THE IMPACT OF DIGITALIZATION, AUDITOR COMPETENCE, AND INDEPENDENCE ON EXTERNAL AUDIT QUALITY: A SYSTEMATIC LITERATURE REVIEW WITH A REMOTE AUDITING PERSPECTIVE

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Abstrak

Penelitian ini bertujuan untuk menganalisis hubungan antara digitalisasi, kompetensi auditor, dan independensi terhadap kualitas audit dalam konteks remote auditing melalui pendekatan Systematic Literature Review (SLR) berbasis data sekunder dari artikel jurnal. Sebanyak 20 artikel jurnal nasional dan internasional yang dipublikasikan pada periode 2020–2025 diseleksi dari basis data Scopus, ScienceDirect, Emerald Insight, Google Scholar, dan Sinta menggunakan protokol PRISMA, kemudian dianalisis melalui pendekatan deskriptif serta sintesis tematik dengan bantuan VOSviewer dan Microsoft Excel. Hasil analisis menunjukkan bahwa digitalisasi audit, yang meliputi penggunaan big data analytics, artificial intelligence, cloud-based systems, dan automated audit tools, merupakan faktor kuat yang memengaruhi peningkatan efektivitas dan efisiensi proses audit. Namun, kemampuan auditor dalam mengoperasikan teknologi dan menganalisis data digital terbukti menjadi prasyarat utama agar digitalisasi dapat menghasilkan kualitas audit yang optimal. Selain itu, independensi tetap menjadi elemen fundamental yang menentukan objektivitas auditor di tengah interaksi digital dan pelaksanaan audit jarak jauh. Temuan ini mengonfirmasi bahwa kualitas audit di era digital merupakan hasil interaksi simultan antara teknologi, kompetensi profesional, dan independensi auditor. Penelitian ini memberikan implikasi bagi auditor, kantor akuntan publik, dan regulator dalam memperkuat kapasitas digital serta menjaga integritas profesi di tengah perkembangan audit berbasis teknologi.

Keywords:
Digital Auditing, Auditor Competence, Auditor Independence, Audit Quality, Remote Auditing

Abstract

This study aims to examine the relationship between digitalization, auditor competence, and auditor independence in shaping audit quality within the context of remote auditing by employing a Systematic Literature Review (SLR) based on secondary data from published journal articles. A total of 20 peer-reviewed journal articles published between 2020 and 2025 were retrieved from Scopus, ScienceDirect, Emerald Insight, Google Scholar, and Sinta, selected through the PRISMA protocol, and analyzed using descriptive methods and thematic synthesis with the support of VOSviewer and Microsoft Excel. The findings indicate that digitalization of audits, encompassing big data analytics, artificial intelligence, cloud-based systems, and automated audit tools, serves as a major driver of improved audit efficiency and effectiveness. However, the successful implementation of digital audit technologies relies heavily on auditors' digital competence, including their ability to operate technological tools and conduct data-driven analysis. Furthermore, auditor independence remains a fundamental determinant of audit objectivity, particularly in the context of increased digital interaction and the growing reliance on remote auditing practices. Overall, the results confirm that the simultaneous interaction between technological adoption, professional competence, and auditor independence shapes audit quality in the digital era. This review presents key implications for auditors, audit firms, and regulators on how to enhance digital capabilities while maintaining professional integrity in technology-enabled audit environments.

INTRODUCTION

The development of digital technology has brought fundamental changes to modern auditing practices. Along with the acceleration of digitalization and the impact of the COVID-19 pandemic, auditing activities have undergone a transformation towards remote auditing, which is a remote examination based on digital systems, cloud computing, and data analytics. In Indonesia, more than 60% of Public Accounting Firms (KAP) have adopted digital auditing software (OJK, 2023). Digitalization not only increases the efficiency and speed of examinations but also encourages a paradigm shift in how auditors collect evidence and interact with clients. According to Yoon et al. (2023), digitalization in the context of auditing refers to the integration of digital technologies, such as big data analytics, cloud-based systems, and artificial intelligence, to enhance the efficiency and quality of auditors' decision-making.

Vitali & Giuliani (2024) emphasize that digitization drives structural changes in audit firms through process automation and the use of innovative technology, thereby reducing the risk of human error. Syam et al. (2025) state that digitization is a stage in the transformation of auditing towards the era of smart auditing, which requires the readiness of infrastructure and the digital competence of auditors. Several previous studies (Lugli & Bertacchini, 2022; Li et al., 2024; Castka & Searcy, 2023) have demonstrated that digitization enhances auditor efficiency and productivity, while also creating new challenges, such as the digital divide between firms and risks to independence resulting from the interconnectedness of digital systems with clients. Therefore, digitization can be both a positive and a negative factor depending on the level of readiness and internal control of auditors.

Competence is a crucial factor in the success of digital auditing. Boynton, Johnson, and Kell (2006) define auditor competence as a combination of knowledge, technical skills, and professional abilities necessary to conduct audits effectively. Khulsum et al. (2025) note that high professional competence enables auditors to understand audit risks better and produce quality opinions. Meanwhile, Liang et al. (2025) emphasize that digital competency is now a crucial new dimension in traditional auditor competency, encompassing capabilities in data analytics and assessing the reliability of digital systems.

On the other hand, independence remains a key pillar of the auditing profession. Arens, Elder, and Beasley (2017) define auditor independence as the ability to act objectively and free from the influence of other parties in the audit process. Jenkins & Stanley (2019) assess independence as the foundation of audit professional ethics that guarantees the reliability of financial reports, while DeFond et al. (2024) remind us that in a digital ecosystem, auditors' social connections with clients have the potential to blur independence if not maintained with the principles of professionalism and transparency.

The quality of external audits is the result of integrating auditor capabilities, the effectiveness of procedures, and a commitment to ethical and professional principles. DeAngelo (1981) defines audit quality as the probability that auditors will detect and report material misstatements in financial statements. In the digital context, this definition is expanded to include aspects of technology utilization and digital literacy among auditors (Aunur Rozana et al., 2025). Khulsum et al. (2025) emphasize that competence, time pressure, and audit complexity have a significant effect on audit quality in Indonesia. Meanwhile, research by Miryam Lonto & Pandowo (2025) shows that information technology and auditor competence indirectly improve the effectiveness of internal audits through the mediation of audit quality. Thus, the quality of external audits in the digital era is not only determined by the individual abilities of auditors, but also by the readiness of institutions to adopt technology and maintain professional independence.

This phenomenon shows that digitalization presents new opportunities and challenges for external auditors. Previous studies (Li et al., 2024; Lorentzon et al., 2024) show that remote

auditing increases efficiency but reduces communication between auditors and clients. Furthermore, studies by Khulsum et al. (2025) and Lani Mustika (2023) emphasize the importance of professional competence. However, few have examined the simultaneous relationship between digitization, competence, and independence and their impact on the quality of external audits. Therefore, this study fills this conceptual gap through a literature review approach.

Based on the results of the literature review, several weaknesses in previous studies remain, providing opportunities for further research. Most previous studies were empirical in nature, with limited coverage, and were unable to explain the conceptual relationship between digitization, auditor competence, and independence in depth. In addition, few studies have explicitly explored the perspective of remote auditing, despite this practice becoming an increasingly important part of the auditing profession following the pandemic. Previous studies also tended to focus their analysis on a single variable, such as digitization or competence, without looking at the simultaneous relationship between the three. Therefore, this study was conducted to fill this gap by integrating the three factors, namely digitization, auditor competence, and independence, into a comprehensive conceptual framework. The primary objectives of this study are to examine the impact of digitization on the quality of external audits in the context of remote auditing, to evaluate the role of auditor competence in maintaining audit quality in the digital era, and to understand the influence of independence on audit results in an increasingly digitized environment. This study also aims to investigate the relationship between these three variables as the primary determinants of external audit quality.

Theoretically, this study is expected to contribute to the development of literature on digital auditing by presenting a synthesis of national and international research results, particularly from the perspective of remote auditing. In practical terms, the results of this study are expected to provide insights for auditors, public accounting firms, and regulators on how to strengthen the digital competence of auditors without compromising independence, as well as to optimize the use of technology in remote auditing implementation. In addition, this study can serve as a reference for the academic world in guiding the development of auditor curriculum and training in the digital era.

METHOD

This study employs a Systematic Literature Review (SLR) approach, adhering to the PRISMA 2020 guidelines, to achieve a structured, transparent, and replicable scientific synthesis. SLR was chosen because it is capable of systematically mapping research developments, identifying patterns of findings, and revealing research gaps related to audit digitization, auditor competence, independence, and external audit quality in the context of remote auditing. The SLR process consisted of three main stages: identification, screening, and synthesis of the literature. Throughout the review process, several tools were employed, including Mendeley for reference management, Publish or Perish, and the advanced search features of each database for article retrieval. Microsoft Excel was used for coding and tabulating the dataset, and VOSviewer was utilized for bibliometric mapping and keyword co-occurrence analysis.

In the identification stage, researchers searched for articles in five major scientific databases, namely Scopus, ScienceDirect, Emerald Insight, Google Scholar, and Sinta. These five databases were selected to ensure comprehensive coverage of the literature, with Scopus, ScienceDirect, and Emerald Insight representing leading international outlets in accounting and auditing. At the same time, Google Scholar broadens the search to capture relevant works that may not yet be comprehensively indexed in traditional databases. Sinta guarantees the representation of Indonesian, SINTA-accredited journals, ensuring that the synthesis remains contextually relevant to emerging markets. The search focused on articles published between 2020 and 2025 to capture the latest developments in digital auditing after the pandemic. Keywords were determined using Boolean combinations such as: "digital audit," "audit digitalization," "remote auditing," "auditor competence," "digital competence," "auditor independence," and "audit quality," which were combined with AND and OR operators to broaden the scope of the search.

The screening stage was conducted based on predetermined inclusion and exclusion criteria. The inclusion criteria included peer-reviewed journal articles available in full-text format that

discussed topics relevant to audit digitalization or remote auditing, and were written in English or Indonesian. The exclusion criteria include non-scientific articles, non-academic reports, non-peer-reviewed proceedings, duplicate articles, and articles that are not relevant to the research focus. The screening process involved selecting titles, abstracts, and full-text reviews of articles that had passed the initial selection. The literature screening flow will be presented in the following PRISMA diagram:
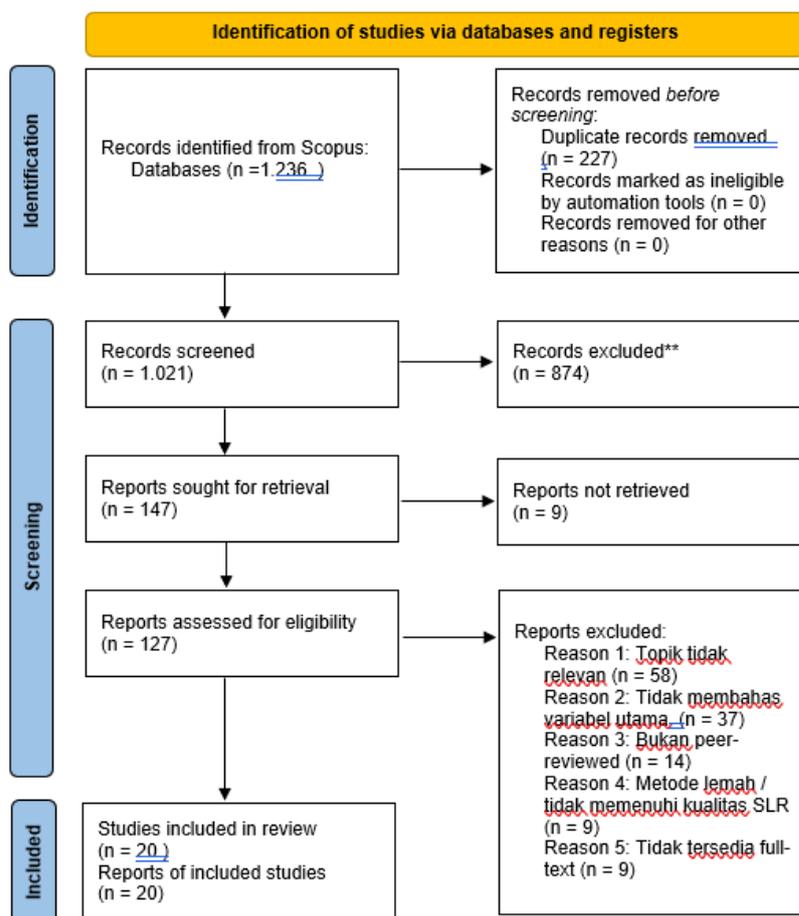

Figure 1. PRISMA Flowchart Diagram

In the synthesis stage, articles that passed the selection process were then analyzed using content analysis and thematic synthesis approaches. Each article was extracted based on author, year, purpose, method, variables, and main findings. These findings were then grouped into broad themes covering: digitization, auditor competence, auditor independence, external audit quality, and remote auditing. The synthesis results were used to identify patterns of relationships between variables, integrate findings across studies, and formulate a conceptual understanding of how digitization, competence, and independence collectively affect external audit quality in a digital audit environment. The validity of the SLR was strengthened through the application of systematic search procedures, layered selection, and documentation in accordance with PRISMA standards.

RESULT AND DISCUSSION

Result

Publication Trends per Year

Publication trends show a consistent increase from 2020 to 2025. In the early period, from 2020 to 2021, the number of publications was still relatively low, as global research was primarily focused on the COVID-19 pandemic and its impact on the audit process. However, the pandemic

actually accelerated the digital transformation in the audit sector, encouraging researchers to explore topics such as audit digitization, auditors' ability to utilize technology, and changes in audit procedures that have shifted to remote auditing.
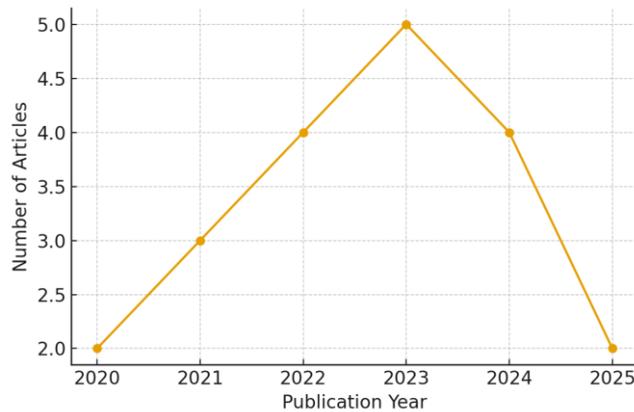

Figure 2. Publication Trend Chart by Year

From 2022 to 2024, there was a significant increase in the number of publications. This surge aligns with the adoption of audit technologies, including data analytics, AI-based audit tools, cloud-based audit platforms, and the automation of testing procedures. During this period, research began to shift from simply introducing technology to analyzing its impact on auditor competence, independence, and the quality of external audits. Several studies have also emphasized the importance of digital competence as a prerequisite for enhancing the effectiveness of modern audit technology.

In 2025, publications continued to show an upward trend, indicating that the issue of audit digitization has not yet reached the saturation point and remains a significant concern in the field of auditing. Regulatory changes, increased cyber risks, and the need for technology-based auditing are driving more empirical and conceptual research that examines the relationship between technological innovation, auditor expertise, and professional integrity. These trends indicate that digitization is no longer an option but has become a new foundation in auditing practices that demand higher competence and stronger independence.

Distribution of Articles by Country

The geographical distribution of the 20 articles reviewed shows that research on audit digitization and remote auditing is more prevalent in countries with high technological readiness. Countries such as the United States, China, Australia, the United Kingdom, and the Netherlands are the main contributors to publications on this topic. The high number of publications from these countries is related to the maturity of digital infrastructure, widespread information technology penetration, and faster regulatory incentives to accommodate digital transformation in the audit sector. This indicates that the development of digital auditing research is primarily driven by developed countries that have a more stable and mature digital ecosystem.
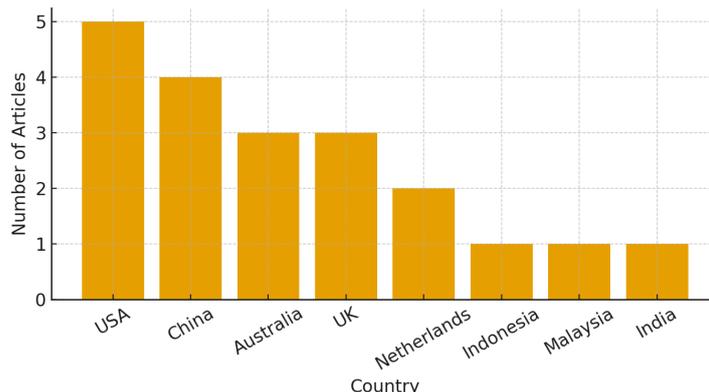
Figure 3. Distribution of Articles by Country

Meanwhile, developing countries such as India, Malaysia, Indonesia, and the Philippines have made more limited contributions. Publications from this region continue to be predominantly focused on conceptual research and surveys, with an emphasis on auditor readiness, challenges in technology adoption, and digital competency gaps. Limited infrastructure, varying levels of auditor digital literacy, and a lack of regulatory support for technology-based auditing are factors contributing to the low volume of publications from developing countries. However, the increasing number of studies in recent years indicates that developing countries are beginning to view audit digitization as a strategic issue.

This distribution pattern indicates that research on digital auditing and remote auditing is not evenly distributed globally. Developed countries are moving faster because they have adequate technological foundations and research resources, while developing countries are still in the adaptation and adjustment stage. This difference in maturity levels presents opportunities for further research, particularly in the context of developing countries, focusing on the implementation of digital auditing, the readiness of auditor competencies, and the strengthening of independence in a technology-based auditing environment.

Co-occurrence Analysis (VOSviewer)

Co-occurrence analysis was conducted using VOSviewer software to map the relationships between keywords from the 20 articles analyzed in this SLR. The mapping results show that several key terms, including digital audit, audit quality, auditor competence, auditor independence, and remote auditing, appear predominantly and form several core clusters. Each cluster represents a conceptual theme that often occurs simultaneously in research, indicating a strong intellectual network between these topics.
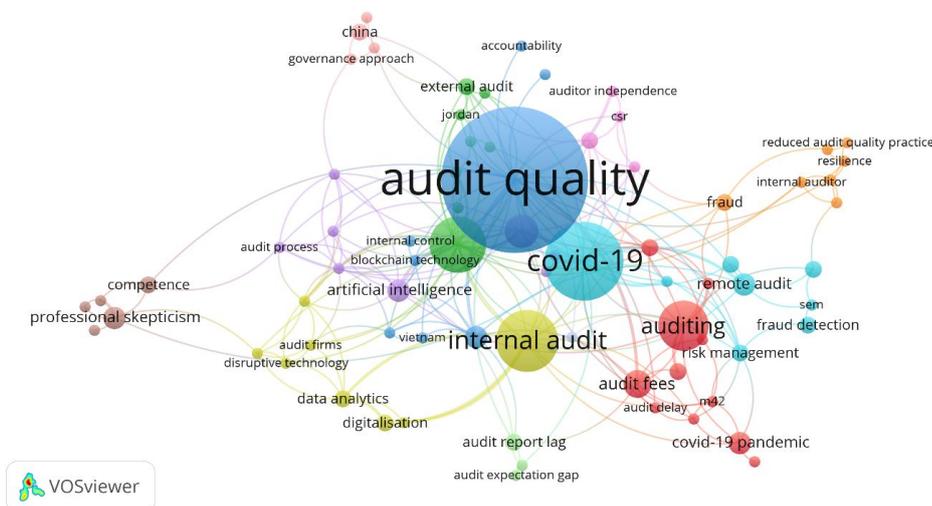
Figure 4. Analisis Co-occurrence Analysis (VOSviewer)

The results of the co-occurrence analysis using VOSviewer, as shown in Figure X, indicate that the term' audit quality' is the node with the highest frequency of occurrence and strength of relationship, thereby making it the center of the research cluster. Other terms, such as COVID-19, internal audit, remote audit, auditing, and artificial intelligence, form closely related clusters, indicating that the pandemic has significantly influenced research on audit quality during the 2020–2025 period, particularly in the implementation of remote auditing and the use of digital technology and artificial intelligence. In addition, the nodes' auditor independence, competence, professional skepticism, and data analytics emerge as supporting factors that enrich the relationships between topics. This network structure shows that research in the field of auditing has shifted from a conventional approach to a technology-based audit ecosystem that emphasizes digital competence, professional independence, and adaptation to pandemic conditions. This visualization also reinforces that audit quality is a central concept that is linked to various elements of technology, auditor behavior, and organizational dynamics.

Research Focus Mapping

Table 1. Mapping of Research Focus

Research Focus	Number of Articles	Percentage
Adoption of Digital Technology in Audit	7 articles	35%
Digital Competence of Auditors	5 articles	25%
Independence in Digital Audit	4 articles	20%
Effectiveness of Remote Auditing	4 articles	20%
Total	20 articles	100%

The mapping of research focus obtained from the SLR results reveals four main domains that are most dominant in the literature related to audit digitization. The primary focus is on the adoption of digital technology in the audit process, which encompasses the utilization of big data analytics, automated audit tools, cloud-based audit systems, and artificial intelligence technology. Studies classified in this cluster emphasize how technology can improve the efficiency, accuracy, and scope of audit procedures. Research in this domain also addresses emerging challenges, including data security risks, infrastructure requirements, and organizational readiness to integrate these technologies into formal audit processes.

The second focus relates to the development of auditors' digital competencies, an area that has received considerable attention with the increasing adoption of audit technology. Research in this category emphasizes the importance of auditors' ability to comprehend information systems, conduct data analysis, operate automated audit software, and assess risks associated with digital systems. These digital competencies are seen as key determinants of the successful implementation of audit digitization. Many studies emphasize that without adequate digital competencies, auditors cannot maximize the benefits of technology and may produce less comprehensive audits.

The third and fourth focus relate to auditor independence in digital interactions and the effectiveness of remote auditing. The emphasis on autonomy highlights new risks that arise in the digital environment, such as familiarity threats due to the intensity of online communication, potential dependence on clients through shared digital platforms, and the challenge of maintaining objectivity in remote audits. Meanwhile, research on the effectiveness of remote auditing assesses how audits conducted without the physical presence of auditors affect audit quality. Studies in this focus have found that remote auditing can improve efficiency, but it also carries the risk of reduced contextual understanding and lower audit evidence quality. Overall, these four focuses form the

conceptual foundation for this SLR synthesis, which affirms that audit quality in the digital era is the result of a harmonious interaction between technology, auditor competence, and professional independence.

Discussion

Digitalization and External Audit Quality

The development of digital technology has brought significant changes to modern auditing practices. Digitalization enables auditors to perform large-scale data analysis in a short period of time through the application of big data analytics, cloud computing, artificial intelligence (AI), and robotic process automation (RPA). Studies by Vitali & Giuliani (2024) and Yoon et al. (2023) confirm that the integration of digital technology improves the efficiency of audit procedures, expands the scope of testing, and reduces manual errors in the examination process.

However, the positive impact of digitization does not stand alone. Liang et al. (2025) highlight that excessive digitization without competency readiness and ethical oversight actually creates new risks, such as data misinterpretation, algorithmic bias, and a decline in auditors' understanding of the client's business context. DeFond et al. (2024) also add that reliance on automated systems can reduce auditors' professional judgment.

Thus, digitization is ambivalent: on the one hand, it speeds up the audit process and increases efficiency, but on the other hand, it can obscure the value of professionalism if strong analytical and ethical skills do not balance it. Therefore, digitization should be understood not merely as a technological tool, but as a paradigm shift that requires a change in auditors' thinking from a traditional approach to smart auditing.

Auditor Competence and Audit Quality

Competence is a key pillar that determines the extent to which digitization can be optimally utilized in external audits. Boynton et al. (2006) state that competence includes technical knowledge, analytical skills, and the professional ability to assess audit evidence objectively. In the digital era, this dimension of competency extends to technological literacy and the ability to manage complex data (digital competence).

Khulsum et al. (2025) found that professional competency has a positive effect on audit quality by improving auditors' ability to detect material errors and assess risks accurately. Meanwhile, Liang et al. (2025) emphasize that digital competence strengthens the effectiveness of modern audit technology, enabling auditors to produce more accurate opinions. Lani Mustika (2023) notes that experience and continuous training enhance auditors' professional skepticism and critical thinking, two key aspects that are particularly important in the context of audit automation.

In other words, traditional and digital competencies cannot be separated; they complement each other. Auditors who are technically competent but lack an understanding of technology will lag in digital audit effectiveness. In contrast, auditors who are technologically proficient but weak in professionalism may compromise their objectivity. The balance between the two is key to producing high-quality audits in the era of digitalization.

Auditor Independence in a Digital Environment

Independence is a moral and ethical element that forms the foundation of public trust in the public accounting profession. Arens, Elder, and Beasley (2017) emphasize that independence means the auditors' ability to act free from external pressure and remain objective in assessing audit evidence. In the digital context, the concept of independence has undergone a more complex shift.

Jenkins & Stanley (2019) argue that independence is now tested not only through personal relationships between auditors and clients, but also through virtual interactions and digital connections that are often informal in nature. DeFond et al. (2024) warn that social closeness in the digital ecosystem can create a "digital familiarity threat," which is the tendency for auditors to lose their professional distance due to overly intense online communication. Additionally, the use of

shared cloud systems between auditors and clients can also pose a risk of conflict of interest if access controls are not strictly enforced.

Thus, maintaining independence in the digital age requires more than just formal compliance with the code of ethics. Auditors must possess a high level of ethical awareness and the ability to assess the impact of digital interactions on the objectivity of their assessments. Audit team rotation, digital access restrictions, and strengthening internal control systems are essential mechanisms for maintaining independence in technology-based audits.

Interactive Relationship between Digitalization, Competence, and Independence on Audit Quality

The literature synthesis reveals that external audit quality is the outcome of a dynamic interplay between digitalization, competence, and auditor independence. Digitalization accelerates the audit process and enriches information, but its effectiveness is highly dependent on the level of competence of auditors in understanding and interpreting digital data. Competence, in turn, determines the extent to which auditors can use technology without violating ethical and professional boundaries.

Carey, Eierle, and Hartlieb (2025) found that the level of satisfaction and expertise of audit staff has a direct correlation with audit quality, especially in the context of using new audit technology. Meanwhile, Khulsum et al. (2025) emphasized that time pressure and audit complexity can compromise the quality of results if auditors lack adequate competence and independence. Conceptually, the relationship between these three factors is synergistic: digitization acts as an enabler, competence as a driver, and independence as an ethical safeguard. The combination of these three factors forms an audit system that is not only efficient but also credible and trustworthy to stakeholders.

Remote Auditing Perspective

The phenomenon of remote auditing is a tangible manifestation of digitalization in audit practices during the post-pandemic era. Castka & Searcy (2023) define remote auditing as an examination process conducted without the physical presence of auditors at the client's location, but rather through video-based online systems, cloud platforms, and data sharing systems. Li, Goel, and Williams (2024) found that this approach can improve efficiency, flexibility, and auditor safety.

However, several studies also highlight the challenges that arise. Barretto et al. (2022) and Lorentzon et al. (2024) demonstrate that although efficiency increases, remote auditing can reduce auditor-client social interaction and compromise the contextual understanding of business processes. In the Indonesian context, research by Trinandari & Pratiwi (2023) indicates that technological gaps and digital competency among auditors continue to hinder the implementation of remote auditing.

Therefore, remote auditing requires a balance between efficiency and depth of analysis. This practice can improve audit quality if it is supported by digitally competent auditors who maintain their professional independence. The implementation of remote auditing also requires the development of new standards in digital audit evidence documentation and the protection of confidential client data.

Final Synthesis and Conceptual Implications

Based on the review of various studies, digitization, competence, and independence are the three main pillars that collectively determine the quality of external audits in the digital era. Digitization creates opportunities for efficiency and transparency; competence strengthens auditors' analytical abilities in dealing with complex data, while independence maintains the objectivity and credibility of audit results.

The three interact in a complementary mechanism: digitization without competence risks lowering audit quality, while competence without independence can lead to professional bias.

Thus, the success of audits in the digital era depends heavily on the synergy between technological intelligence, professional capacity, and the ethical integrity of auditors. Therefore, the future direction of the audit profession should emphasize strengthening auditors' digital literacy, integrating technology-based competency training, and implementing an ethical oversight system that is adaptable to the digital environment. The combination of these three aspects is the foundation for maintaining the relevance and reliability of the audit profession amid the acceleration of global digital transformation.

CONCLUCION

Based on a synthesis of 20 articles using a Systematic Literature Review (SLR) approach, this study concludes that audit digitization has become a major driver of modern audit process transformation. The application of technologies such as big data analytics, cloud-based audit systems, artificial intelligence, and automated audit tools has been consistently found to improve the effectiveness of audit procedures, accelerate testing, and expand the scope of examination. However, these benefits can only be fully realized if auditors possess adequate digital competencies, including data analysis skills, information technology literacy, and an understanding of digital risks. Thus, auditor competency is a key factor that bridges the success of digitalization implementation in producing higher-quality audits.

In addition, auditor independence remains a fundamental pillar in ensuring audit integrity and objectivity, primarily when the audit process is conducted digitally and remotely. Digital platform-based interactions, the use of data sharing systems, and the intensity of online communication have the potential to pose threats to independence, thus requiring the strengthening of professional ethics, internal control mechanisms, and institutional policies that support auditor independence. At the same time, remote auditing has proven effective in improving efficiency and flexibility; however, it presents challenges to the quality of audit evidence and field understanding. Therefore, the effectiveness of remote auditing is highly dependent on the auditor's ability to use technology and maintain objectivity during the examination process.

Overall, the results of this SLR confirm that audit quality in the digital era is the result of the simultaneous interaction between digitization, auditor competence, and professional independence. Digitization provides more sophisticated audit tools and infrastructure; however, an auditor's competence determines the effectiveness of utilizing these technologies, while independence ensures the integrity of the audit results. The conceptual framework resulting from this synthesis provides direction for further research. It offers practical implications for the auditing profession and audit organizations as they face the challenges and opportunities of digital auditing. Future research is recommended to expand the context to developing countries, conduct more comprehensive empirical analyses, and explore other factors that may moderate the relationship between technology, competence, independence, and external audit quality.

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