords Auditor, Auditing practices, Digital, Innovative practices, Professional capabilities

1. Introduction
The digital revolution has transformed professional domains, with auditing emerging as a fast-changing field (Alkabbji, Almubaydeen, Qushtom, & Hamza, 2023). Leading firms like Ernst & Young, Deloitte, PwC, and KPMG have adopted data analytics, automation, and AI to enhance efficiency and effectiveness (Sierra-García, Gambetta, García-Benau, & Ortega-Pérez, 2019). Hence, these advancements emphasize auditors’ need to develop technical proficiency and social skills to meet current challenges (Seethamraju & Hecimovic, 2022).

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Auditors now face opportunities and challenges with AI integration, requiring advanced technical skills, adaptability, and a commitment to continuous learning (Ramesh, 2019). Staying informed about the latest tools, methods, and industry best practices is essential. Thus, addressing these challenges and opportunities with a comprehensive framework for enhancing auditor competencies is paramount.

Our research employs a Systematic Literature Review (SLR) following PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to understand how auditors’ competencies evolve in the digital era. To do so, we designed a Research Question (RQ) – “How do auditor competencies evolve in response to innovative challenges within the digital age?”

This article is organized into seven sections. The first defines auditing within digital transformation and outlines auditor responsibilities. The research design section details the workflow and methodology of this SLR. We then provide an overview of the PRISMA statement. The results section highlights leading countries in this research field and identified categories. The discussion section analyzes these categories based on key determinants. Finally, the conclusion addresses the RQ, discusses limitations, contributions to theory and practice, and suggests future research directions.

2. Innovative audit conception
In the digital transformation era, auditing must adapt to integrating digital technologies that enhance efficiency, flexibility, and innovation within organizations (Liew, O’Leary, Perdana, & Wang, 2022). Consequently, converging traditional audit methods with emerging technologies drives significant changes in auditing practices, improving economy, efficiency, and efficacy (Goto, 2023). When successful, this integration enables auditors to analyze data more effectively, identifying complex patterns that conventional methods might miss.

The innovative adoption of AI technologies allows real-time data processing and pattern learning, adding a predictive dimension to auditing. This raises important considerations around data integrity, privacy, and algorithmic fairness, prompting auditors to address the ethical implications and ensure transparency in these practices.

Regarding innovation audits, the primary aim is to identify strengths and weaknesses, enabling companies to develop and sustain competitive advantages. This future-oriented approach uses both quantitative and qualitative data to highlight performance gaps and inform strategic action plans (Frishammar, Richtnér, Brattström, Magnusson, & Björk, 2019). Figure 1 illustrates the key dimensions of innovation audits:

The essential dimensions of innovation audits are crucial for guiding professional approaches, drawing from past experiences, current observations, and future goals. Focused on ideation, development, and launch phases, these audits pinpoint organizational strengths and weaknesses, offering a strategic framework. They dig into idea generation, development efficiency, and alignment with strategic objectives. By providing practical and strategic guidance, innovation audits serve as dynamic tools for ongoing improvement, guaranteeing that organizations proficiently cross the perpetually changing setting.

Acknowledging the paramount importance of human and financial resources, as well as capabilities in value generation and technology integration, these audits highlight the need for assets to implement innovative strategies effectively (Al-ahdal & Hashim, 2022). The ethos of an innovation culture, emphasizing values like proactivity, risk-taking, dedication, and adaptability, is integral to this process. Additionally, the business model assumes fundamental importance, conceptualized as a cognitive schema explaining how a company creates, delivers, and captures value through exploring business opportunities (Frishammar et al., 2019). However, despite notable progress in this domain, there are still many challenges...
and obstacles in current approaches. Such as the lack of emphasis on the openness and
distributed innovation approach, and the absence of consideration for the significant
influence of digital technologies, especially regarding the necessary competencies and skills
to deal with them. Hence, updating existing frameworks is imperative, given the substantial
influence of openness, servitization, and digitalization on innovation management (Frishammar et al., 2019).

2.1 AI technologies in auditing
In an era defined by the digital and technological revolution, rapid advancements across all
domains demand continuous adaptation, with the integration of AI technologies bringing
about disruptive change (Gooneratne et al., 2020). This transition marks a significant
milestone in auditing practices, with advanced tools emerging to perform activities efficiently
and with reduced risk.

AI, in the domain of auditing, is a hybrid set of technologies that complements and
transforms traditional practices (Lois, Drogalas, Karagiorgos, & Tsikalakis, 2020). It
revolutionizes auditing by blending technologies, overcoming challenges of the digital age to
enhance efficiency and adaptability (Shaikh et al., 2018). Beyond automating simple tasks, AI
has been serving as a strategic partner enabling high-quality processes (Damerji & Salimi,
2021). This redefinition of the concept extends beyond the incorporation of technology into
processes, showing its transformative potential. In this regard, we would like to highlight
some technologies. Machine Learning (ML) has been introducing new dimensions to the
analysis of audit reports by leveraging its capacity to learn patterns from data (Ashtiani &
Raahemi, 2022). Similarly, Deep Learning (DL) has improved the handling of complex data by
simulating the performance of the human brain in deep layers of neural processing
(Bakumenko & Elragal, 2022). The Natural Language Processing (NLP) is another commonly
used technology, which interprets vast volumes of text, facilitating proficient comprehension
and the identification of irregular financial operations (Rudzionis et al., 2022). Finally,
Computer Vision provides contextualized visual analysis (Zaniolo, Garbin, & Marques, 2023).

AI technologies fundamentally reconfigure the auditing profession, challenging tradition
and emphasizing the need to adapt existing standards and AI technologies (Fotoh &
Lorentzon, 2021). Therefore, integrating AI in various stages of the auditing process
optimizes each step, from data collection and risk mitigation to issuing real-time analyzed results. However, it is crucial to emphasize that the auditing profession must confront the challenges addressed thus far by adapting standards and trends and overcoming resistance. (Frey & Osborne, 2017). Overall, AI and automation offer opportunities to focus on higher-value tasks, but the role of the auditor must be rethought in this evolutionary process. The advent of AI-powered auditing signifies a complete revolution, relying on human expertise combined with emerging AI technologies in auditing practices.

3. Research design
We identified the SLR as an essential tool for consolidating available information reliably and accurately, selectively identifying empirical evidence that meets predetermined eligibility criteria and addressing specific research questions. Unlike other methods, the SLR employs explicit and systematic techniques to enhance result reliability and minimize bias (Page et al., 2021). It involves establishing clear research objectives, systematically searching for all eligible studies, assessing the validity of included results, and methodically presenting and synthesizing study characteristics and findings.

The research design, as shown in Figure 2, comprised two principal phases: initially, we conducted the SLR using the PRISMA statement, extracting main categories of auditor competencies and grouping them into nodes (step 1 and step 2); subsequently, we analyzed and discussed the initial nodes and defined the determinants related to the main research concepts (step 3 and step 4).

4. Systematic literature Review–PRISMA statement
As stated, this investigation adhered to the PRISMA guidelines introduced by Moher et al. (2009). PRISMA provides a structured framework for reporting review findings via a four-phase flowchart. Integrating PRISMA into our methodology ensured a consistent, transparent approach, enhancing the study’s robustness and credibility.

Figure 2. Research design and development of work process

Source(s): Authors’ own work
4.1 Search terms and applied criteria
We utilized the Elsevier Scopus database to access a vast repository of peer-reviewed manuscripts, aiming for a comprehensive understanding of the multidisciplinary scope of AI and related fields.

Our selection process followed four distinct phases (Page et al., 2021). First, we identified relevant research in the database. Next, abstracts were analyzed for relevance. This was followed by a full-text assessment, culminating in decisions about eligibility. Aligned with PRISMA’s four-phase flowchart, our methodology began with identifying pertinent keywords to define the theoretical knowledge corpus (identification phase). Documents were then screened using predetermined filters to select the most suitable ones (screening phase). The subsequent phases involved adherence to eligibility criteria (eligibility phase) and inclusion criteria for newly pertinent articles (inclusion phase). Figure 3 shows the PRISMA flowchart based on our database results and applied criteria.

The search was conducted on January 6, 2024, using the terms “Auditor” in the title and “Digital” in the title, abstract, and keywords. This initially yielded 772 documents. During the screening phase, we focused on publications from 2021 to 2023, reducing the sample to 257
records. We then applied filters to include articles in Business, Management and Accounting, as well as Economics, Econometrics, and Finance, resulting in 65 articles. Further refinement by selecting only journal articles ensured higher quality standards, yielding 42 hits. Finally, we included only English-language studies that had reached the final publication stage, resulting in 38 studies.

Using these 38 documents, we conducted a thematic analysis following five steps outlined by Braun and Clarke (2021). First, we comprehensively read and re-read the documents to understand their content. Following, we extracted data into a spreadsheet, noting the title, author, publication year, country, and findings. We then coded the data to identify recurring patterns and connections, forming an initial set of emergent themes. These themes were iteratively refined and aligned with the research objectives. Finally, we synthesized and integrated the findings related to each theme, addressing the study’s research question. This systematic approach provided a comprehensive exploration of the dataset, yielding relevant insights.

5. Results
5.1 General overview – leading countries

The analysis encompassed 38 articles, highlighting their key attributes. Eleven manuscripts have ten or more citations, with the most cited article by Albitar, Gerged, Kikhia, and Hussainey (2021) having 87 citations. Of the 38 articles, nine are from 2021, sixteen from 2022, and thirteen from 2023. Figure 4 shows the countries with the most publications on this topic: the United Kingdom (6), the United States (4), Jordan, Malaysia, and Romania (3 each), and Brazil, Egypt, Germany, Indonesia, South Africa, and Sweden (2 each).

The United Kingdom is a key contributor to the discourse on digital transformation in auditing, focusing on digital tools, innovative practices, and institutional structures (Aquino, Lino, Azevedo, & Silva, 2022). The studies address regulatory proposals for the digital economy and their implications on audit quality, stressing the need for investments in digital technologies (Albitar et al., 2021). The United States also makes significant contributions, examining remote work’s impact, challenges in adopting blockchain, digital transformation in auditing, and automated processes in audits (Eulerich, Pawlowski, Waddoups, & Wood, 2022). In Jordan, studies explore the impacts of emerging technologies related to the Fourth Industrial Revolution (Allbabidi, 2021).

![Figure 4. Documents by country](source="Authors’ own work")
5.2 Overview of the selected categories

To address the research question – “How do auditor competencies evolve in response to innovative challenges within the digital age?” – the next phase involves identifying the most frequently referenced categories related to innovative audit practices and auditor competencies. Using NVIVO for quality and reliability, we conducted a manual coding of the manuscripts (Woolf & Silver, 2017). NVIVO efficiently managed the large dataset, supporting the analysis of initial nodes and cross-referencing key ideas (Bazeley & Jackson, 2019).

The initial nodes—Auditors, Audit, and Digital Audits—were identified using a word cloud, as shown in Figure 5. While these categories are expected due to the applied database filters, the critical aspect lies in the codes that introduce innovative and original insights. The development of constructs through these initial nodes significantly enriches the research outcomes discussed in Section 6.

Following the design of the word cloud, we conducted a deeper investigation of the initial nodes to differentiate various contexts. These nodes were divided into three dimensions. The first dimension is the concept of the “Auditor,” referring to professionals who assess and ensure financial and operational compliance (Jeacle & Carter, 2022). The second dimension involves “Auditing Practices,” which are systematic examinations that ensure financial accuracy, operational efficiency, and compliance (Fotoh & Lorentzon, 2023). The third dimension, “Digital Audits,” encompasses the integration of advanced technologies in auditing, transforming traditional practices for enhanced efficiency and adaptability (Betti & Sarens, 2021). After the review process, we identified three main focuses: Auditor, Auditing Practices, and Digital Audits. Table 1 presents the results of the SLR. After the review process, we identified three main focuses: Auditor, Auditing Practices, and Digital Audits. Table 1 presents the results of the SLR.

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Through a more detailed analysis of these initial nodes identified during the review process, we discerned their significance across various scopes within specific dimensions of innovation auditing practices. These initial nodes were subsequently classified and grouped into three dimensions: the first dimension focuses on the auditor as a professional, addressing factors essential for competency development, professional identity, and job satisfaction; the second dimension discusses topics related to Auditing Practices, including the integration of Triple-Entry Accounting (TEA) system, Robotic Process Automation (RPA), and Remote

Figure 5. Word cloud with the main concepts for initial nodes (NVivo software)

Source(s): Authors’ own work
Audit activities; lastly, the third dimension explores the impact of Digital Audits, encompassing aspects related to Quality Reports, Performance Optimization, and Human-AI Interactions.

6. Discussion
6.1 Auditor
A thorough examination of the initial nodes facilitated the delineation of the Auditor dimension (see Table 1), revealing its association with competency development, professional identity, and job satisfaction. Within the contemporary milieu, auditors’ competencies are essential prerequisites for preserving the veracity and efficacy of financial information (Cassia & Magno, 2021). As evaluators of auditing practices, auditors possessing readiness attributes and seeking continuous learning, through the enhancement of their skills, are more likely to succeed in the digital age (Saengsith & Suntraruk, 2022). The proficient identity crafted by auditors relies on fundamental ideas such as professional standards, skepticism, and role perception, guided by principles that promote a critical attitude in evidence evaluation and a deep understanding of their responsibilities.

Auditors are being directly influenced by advanced technologies, particularly in terms of technological agility and professional growth. These skills encompass expanding their expertise, staying updated with technological advancements, and cultivating qualities such as leadership, communication, and problem-solving (Rydzak, Przybylska, Trębecki, & Sellitto, 2023). There is a strong emphasis on continuous investment in professional skills to remain competitive in the market and be prepared for industry changes (Ab Wahid & Tan, 2023).
Another essential determinant relates to competency advancement outcomes, acting as catalysts for successfully conducting auditing activities, driven by auditors’ readiness and proficiency in ethical decision-making (Damerji & Salimi, 2021). Through the analysis of personal outcomes, perceptions about social status and the exploration of innovative possibilities frequently emerge in this field. Table 2 illustrates the determinants of Auditor, emphasizing critical concepts that focus on new trajectories in auditor competencies.

The analysis of the initial nodes revealed essential dimensions characterizing the scope of the Auditor: 1. Enhanced Professional Capabilities: This includes aspects such as professional growth through continuous learning and skill enhancement, as well as technological agility achieved through the expansion of knowledge and competencies and a refined role perception. 2. Competency Advancement Outcomes: This dimension focuses on the state of readiness, reflecting auditors’ intentions to improve competencies and adapt to the work environment, as well as their proficiency in ethical decision-making, guided by professional standards, skepticism, and critical thinking. 3. Personal Outcomes: This encompasses factors like social status, including self-awareness and relationship management, and the exploration of innovative possibilities, encouraging auditors to embrace innovative opportunities in their professional journey.

Hence, auditors’ elevated competencies strengthen their role in audit quality levels, contributing to integrity, ethics, and efficiency in the developed auditing practices. Continuous development, susceptibility to improvement, competency development outcomes, and personal outcomes are indispensable pillars, sculpting auditors poised for the most complex challenges of the modern auditing scenario.

6.2 Auditing practices

In our discussion, we recognize a transformative shift in auditing practices, driven by the integration of advanced technologies to enhance human expertise. However, it is important to understand the most relevant aspects of the auditor’s role and the competencies needed to apply these practices (refer to Table 1).

Within this dimension, the significant emphasis lies on concepts like the Triple-Entry Accounting (TEA) system, a groundbreaking innovation merging traditional accounting principles with blockchain and smart contracts (Sgantzos et al., 2023). This approach aims to enhance the precision and reliability of financial transactions. Through blockchain integration, TEA introduces an added layer of security and transparency to accounting records. The decentralized and immutable nature of blockchain ensures transactions are recorded in an unalterable manner, accessible to all authorized parties, thus fortifying the integrity of financial data (Al Shanti & Elessa, 2023). Moreover, the incorporation of smart

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<td>• Social Status</td>
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<td>• Exploration of innovative possibilities</td>
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Source(s): Authors’ own work
contracts in TEA allows perpetual automation in financial agreement execution, streamlining processes, reducing manual errors and performing an enabling audit based on principles of economy, efficiency, and efficacy. Consequently, the integration of these technologies promotes transparency and traceability, maximizing the ability to verify and audit transactions in a secure and automated environment (Matskiv et al., 2023).

Robotic Process Automation (RPA) arose in the literature as a fundamental part in innovative practices, aimed at revolutionizing and refining accounting processes (Eulerich & Kalinichenko, 2018). Aligned with the principles of optimizing efficiency, RPA involves deploying robots to automate routine tasks (Perdana, Lee, & Mui Kim, 2023). In the scope of auditing, the application of RPA signifies a revolution, through the incorporation of predictive analysis and visualization tools. Moreover, the incorporation of ML and DL empower auditors with comprehensive analytical perceptions, which provides a robust and adaptive framework (Zhang, Abigail, Cho, & Vasarhelyi, 2022). That is, robots can process vast amounts of information swiftly and consistently, enabling a detailed analysis, saving time, and significantly reducing the risk of human errors associated with manual data manipulation (Rahman & Ziru, 2023). Beyond operational efficiency, the introduction of RPA in auditing enables the anticipation of patterns and trends. By freeing auditors from routine tasks, RPA allows them to concentrate on analytical activities, thereby adding greater value to innovative auditing practices. Thus, RPA raises the standard of data analysis, contributing to a more precise, critical, and proactive approach to ensuring the integrity of financial information.

Remote Audit also appeared in the literature as an important advancement in auditing practices, distinguished by the synergy between technology and remote communication (Farcane et al., 2023). This approach became particularly relevant during the COVID-19 pandemic, where technological resources such as video conferences, online collaboration tools, and specialized software were employed to conduct audits remotely, providing a flexible and efficient approach aligned with the needs of the digital era (Albitar et al., 2021). The implementation of Remote Audit enables auditors to conduct detailed procedures without the need for physical travel, reducing associated travel costs, providing flexibility in schedules, and simplifying the response to client needs. Additionally, Remote Audit is especially relevant in global contexts where audit teams may be geographically dispersed (Aquino et al., 2022). By combining technology with remote auditing, organizations can readily adapt to changing work conditions, such as those prompted by unforeseen events or global crises (Barrett, 2022). In this regard, organizations must prioritize investing in infrastructure to establish a robust foundation for efficient resource allocation and to utilize communication platforms efficiently. Table 3 outlines the determinants impacting the dimension of Auditing Practices.

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<td>Determinant 6: Technological Infrastructure</td>
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<td>• Communication Platforms</td>
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Table 3. Determinants of auditing practices

Source(s): Authors’ own work
The analysis of initial nodes within the Auditing Practices domain revealed three additional determinants: 4. Continuous Improvement: This includes robust training programs integrating traditional accounting principles with advanced technologies and fostering proficiency in new communication platforms. Quality control mechanisms, such as adherence to ethical standards and feedback systems, ensure ongoing refinement. 5. Data Analytics Capabilities: Advanced analytics techniques like predictive analysis, powered by ML for optimized detection, and DL for recognizing intricate patterns, enhance efficiency and accuracy in auditing practices. Technological integration further bolsters these capabilities. 6. Technological Infrastructure: Strategic resource allocation optimizes collaboration within audit teams, while the integration of platforms facilitates seamless remote communication, showing the importance of a well-established technological framework.

6.3 Digital audits
The mentioned categories in Digital Audits dimension can be consolidated into three initial nodes (Table 1): quality reports, performance optimization, and human-AI interaction.

In the current context of innovative audit practices, the concept of digital audits arose in the literature as a key aspect to ensure the efficiency and operational reliability of organizations (Allbabidi, 2021). The nexus between quality reports, performance optimization, and human-AI interaction stood out as a crucial approach to address the challenges and trends of the digital era. Moreover, the integration of ML and DL further enriched this transformative process, taking audits to a new era of more substantiated and informed analyses (Tiron-Tudor & Deliu, 2022). Exploring all these elements, it is evident how they contribute to informed and strategic management. Quality reports are the foundation for assessment and accountability in digital audits. Emphasizing transparency became crucial to explain organizational practices, providing a clear view of operations (Rudzionis et al., 2022). In the context of the Big 4, particularly highlighted by Ernst & Young, it can be argued that these renowned firms are leveraging advanced data analysis technologies, reshaping the way audits are conducted. This redefinition allows companies to focus on high-risk areas and facilitate a smooth transition to increasingly automated and digitized processes (Köktener & Tunçalp, 2021). Through these premises, we frequently see high-quality services, bringing uniformity to the developed processes and enhancing efficiency at all levels.

In the pursuit of operational excellence, performance optimization unfolds across various essential dimensions. Thus, Key Performance Indicators (KPIs) also play a prominent role in innovative audit practices, by providing a continuous assessment of organizational performance. Simultaneously, fraud detection techniques are integrated to reinforce financial and operational security (Kartikasary et al., 2021). The introduction of a competency framework also highlights the significance of collaboration between human expertise and AI technologies, highlighting an ongoing commitment to ethical AI use within the organizational structure (Badewi, 2022). Furthermore, the introduction of cloud security assesses compliance, access management, encryption, monitoring, and incident response to protect data and systems. Considering the aforementioned factors, our attention also goes to the strategic frameworks, which are aimed at enhancing performance in the domain of digital audits. Hence, it is quite evident that the relationship between humans and AI is pivotal in the digital era. The continuous evolution and real-time adaptability inherent in ML and DL contribute to the agility of digital audits. These technologies can learn and evolve, ensuring that audit processes stay up-to-date with dynamic changes in organizations and emerging risks. Beyond pushing algorithmic efficiency, effective collaboration underlines the importance of human expertise and continuous learning (Tiron-Tudor & Deliu, 2022). Accentuating this, ethics in AI usage ensures that decisions remain firmly anchored in ethical
principles, fostering a harmonious environment where AI not only complements but also amplifies human competence, catalyzing sustained innovation (Moura de Carvalho et al., 2022). In this context, the continuous integration of human and AI resources is not just a strategic advantage but an imperative necessity to consistently conduct digital audits at the forefront of the digital revolution. Table 4 shows the determinants of Digital Audits.

Examining the initial nodes and understanding how key categories interact, we identified the last three determinants within the Digital Audits: 7. Performance Measurement: Utilization of KPIs to foster collaboration and efficiency in specific areas; Integration of fraud detection techniques such as ML and DL for real-time transaction monitoring. 8. Continuous Monitoring Frameworks: Implementation of anomaly detection alerts powered by ML and cloud security measures; Establishment of risk indicators through monitoring systems to identify potentially risky transactions. 9. Models for Performance Enhancement: Development of customized algorithms focusing on ethical AI usage and competency frameworks; Implementation of real-time monitoring mechanisms combining human expertise with consistency. These determinants form a structured framework to effectively tackle emerging challenges and leverage opportunities in evolving business landscapes.

7. Conclusion
This SLR was conducted with the aim of uncovering strategies for auditors to enhance their competencies in response to emerging trends and challenges, revealing innovative perceptions of the complexities of the modern auditing. The exploration of the three essential dimensions – Auditor, Auditing Practices, and Digital Audits – allowed to convert them into determinants that pave the way for excellence and effectiveness in innovative audit practices. Therefore, these three dimensions are crucial to understanding the required transformations and within the field of Auditing. In the first dimension, the highlighted determinants encompass the reinforcement of professional capabilities, the advancement of competencies, and the attainment of personal outcomes. This nexus implies continuous development, both in professional growth and technological agility, alongside with the incorporation of a state of readiness, exploring innovative possibilities. Regarding the second dimension, the determinants emphasize the importance of continuous improvement, data analytics capabilities, and technological infrastructure. These aspects can be achieved through continuous training programs, the implementation of quality control mechanisms, the use of data analysis with predictive and visualization tools, the integration of ML and DL, and the optimization of resources and communication platforms in auditing practices. In the last dimension, which relates to Digital Audits, the focus is on performance measurement, continuous monitoring frameworks, and models for performance enhancement.

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<td>Digital Audits</td>
<td>Determinant 7: Performance Measurement</td>
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<td>• Fraud Detection Techniques</td>
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<td>Determinant 8: Continuous Monitoring Frameworks</td>
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<td>Determinant 9: Models for Performance Enhancement</td>
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<td>• Customized Algorithms</td>
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<td>• Real-time Monitoring</td>
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Table 4. Determinants of digital audits

Source(s): Authors’ own work
Consequently, a redefinition of KPIs, fraud detection techniques, and the establishment of structures for anomaly detection alerts and risk indicators take center stage. Moreover, the implementation of customized algorithms and real-time monitoring is emphasized. In general, it can be stated that these determinants provide a comprehensive overview of the crucial areas that require improvement to ensure excellence in modern auditing practices.

It can be asserted that auditors find themselves at a crucial crossroads, where the continuous evolution of competencies is inevitably interconnected with the technological revolution. The answer to the RQ lies in the upgrade related to technical skills, critical thinking, human-AI interaction, and ethical decision-making. Auditors prepared to control emerging technologies and cultivate a mindset of continuous learning, are well-prepared to face the innovative challenges of auditing in the digital age. However, it is crucial to acknowledge the limitations of this research. The dynamic nature of the digital environment means that some emerging trends or technologies have not been fully addressed, and we are aware that certain generalizations need to be made cautiously, as auditing practices diverge in other contexts and regions.

Regarding contributions to theory and practice, this study covers the way for further exploration of key competencies of auditors, highlighting the codes that introduce innovative and original information to understand how these competencies intertwine with audit practices. Practical contributions are evident in the clarity provided to enhance the role of auditors in digital transformation. Emphasizing ethical integration, technological adaptation, and continuous development proved the need to elevate the quality of audits and fortify the integrity and effectiveness of the auditing profession. From this perspective, it is suggested that future research deeply explores the ethical impacts of automation in auditing, considering issues of privacy, data integrity, and algorithmic biases. Additionally, exploring innovative audit models aligned with the specific needs of an organization can provide added contributions to increase knowledge in the field.

Hence, this investigation not only addresses the question of how auditors can adapt but also lays the groundwork for innovative, ethical, and effective auditing practices in this digital era. By incorporating these findings into practice, the auditing profession can prosper, remaining relevant and valuable in an increasingly digitalized world.

References


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