

The Future of Auditing in the Age of Automation: Leveraging Technology to Enhance Efficiency and Accuracy

Masa Depan Audit di Era Otomasi: Memanfaatkan Teknologi untuk Meningkatkan Efisiensi dan Akurasi

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ABSTRACT

This research discusses the impact of the integration of new technologies such as artificial intelligence (AI), machine learning, and blockchain technology in modern audit practices. The aim is to explore how this technology improves audit efficiency and accuracy as well as the challenges faced in its adoption. The research method uses a systematic approach by collecting the latest literature from international databases using the PRISMA method. The research results show that the adoption of advanced technology in auditing results in improved audit quality, operational efficiency and better risk identification capabilities. Implications of this research include the importance of technical training for auditors, the need for better data security, and challenges related to the costs of implementing new technology in audit firms.

Keywords: automation audit, artificial intelligence, machine learning, blockchain technology, audit efficiency

ABSTRAK

Penelitian ini membahas dampak integrasi teknologi baru seperti kecerdasan buatan (AI), pembelajaran mesin, dan teknologi blockchain dalam praktik audit modern. Tujuannya adalah untuk mengeksplorasi bagaimana teknologi ini meningkatkan efisiensi dan akurasi audit serta tantangan yang dihadapi dalam adopsinya. Metode penelitian menggunakan pendekatan sistematis dengan mengumpulkan literatur terbaru dari database internasional menggunakan metode PRISMA. Hasil penelitian menunjukkan bahwa adopsi teknologi canggih dalam auditing menghasilkan peningkatan kualitas audit, efisiensi operasional, dan kemampuan identifikasi risiko yang lebih baik. Implikasi penelitian ini mencakup pentingnya pelatihan teknis bagi auditor, perlunya keamanan data yang lebih baik, dan tantangan terkait biaya implementasi teknologi baru dalam firma audit.

Kata Kunci: audit otomasi, kecerdasan buatan, pembelajaran mesin, teknologi blockchain, efisiensi audit

1. Introduction

In the era of automation, the future of auditing is predicted to revolutionize this profession by utilizing technology to increase efficiency and accuracy (Lidiana, 2024; Fedyk et al., 2022; Sanusi et al., 2022). Technological developments such as artificial intelligence (AI) and automation provide opportunities for auditors to simplify processes, expand audit scope, reduce processing time, and ultimately improve audit quality. This advocacy is not only expected to increase efficiency, but also improve overall audit quality by allowing auditors to focus on high-level tasks that require judgment and critical thinking (Samiolo, 2023; Fedyk et al., 2022).

Automation in auditing offers various benefits such as improved audit quality, higher efficiency, continuous audit capabilities, and enhanced fraud detection through anomaly detection and predictive analytics (Lidiana, 2024; Fedyk et al., 2022; Sanusi et al., 2022). By leveraging modern data analytics and digital tools, auditors can automate tasks, increase

productivity, reduce errors, and provide greater confidence in the effectiveness of internal controls (Sanusi et al., 2022; Thottoli, 2024). Additionally, the adoption of technologies such as robotic process automation (RPA) and blockchain-based audit platforms is changing audit procedures, making them more precise, flexible, and automated (Rahman & Ziru, 2022; Syahputra, 2022; Parmoodeh et al., 2022).

The COVID-19 pandemic has accelerated the need for automation in auditing, prompting small and medium-sized audit firms to invest in technology to automate processes and train employees with limited IT exposure (Sharma et al., 2022). In addition, the integration of blockchain technology with traditional audit methods is seen as a way to accelerate audit automation and improve audit information processing (Yi et al., 2023). The merger of blockchain technology and AI is anticipated to drive audit automation, marking a significant shift in audit practice towards digitalization and intelligence (Liu et al., 2023). In conclusion, the future of auditing in the era of automation is characterized by the increasing adoption of AI, automation and digital tools to increase audit efficiency and accuracy. By embracing these technological advances, auditors can not only simplify processes and increase productivity, but also improve the quality and effectiveness of audits in a rapidly evolving digital landscape.

In the context of modern auditing, the presence of new technologies such as artificial intelligence (AI), machine learning and blockchain technology promises the potential to increase audit efficiency and accuracy. However, implementing this technology is not without significant challenges for auditors. The main challenges faced are adaptation to rapid and complex technological change, as well as the need to deeply understand how these technologies can be effectively integrated into traditional audit practices. Apart from that, auditors are also faced with challenges related to data security and privacy in the use of automation technology. The research question that arises is: What are the main challenges and opportunities faced by auditors in adopting new technology to improve audit quality? This research aims to fill the existing knowledge gap, namely the lack of understanding of new technology implementation strategies that can optimize audit results by considering technical aspects, data security, as well as relevant social and organizational factors.

The urgency of this research is very important considering the rapid technological changes in the audit industry today. Identifying the challenges auditors face in adopting new technologies, as well as the potential solutions these technologies can offer, is crucial to maintaining the relevance and effectiveness of audit practices. Without a deep understanding of the implementation of this technology, auditors risk falling behind in providing competitive and quality audit services.

The novelty of this research lies in providing new insights into technology adaptation in the audit context. By exploring the latest and in-depth literature, this research will identify the latest trends, best practices, and case studies that illustrate auditors' experiences in facing technological challenges. This will make an important contribution to broadening our understanding of how technology can change the audit landscape.

The contribution of this research will not only be useful for auditors and audit practitioners in improving the quality of their services, but also for regulators and policy makers in adapting regulations to technological developments. Thus, this research will provide practical guidance in facing and utilizing technological changes to improve audit efficiency, accuracy and reliability in the future.

2. Research Methods

Article collection was carried out using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method, which is a systematic approach to identifying and filtering relevant articles from reputable international databases such as Scopus and Web of Science. Keywords used in the search included terms such as "audit automation",

“technology adoption in audit”, “AI in auditing”, and similar, to ensure comprehensive literature coverage on this topic.

Number of articles found and inclusion in the literature review will be clearly noted to provide an idea of the completeness of the literature analysis. Article inclusion and exclusion techniques are based on predetermined criteria, including the relevance of the article to the research topic, the latest year of publication to ensure the freshness of the information, and language (usually English) to facilitate deeper understanding and analysis. Articles that do not meet the inclusion criteria, such as those that do not match the research focus or do not meet established quality standards, will be excluded from this review to ensure the validity and reliability of the research results.

3. Results and Discussions

3.1. Basic Audit Concepts and New Technology

The evolution of technology has had a significant impact on the auditing field, causing transformative changes in audit practices. Technological advances such as data analytics, blockchain technology, robotic process automation, artificial intelligence, and machine learning have fundamentally changed the audit landscape (Ebirim, 2024; Ferri et al., 2020; Thottoli, 2024). These innovations not only automate existing audit procedures, but also encourage the redesign of audit processes to leverage the capabilities of enterprise resource planning systems and other technologies (O'Leary, 2022). The integration of these technologies provides auditors with powerful tools to increase efficiency, accuracy, and the ability to access and analyze large amounts of data to identify risks and issues (Thottoli, 2024).

The adoption of continuous auditing and continuous monitoring, the use of software tools, and the connection between information systems and auditing have become prominent topics in the application of technology in the audit profession (Lamboglia et al., 2020). In addition, the use of advanced audit software has been proven to improve audit quality and meet the increasing demand for more efficient and effective audit services (Alotaibi & Alnesafi, 2023). The use of blockchain technology in auditing shows potential in improving economic monitoring functions, data security, and automated audit processes (Yi et al., 2023; Desplebin et al., 2021).

As digital technology continues to develop and the digitization of data, there is a growing need for auditors to proactively respond to technological evolution to improve their services and adapt to changing market demands (L.K. & O.R., 2023; Lugli & Bertacchini, 2022). Continuous reassessment of security infrastructure becomes important amidst the rapid evolution of technology (Abrahams, 2024). Additionally, the proposed continuous audit framework model that leverages big data analytics highlights the importance of leveraging emerging technologies in financial statement audits (Kroon et al., 2021). In conclusion, the evolution of technology in auditing has brought about significant changes in audit practices, emphasizing the importance of embracing technological advances to improve audit quality, efficiency and effectiveness. Auditors and audit firms need to adapt to these technological changes to remain relevant and meet evolving client needs and regulatory requirements.

3.2. An introduction to new technologies such as AI, machine learning, and blockchain in the context of audit.

The integration of new technologies such as Artificial Intelligence (AI), machine learning, and blockchain in the field of auditing has received significant attention in recent years. These technologies offer a variety of benefits to audit practices, including increased efficiency, improved audit quality, and enabling a more comprehensive audit process. Machine learning, as a subset of AI, has found various applications in auditing, with leading accounting services companies already using it (Dagunduro et al., 2023). In contrast to traditional risk-based audit models, machine learning enables full population audits, reducing audit risks

associated with human factors (Chen et al., 2022). Automation and AI are increasingly taking center stage in audit practice, significantly impacting the profession by increasing efficiency and effectiveness (Lidiana, 2024).

Although the application of AI in auditing is more common in large organizations that utilize large datasets (Ríkharðsson et al., 2022), growing interest is emerging in leveraging natural language processing (NLP) machine learning methods to analyze large amounts of data such as emails, business transactions, and bank statements ("Ethical Dilemma of Using Natural Language Processing (NPL) Machine Learning Method in Auditing Company Internal Communication", 2023). Automation of structured audit tasks through AI has increased audit efficiency and quality (Seethamraju & Hecimovic, 2022). Additionally, the use of advanced data analytics, AI, and machine learning in the audit process has been studied for its effectiveness in evaluating the quality of loan assets in banking (Dawodu, 2023). The application of machine learning techniques in tax audits also aims to prevent tax evasion, addressing significant problems in tax compliance.

Auditors can utilize machine learning to improve anomaly detection, helping identify errors and problems in financial reports (Handoko, 2024). Furthermore, the adoption of AI in auditing is crucial as AI and machine learning systems become increasingly common in decision-making processes, emphasizing the importance of auditing these systems (Shammar, 2024). In conclusion, incorporating AI, machine learning and blockchain technology in audit practices offers a variety of benefits, from increased efficiency and effectiveness to improved audit quality and anomaly detection. As these technologies continue to develop, auditors will need to adapt and adopt them to improve their audit processes and results.

3.3. Main Challenges in Adopting New Technology

3.3.1. Lack of understanding and technical skills among auditors.

Adopting new technology in auditing presents several challenges, including a lack of understanding and technical skills among auditors. These challenges are compounded by factors such as the potential underestimation of the auditor's role in a technology-centric environment, increased information security risks, and ambiguity around liability risks (Muterera, 2024). The transition to new technology is hampered by a shortage of auditors who are skilled and experienced in using technology effectively and efficiently (Dai & Vasarhelyi, 2020). Barriers to adopting robotics in auditing include lack of training, data quality issues, and inadequate investment in robotics technology (Sethibe & Naidoo, 2022).

The adoption of technology in audit firms with the aim of increasing efficiency through streamlining processes and reducing manual activities can lead to workforce reductions (Yusoff et al., 2023). Although auditors have been accustomed to working with computers and IT tools since the 1990s, they have been criticized for being reluctant to adopt new technologies unless urged by clients (Liew et al., 2022). Auditors need to understand and adopt emerging technologies such as cloud computing to increase efficiency in business and auditing processes (Lois et al., 2020).

Auditors must acquire new IT skills and technical knowledge, particularly in areas such as blockchain, to design efficient audit processes, collect accurate evidence, and review systems for potential risks and fraud (Garanina et al., 2021). Using emerging technology tools and software is critical for auditors to improve the quality of audit work and refine their technical skills in facing new challenges (Thattoli et al., 2022). Constantly updating skills, adapting to new technologies, and staying informed about regulatory changes are essential for auditors to remain effective in their role in a rapidly evolving business environment (Mustika, 2023).

Human resource development strategies, including ongoing training, technology empowerment, and critical and analytical skills development, are critical to ensuring that auditors have superior technical skills and become strategic partners who support long-term

company growth (Djogo, 2023). The challenges in adopting new technology are further compounded by factors such as low use of technology in some regions, inadequate auditor training, and the evolving nature of audit standards (Nguyen, 2024). In conclusion, addressing the lack of understanding and technical skills among auditors is a critical aspect in adopting new technologies in the auditing profession. Training programs, skills development initiatives, and a proactive approach in adopting emerging technologies are critical for auditors to overcome these challenges and thrive in a technology-driven audit environment.

3.3.2. Resistance to change from internal parties in the organization.

Resistance to change from internal parties within an organization is a common challenge when adopting new technology. This form of resistance can vary, from simple rejection to strong opposition (Pambudi, 2021). Employee resistance to change is often characterized by their unwillingness to accept and support organizational change, which hinders the implementation process (Patiro, 2024). Understanding the reasons behind this resistance is critical for successful technology adoption ("Organizational change from the perspective of employees: a case study on the reasons for resistance of private sector employees in Kosovo", 2023). Resistance to change can be a significant barrier to the adoption of innovative technologies such as blockchain (Jang et al., 2023).

Research shows that resistance to change can be moderated by factors such as technological competence, organizational justice, communication, and leadership style (Masry-Herzallah & Dor-Haim, 2021; Lizar et al., 2019; Peng et al., 2020; Rehman et al., 2021). For example, transformational leadership has been shown to influence employees' reactions to organizational change, impacting their cooperation or resistance to the implementation of new technologies (Peng et al., 2020). In addition, organizational justice dimensions play an important role in reducing resistance to change by increasing perceived organizational support and readiness to change (Rehman et al., 2021).

Studies also highlight the importance of trust in organizations in relation to resistance to change. Organizational trust indirectly influences employee agility and proactive behavior through its impact on resistance to change (Jager et al., 2021). Additionally, factors such as distributive justice and perceptions of fairness can influence employee resistance to change during organizational transformation (Voet, 2019). In conclusion, overcoming resistance to change in organizations is critical to the successful adoption of new technologies. By considering factors such as leadership style, organizational justice, communication strategies, and trust, organizations can effectively manage and reduce resistance, facilitating the implementation of new technologies.

3.4. Opportunities in Adopting New Technology

3.4.1. Increased operational efficiency through audit process automation.

To increase operational efficiency through audit process automation, audit firms can leverage new technologies such as artificial intelligence (AI), robotic process automation (RPA), and blockchain. These technologies offer opportunities to automate tasks such as data processing, internal audit activities, and improving audit processes through intelligent automation (Thottoli, 2024; Lidiana, 2024). By combining information and communications technology (ICT) and AI, audit firms can improve their processes, which in turn improves audit quality, operational efficiency with reduced staff, and lowers audit costs (Thottoli, 2024). In addition, the integration of knowledge graph technology with cloud-edge collaboration can reduce computing latency, increasing the response speed and efficiency of intelligent audit systems (Zhong, 2024).

Technology integration in the Internal Audit Department is very important to increase operational efficiency, transparency and accountability in modern governance (Ramli, 2024). Programs focused on audit digitalization offer various opportunities for innovation and

improvement in the audit profession (Schreuder & Smuts, 2023). Furthermore, the use of audit technology significantly influences audit work performance, contributing to the efficiency and effectiveness of auditors' work (Noor et al., 2022).

The COVID-19 pandemic has accelerated the need for automation in audit processes, forcing small and medium-sized audit firms to invest in automating processes and training employees with limited IT exposure to weather challenging times (Sharma et al., 2022). Technological advances are expected to improve auditor judgment and potentially automate it in the future, highlighting the transformational potential of technology in the audit profession (Samiolo, 2023). In conclusion, by adopting new technologies such as AI, RPA, and blockchain, audit firms can streamline processes, improve audit quality, reduce manual efforts, and ultimately increase operational efficiency in the audit process.

In the audit space, the adoption of new technology presents significant opportunities to improve the accuracy and timeliness of audit results, thereby providing clients with deeper analysis and insight. Various studies highlight the potential benefits of integrating technologies such as blockchain, artificial intelligence (AI), and digital tools in audit practices. Blockchain technology offers increased transparency, traceability, and reliability in audit trails, allowing auditors to verify the authenticity and integrity of financial transactions (Rudalamun, 2024). The use of advanced audit software and digital tools can increase the efficiency and effectiveness of auditors' work performance, leading to better audit results (Sanusi et al., 2022; Alotaibi & Alnesafi, 2023). Additionally, the adoption of information technology tools such as computer-assisted audit techniques (CAATs) is recognized as contributing to more reliable and high-quality reporting in audits, increasing trust among stakeholders (Vuković et al., 2024; Seethamraju & Hecimovic, 2022).

Studies also show that the integration of new technologies in the audit process can result in automation, wider audit coverage, shorter processing times, and ultimately, better audit quality (علي et al., 2022; Nonnenmacher et al., 2021). In addition, the application of technology such as AI and data analytics can not only improve audit quality but also provide value-added services to organizations (Wassie, 2024).

The COVID-19 pandemic has increasingly emphasized the importance of technological advances in auditing, especially in areas such as continuous auditing and digital audit platforms (Judijanto, 2023). Utilization of technology such as a blockchain-supported audit platform with smart contract functionality shows potential in automating audit procedures and improving data integrity (Syahputra, 2022). In conclusion, the adoption of new technologies in auditing has great potential to revolutionize audit practices, offering increased accuracy, timeliness and depth of analysis in audit results. By leveraging tools such as blockchain, AI, and digital audit platforms, auditors can streamline processes, improve quality, and meet the growing demand from clients seeking more efficient and effective audit services.

4. Conclusions

The integration of new technologies such as AI, machine learning and blockchain has significantly changed audit practices. These advances have not only automated existing audit procedures but also led to the redesign of audit processes to leverage the capabilities of enterprise resource planning systems and other technologies. The adoption of continuous auditing, advanced audit software, as well as connections between information systems and audit processes have become prominent in modern audit practice. These technologies provide auditors with powerful tools to increase efficiency, accuracy, and the ability to access and analyze large amounts of data to identify risks and issues.

4.1. Implications

The adoption of these technologies in auditing has profound implications:

1. **Audit Quality Improvement:** The use of advanced technology enables more in-depth and accurate audits, increasing the reliability of financial reporting and increasing stakeholder confidence.
2. **Operational Efficiency:** Automation reduces manual tasks, speeds up the audit process, and lowers operational costs, allowing audit firms to allocate resources more effectively.
3. **Improved Risk Identification:** Technologies such as AI and machine learning enable better risk assessment and anomaly detection, improving auditors' ability to identify and address potential problems early.
4. **Regulatory Compliance:** Advanced audit tools ensure compliance with evolving regulatory requirements, providing more comprehensive and accurate reporting.

4.2. Limitations

Despite its benefits, several limitations must be considered:

1. **Technical Skills:** There is a significant gap in the technical skills required to utilize this technology effectively, requiring ongoing training and development for auditors.
2. **Data Security:** The integration of new technologies introduces vulnerabilities that can compromise the security and confidentiality of audit data.
3. **Resistance to Change:** Internal resistance from auditors and organizations can hinder the effective adoption and implementation of new technologies.
4. **Implementation Costs:** The initial investment in advanced technology can be huge, posing financial challenges for smaller audit firms.

4.3. Future Research

Future research should focus on the following areas:

1. **Developing Training Programs:** Research on effective training programs to equip auditors with the technical skills necessary to utilize new technology.
2. **Improve Data Security:** Study of improving security measures related to the use of advanced technology in auditing.
3. **Overcoming Resistance to Change:** Examining strategies for managing and reducing resistance to technological change in audit firms.
4. **Cost-Benefit Analysis:** Conduct a comprehensive cost-benefit analysis to evaluate the long-term financial implications of adopting new audit technology.
5. **Regulatory Adaptation:** Explore how regulatory frameworks can adapt and support the integration of new technologies in auditing practice.

By addressing these areas, the audit profession can continue to develop and take advantage of the opportunities offered by technological advances while mitigating the associated challenges.

5. References

Abrahams, T. (2024). Continuous improvement in information security: a review of lessons from superannuation cybersecurity uplift programs. *International Journal of Science and Research Archive*, 11(1), 1327-1337. <https://doi.org/10.30574/ijrsra.2024.11.1.0219>

- Alotaibi, E. and Alnesafi, A. (2023). Assessing the impact of audit software on audit quality: auditors' perceptions. *International Journal of Applied Economics Finance and Accounting*, 17(1), 97-108. <https://doi.org/10.33094/ijaefa.v17i1.1068>
- Chen, Y., Wu, Z., & Yan, H. (2022). A full population auditing method based on machine learning. *Sustainability*, 14(24), 17008. <https://doi.org/10.3390/su142417008>
- Dagunduro, M., Falana, G., Adewara, Y., & Busayo, T. (2023). Application of artificial intelligence and audit quality in nigeria. *Advances in Multidisciplinary & Scientific Research Journal Publication*, 11(1), 39-56. <https://doi.org/10.22624/aims/humanities/v11n1p4>
- Dai, J. and Vasarhelyi, M. (2020). Continuous audit intelligence as a service (caiaas) and intelligent app recommendations. *Journal of Emerging Technologies in Accounting*, 17(2), 1-15. <https://doi.org/10.2308/jeta-10751>
- Dawodu, S. (2023). Advancements in computer-aided audit technologies: impact on loan asset quality in banking. *World Journal of Advanced Research and Reviews*, 20(3), 876-887. <https://doi.org/10.30574/wjarr.2023.20.3.2554>
- Desplebin, O., Lux, G., & Petit, N. (2021). To be or not to be: blockchain and the future of accounting and auditing*. *Accounting Perspectives*, 20(4), 743-769. <https://doi.org/10.1111/1911-3838.12265>
- Djogo, Y. (2023). Internal auditor human resources development strategy in the era of disruption. *Atestasi Jurnal Ilmiah Akuntansi*, 6(2), 627-639. <https://doi.org/10.57178/atestasi.v6i2.723>
- Ebirim, G. (2024). Evolving trends in corporate auditing: a systematic review of practices and regulations in the united states. *World Journal of Advanced Research and Reviews*, 21(1), 2250-2262. <https://doi.org/10.30574/wjarr.2024.21.1.0312>
- Ebirim, G. (2024). Innovations in accounting and auditing: a comprehensive review of current trends and their impact on u.s. businesses. *International Journal of Science and Research Archive*, 11(1), 965-974. <https://doi.org/10.30574/ijsra.2024.11.1.0134>
- Fedyk, A., Hodson, J., Khimich, N., & Fedyk, T. (2022). Is artificial intelligence improving the audit process?. *Review of Accounting Studies*, 27(3), 938-985. <https://doi.org/10.1007/s11142-022-09697-x>
- Ferri, L., Spanó, R., Ginesti, G., & Theodosopoulos, G. (2020). Ascertaining auditors' intentions to use blockchain technology: evidence from the big 4 accountancy firms in italy. *Meditari Accountancy Research*, 29(5), 1063-1087. <https://doi.org/10.1108/medar-03-2020-0829>
- Garanina, T., Ranta, M., & Dumay, J. (2021). Blockchain in accounting research: current trends and emerging topics. *Accounting Auditing & Accountability Journal*, 35(7), 1507-1533. <https://doi.org/10.1108/aaaj-10-2020-4991>
- Handoko, B. (2024). Embracing ai in auditing: an examination of auditor readiness through the tram framework. *International Journal of Computational Methods and Experimental Measurements*, 12(1), 53-60. <https://doi.org/10.18280/ijcmem.120106>
- Jager, S., Born, M., & Molen, H. (2021). The relationship between organizational trust, resistance to change and adaptive and proactive employees' agility in an unplanned and planned change context. *Applied Psychology*, 71(2), 436-460. <https://doi.org/10.1111/apps.12327>
- Jang, H., Yoo, J., & Cho, M. (2023). Resistance to blockchain adoption in the foodservice industry: moderating roles of public pressures and climate change awareness. *International Journal of Contemporary Hospitality Management*, 36(5), 1467-1489. <https://doi.org/10.1108/ijchm-09-2022-1127>
- Judijanto, L. (2023). The effect of regulatory compliance and digital audit adoption on auditor performance and financial reporting accuracy in indonesia. *The Es Accounting and Finance*, 2(01), 77-86. <https://doi.org/10.58812/esaf.v2i01.154>
- Kroon, N., Alves, M., & Martins, I. (2021). The impacts of emerging technologies on accountants' role and skills: connecting to open innovation—a systematic literature

- review. *Journal of Open Innovation Technology Market and Complexity*, 7(3), 163. <https://doi.org/10.3390/joitmc7030163>
- L.K., F. and O.R., L. (2023). Accounting practices in a digitalized world: nigerian perspective. *African Journal of Accounting and Financial Research*, 6(1), 63-82. <https://doi.org/10.52589/ajafr-dwn2co6g>
- Lamboglia, R., Lavorato, D., Scornavacca, E., & Za, S. (2020). Exploring the relationship between audit and technology. a bibliometric analysis. *Meditari Accountancy Research*, 29(5), 1233-1260. <https://doi.org/10.1108/medar-03-2020-0836>
- Lidiana, L. (2024). Ai and auditing: enhancing audit efficiency and effectiveness with artificial intelligence. *COUNT*, 1(3), 214-223. <https://doi.org/10.62207/g0wpn394>
- Liew, A., Boxall, P., & Setiawan, D. (2022). The transformation to data analytics in big-four financial audit: what, why and how?. *Pacific Accounting Review*, 34(4), 569-584. <https://doi.org/10.1108/par-06-2021-0105>
- Liu, L., Su, Y., & Chiang, C. (2023). Research from rpa advancement to ai intelligent automation development: taking the accounting service industry in taiwan as an example., 55-91. <https://doi.org/10.47260/amae/1333>
- Lizar, A., Chrisanty, F., Novita, P., & Endaryono, S. (2019). Minimizing resistance to change: the role of communication and perceived organizational justice.. <https://doi.org/10.4108/eai.6-12-2018.2286328>
- Lois, P., Drogalas, G., Karagiorgos, A., & Tsikalakis, K. (2020). Internal audits in the digital era: opportunities risks and challenges. *Euromed Journal of Business*, 15(2), 205-217. <https://doi.org/10.1108/emjb-07-2019-0097>
- Lugli, E. and Bertacchini, F. (2022). Audit quality and digitalization: some insights from theitalian context. *Meditari Accountancy Research*, 31(4), 841-860. <https://doi.org/10.1108/medar-08-2021-1399>
- Masry-Herzallah, A. and Dor-Haim, P. (2021). Teachers' technological competence and success in online teaching during the covid-19 crisis: the moderating role of resistance to change. *International Journal of Educational Management*, 36(1), 1-13. <https://doi.org/10.1108/ijem-03-2021-0086>
- Mustika, L. (2023). The influence of competence and experience of auditors on audit outcomes. *Golden Ratio of Auditing Research*, 3(2), 82-93. <https://doi.org/10.52970/grar.v3i2.380>
- Muterera, J. (2024). The auditor self-efficacy scale: measuring confidence in technical skills, technological adaptation, and interpersonal communication. *Finance & Accounting Research Journal*, 6(3), 331-346. <https://doi.org/10.51594/farj.v6i3.873>
- Nguyen, P. (2024). Digital transformation in vietnam: the impacts on external auditors and their practices. *Pacific Accounting Review*, 36(1), 144-160. <https://doi.org/10.1108/par-04-2023-0051>
- Nonnenmacher, J., Kruse, F., Schumann, G., & Gómez, J. (2021). Using autoencoders for data-driven analysis in internal auditing.. <https://doi.org/10.24251/hicss.2021.697>
- Noor, N., Sanusi, Z., Johari, R., Al-Dhubaibi, A., Hidayati, A., & Razak, N. (2022). An examination of the utilization of audit technology in influencing audit job performance. *Asia-Pacific Management Accounting Journal*, 17(1), 283-309. <https://doi.org/10.24191/apmaj.v17i1-11>
- O'Leary, D. (2022). Digitization, digitalization, and digital transformation in accounting, electronic commerce, and supply chains. *Intelligent Systems in Accounting Finance & Management*, 30(2), 101-110. <https://doi.org/10.1002/isaf.1524>
- Pambudi, P. (2021). Analysis of user resistance towards adopting e-office: a case from a governmental organization. *Indonesian Scholars Scientific Summit Taiwan Proceeding*, 3, 1-7. <https://doi.org/10.52162/3.2021105>
- Parmodeh, A., Ndiweni, E., & Barghathi, Y. (2022). An exploratory study of the perceptions of auditors on the impact on blockchain technology in the united arab emirates. *International Journal of Auditing*, 27(1), 24-44. <https://doi.org/10.1111/ijau.12299>

- Patiro, S. (2024). The impacts of organizational changes on negative emotion resulting on employee trust in the insurance office of pt. asuransi sinar mas indonesia. *Kontigensi Jurnal Ilmiah Manajemen*, 12(1), 54-61. <https://doi.org/10.56457/jimk.v12i1.521>
- Peng, J., Li, M., Zhen, W., & Lin, Y. (2020). Transformational leadership and employees' reactions to organizational change: evidence from a meta-analysis. *The Journal of Applied Behavioral Science*, 57(3), 369-397. <https://doi.org/10.1177/0021886320920366>
- Rahman, J. and Ziru, A. (2022). Clients' digitalization, audit firms' digital expertise, and audit quality: evidence from china. *International Journal of Accounting and Information Management*, 31(2), 221-246. <https://doi.org/10.1108/ijaim-08-2022-0170>
- Ramli, N. (2024). Integrating technology in government internal audit: catalysts and challenges. *Information Management and Business Review*, 16(1(I)), 124-136. [https://doi.org/10.22610/imbr.v16i1\(i\).3668](https://doi.org/10.22610/imbr.v16i1(i).3668)
- Rehman, N., Mahmood, A., Ibtasam, M., Murtaza, S., Iqbal, N., & Molnár, E. (2021). The psychology of resistance to change: the antidotal effect of organizational justice, support and leader-member exchange. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.678952>
- Rikharðsson, P., Þórisson, K., Bergthorsson, G., & Batt, C. (2022). Artificial intelligence and auditing in small- and medium-sized firms: expectations and applications. *Ai Magazine*, 43(3), 323-336. <https://doi.org/10.1002/aaai.12066>
- Rumasukun, M. (2024). Facing economic uncertainty: adaptive audit strategies. *Golden Ratio of Auditing Research*, 4(2), 66-77. <https://doi.org/10.52970/grar.v4i2.391>
- Samiolo, R. (2023). Auditor judgment in the fourth industrial revolution. *Contemporary Accounting Research*, 41(1), 498-528. <https://doi.org/10.1111/1911-3846.12901>
- Sanusi, Z., Noor, N., Johari, R., Shafie, N., Isa, Y., Sanusi, S., ... & Nassir, M. (2022). A review and evolution of digital audit on auditor performance. *Ipn Journal of Research and Practice in Public Sector Accounting and Management*, 12(01), 147-169. <https://doi.org/10.58458/ipnj.v12.01.07.0080>
- Schreuder, A. and Smuts, H. (2023). Perspective chapter: audit digitalization – key impacts on the audit profession.. <https://doi.org/10.5772/intechopen.109042>
- Seethamraju, R. and Hecimovic, A. (2022). Adoption of artificial intelligence in auditing: an exploratory study. *Australian Journal of Management*, 48(4), 780-800. <https://doi.org/10.1177/03128962221108440>
- Sethibe, T. and Naidoo, E. (2022). The adoption of robotics in the auditing profession. *Sa Journal of Information Management*, 24(1). <https://doi.org/10.4102/sajim.v24i1.1441>
- Shammar, E. (2024). Innovative strategies for ensuring privacy in machine learning environments.. <https://doi.org/10.36227/techrxiv.170630089.92633255/v1>
- Sharma, N., Sharma, G., & Joshi, M. (2022). Lessons from leveraging technology in auditing during covid-19: an emerging economy perspective. *Managerial Auditing Journal*, 37(7), 869-885. <https://doi.org/10.1108/maj-07-2021-3267>
- Syahputra, R. (2022). Analysis of the role of internal audit in enhancing company's internal control. *Golden Ratio of Auditing Research*, 2(1), 42-52. <https://doi.org/10.52970/grar.v2i1.371>
- Thottoli, M., Ahmed, E., & Thomas, K. (2022). Emerging technology and auditing practice: analysis for future directions. *European Journal of Management Studies*, 27(1), 99-119. <https://doi.org/10.1108/ejms-06-2021-0058>
- Thottoli, M. (2024). Leveraging information communication technology (ict) and artificial intelligence (ai) to enhance auditing practices. *Accounting Research Journal*, 37(2), 134-150. <https://doi.org/10.1108/arj-09-2023-0269>
- Voet, J. (2019). Distributive justice and resistance to change in cutback management: evidence from a survey experiment and a longitudinal field study. *International Public Management Journal*, 24(6), 997-1022. <https://doi.org/10.1080/10967494.2019.1676347>

- Vuković, B., Tica, T., & Jakšić, D. (2024). Challenges of using digital technologies in audit. *Anali Ekonomskog Fakulteta U Subotici*, (51), 15-30. <https://doi.org/10.5937/anebsub2300014v>
- Wassie, F. (2024). Artificial intelligence and the future of the internal audit function. *Humanities and Social Sciences Communications*, 11(1). <https://doi.org/10.1057/s41599-024-02905-w>
- Yi, X., Liu, Z., Gong, B., & Yan, W. (2023). Research on the development trend of block-chain audit theory——based on citespace v analysis.. <https://doi.org/10.4108/eai.18-11-2022.2326765>
- Yusoff, Y., Johari, A., Rahmatullah, D., Zainal, N., Tajuddin, N., & Thilaiampalam, N. (2023). Industry revolution 4.0: rapid growth of technology may affect job security in auditing profession: a concept paper. *International Journal of Academic Research in Business and Social Sciences*, 13(3). <https://doi.org/10.6007/ijarbss/v13-i3/16546>
- Zhong, H. (2024). From data to insights: the application and challenges of knowledge graphs in intelligent audit. *Journal of Cloud Computing Advances Systems and Applications*, 13(1). <https://doi.org/10.1186/s13677-024-00674-0>