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AI and Big Data in Islamic Financial Risk Management

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Abstract–The development of digital technology has driven significant transformations in risk management within the financial sector, including Islamic finance. The integration of Artificial Intelligence (AI) and Big Data enables financial institutions to conduct risk analysis more quickly, accurately, and data-driven, while also supporting compliance with Sharia principles. This research aims to systematically examine the application of AI and Big Data in Islamic financial risk management and identify the challenges and directions for its development. The method used is a Systematic Literature Review (SLR) of relevant scientific publications from the period 2020–2025. The study results indicate that the utilization of AI and Big Data can improve the accuracy of financing risk prediction, strengthen fraud detection, and enhance the efficiency of Sharia compliance monitoring thru automated transaction and contract analysis. However, the implementation of this technology still faces a number of challenges, particularly regarding ethical issues, data security and privacy, potential algorithmic bias, and limitations in the transparency of AI models. Therefore, this research proposes a conceptual framework that integrates Explainable AI (XAI) and data governance based on the principles of maqasid al-shariah. The contribution of this research lies in its effort to bridge digital technology innovation with Sharia values in order to support transparent, accountable, and sustainable Sharia financial risk management.

Keywords: Artificial Intelligence; Big Data; Risk Management; Islamic Finance; Explainable AI

1. INTRODUCTION

The development of digital technology in the last two decades has fundamentally changed the landscape of the global financial industry. Artificial Intelligence (AI) and Big Data are the main drivers of this transformation due to their ability to process large-scale data, detect risk patterns, and support rapid and accurate decision-making (Deloitte, 2022; Alam & Gupta, 2024). In the banking and financial services sector, this technology has proven to improve operational efficiency while also enhancing system resilience against increasingly complex financial risks (Hassan & Ali, 2023).

As the global Islamic financial industry grows, the need for adaptive and technology-based risk management systems becomes increasingly urgent. Islamic finance has unique characteristics because it not only faces conventional financial risks but also Shariah compliance risk related to the prohibition of usury, gharar, and maysir (IFSB, 2023; Sukmana et al., 2024). Therefore, the application of AI and Big Data in Islamic finance cannot be separated from the principles of justice, transparency, and social responsibility, which are the main foundations of the Islamic system (IsDB, 2021).

Various international studies show that AI, particularly thru machine learning and deep learning, is capable of improving the accuracy of financing risk predictions and reducing the rate of Non-Performing Financing (NPF) at Islamic banks (Hassan & Ali, 2023; Kusnadi et al., 2023). On the other hand, Big Data Analytics enables Islamic financial institutions to monitor operational risk, market risk, and liquidity risk in real-time by integrating internal and external data (Rahim & Noor, 2022; Koswara, 2024).

Beside improving technical efficiency, AI and Big Data also play a crucial role in strengthening Sharia compliance oversight. Technology such as Natural Language Processing (NLP) has been used to analyze academic documents and transactions to automatically detect potential Sharia violations (Ahmed & Rustam, 2021; Shalhoob & Babiker, 2025). This approach is considered capable of accelerating the Sharia audit process and reducing the risk of human error, which often arises in manual oversight systems (Nawaz, 2025).

However, the literature also highlights various serious challenges in the implementation of AI and Big Data in Islamic finance. Issues of technology ethics, data security and privacy, and the potential for algorithmic bias are of major concern because they can lead to unfair and unaccountable decisions (Qasim & Fauzi, 2023; Khan, 2025). This challenge becomes increasingly complex considering that Sharia principles demand clarity (transparency) and accountability in every financial decision (Alam & Gupta, 2024).

The limited transparency of AI models (the black box problem) is also an obstacle to the implementation of digital technology in Islamic financial institutions. Shariah Supervisory Boards and regulators need systems that can clearly explain and audit the basis of algorithmic decision-making (Zafar & Ali, 2025; Jokhio & Jaffer, 2025). In this context, the concept of Explainable AI (XAI) began to be introduced as a solution to bridge the needs of modern technology with the demands of Sharia accountability (Nawaz, 2025).

On the regulatory and institutional side, there are still policy gaps regarding the utilization of AI and Big Data in Islamic finance, especially in developing countries. Many jurisdictions do not yet have ethical and governance standards for technology that specifically regulate the use of AI within the framework of maqasid al-shariah (Khan, 2025; Zafar &

Ali, 2025). Additionally, the limited human resources who understand both technology and Sharia principles pose a significant structural challenge (Syedna et al., 2024).

Based on these conditions, this research is important to comprehensively examine how the integration of AI and Big Data can strengthen Islamic financial risk management without neglecting Islamic values. Unlike previous research that tended to focus on technical aspects, this study emphasizes an integrative approach that combines digital technology, risk governance, and the principles of maqasid al-shariah thru an Explainable AI framework. Thus, this research is expected to provide theoretical and practical contributions to academics, regulators, and Islamic financial institutions in building a modern, ethical, and sustainable risk management system.

3. RESEARCH METHODS

Research Methodology This study employs a qualitative-descriptive approach with the Systematic Literature Review (SLR) method to comprehensively examine the development of Artificial Intelligence (AI) and Big Data applications in Islamic financial risk management. The SLR method was chosen because it can present a systematic, transparent, and replicable scientific synthesis in identifying research trends, key findings, and research gaps (Tranfield et al., 2003; Kitchenham & Charters, 2007). The SLR process follows the PRISMA guidelines, which include the stages of identification, screening, eligibility assessment, and analysis of relevant scientific articles (Moher et al., 2009). Data sources were obtained from reputable national and international journals indexed by Scopus, Web of Science, and SINTA, as well as official reports from international institutions such as the Islamic Financial Services Board (IFSB) and the Islamic Development Bank (IsDB).

The analyzed articles are limited to publications from the period 2020–2025, focusing on the application of AI, Big Data, and Islamic financial risk management. Inclusion criteria include articles discussing financing risk, operational risk, market risk, and Sharia compliance, while articles irrelevant to the Sharia context are excluded from the analysis. Data were analyzed using thematic content analysis to group findings into key themes such as risk prediction, Sharia compliance audits, Explainable AI (XAI), and technology governance (Braun & Clarke, 2006; Alam & Gupta, 2024). This approach allows research to construct an integrative conceptual framework that systematically and academically connects technological innovation with the principles of maqasid al-shariah.

Literature Review Risk management in Islamic finance aims to identify, assess, and control risks while maintaining compliance with Islamic principles. The Basel II framework, as adapted by the Islamic Financial Services Board (IFSB, 2023), emphasizes the importance of incorporating operational, financing, market, and Shariah risks into an integrated supervisory system. In the digital context, the Technology Acceptance Model (TAM) theory and the Technology–Organization–Environment (TOE) framework explain factors influencing technology acceptance, such as usefulness, ease of use, organizational support, and the regulatory environment. AI enables large-scale financial data analysis using machine learning and deep learning algorithms. Meanwhile, Big Data supports risk analysis based on four key characteristics (volume, velocity, variety, and veracity). Some recent studies show positive developments: Cao et al. (2024) introduced RiskLabs, a Large Language Model (LLM) capable of predicting financial risk with high accuracy. Amin & Rahman (2023) found that Big Data Analytics increased the efficiency of Sharia compliance audits by up to 30%. Kusnadi et al. (2023) proved that the application of machine learning in Indonesian Sharia banks can reduce Non-Performing Financing (NPF) by up to 10%.However, the literature also notes limitations: the lack of AI models that explicitly consider halal-haram principles and the absence of AI ethical standards in Islamic finance.

The development of digital technology has prompted Islamic financial institutions to adopt more advanced analytical approaches in risk management. One widely researched approach is the use of AI in modeling financing risk based on customer behavior. A study conducted by Hassan & Ali (2023) shows that machine learning algorithms can improve the accuracy of predicting non-performing loans by more than 20% compared to traditional scoring methods. This finding indicates that AI is capable of providing a more comprehensive risk assessment by leveraging historical data and transaction patterns in real-time (Hassan & Ali, 2023).

Beside AI, the utilization of Big Data is also a key focus in strengthening the management of Islamic financial risk. Research by Rahim and Noor (2022) found that Big Data analysis in Islamic banking can accelerate the process of monitoring liquidity and operational risks thru the integration of internal and external data. The study confirms that Big Data is not only a tool for monitoring risks, but can also provide strategic insights for management in formulating financing policies that are in accordance with Sharia principles (Rahim & Noor, 2022).

On the regulatory side, international organizations are also starting to promote the application of digital technology in risk governance. An Islamic Development Bank (IsDB) report confirms that integrating AI and Big Data can strengthen the Shariah Governance Framework by providing automated audit mechanisms for financial transactions and contracts. According to the IsDB (2021), the implementation of this technology not only improves the accuracy of Sharia audits but also accelerates the process of identifying potential Sharia violations in financing systems. This is important considering that Sharia compliance is a key element that distinguishes Islamic financial institutions from conventional ones (IsDB, 2021).

However, the literature also highlights a number of new risks arising from the use of this technology. Research by Qasim and Fauzi (2023) emphasizes that the lack of transparency in AI algorithms can pose risks, such as financing decisions that are difficult to explain to regulators and the Sharia Supervisory Board. Additionally, data security issues

are a critical concern due to the increasing use of large-scale customer data. The study recommends the need for ethical technology standards aligned with the objectives of Islamic law to ensure digital innovation remains within the framework of Sharia (Qasim & Fauzi, 2023).

In addition to these various positive findings, the integration of AI and Big Data also drives improvements in risk management quality thru a more adaptive predictive approach. Traditional risk models tend to be static and rely on assumptions that often fail to capture the dynamics of modern markets. However, with AI and Big Data technology, Islamic financial institutions can implement dynamic, continuously learning risk models that can adjust predictions in real-time based on changes in economic conditions and customer behavior. This approach allows financial institutions to detect early signs of financing risk, market risk, or operational risk more quickly than manual methods.

Furthermore, this technology helps improve decision-making integrity by reducing the potential for human error and strengthening the objectivity of analysis. This is very important considering that Islamic financial institutions have a moral and legal responsibility to ensure that every financing decision complies with the principles of justice and does not cause harm to any party. For example, thru Big Data analysis, financial institutions can assess the viability of the halal business sector, map industry risks, and more accurately identify Islamic economic trends.

However, strengthening digital risk management still requires mature policy support and governance standards. Without clear guidelines, the use of AI actually has the potential to create new uncertainties, particularly regarding data protection and decision transparency. Therefore, the development of AI ethical standards based on the maqasid al-shariah is becoming increasingly urgent to ensure that technological innovation truly supports the goals of Sharia in maintaining the sustainability and justice of the Sharia financial system.

3. RESULT AND DISCUSSION

3.1 Results

The bibliometric analysis in this study was conducted using VOSviewer software to map the development and patterns of research related to the integration of Artificial Intelligence (AI) and Big Data in Islamic financial risk management. Bibliometric data were obtained from scientific articles published between 2020 and 2025 that are indexed in internationally and nationally reputable databases. The analysis focuses on keywords, the interconnections between concepts, and the intensity of research topics evolving in the literature.

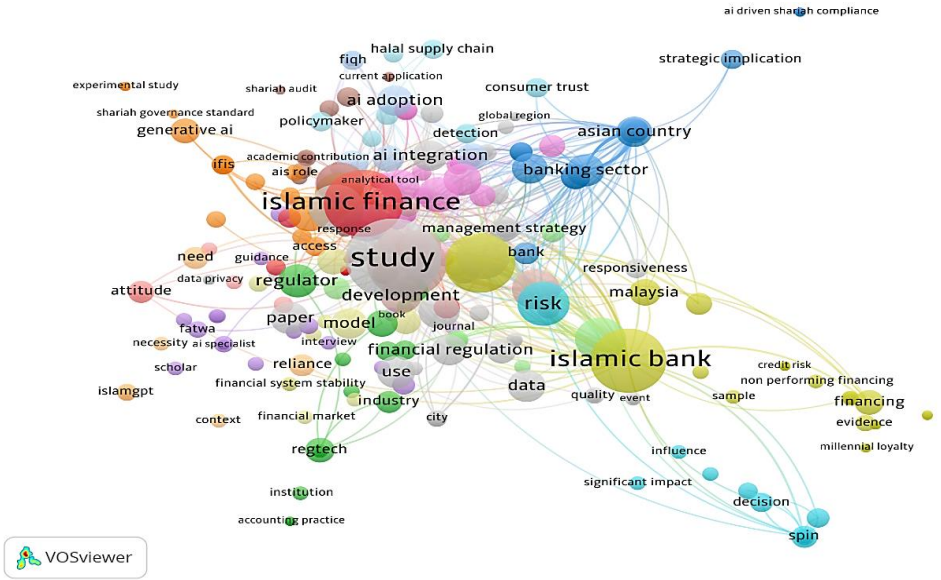

Figure 1. Network Visualization

The network visualization results show the formation of several interconnected main clusters. The first cluster is dominated by the keywords Artificial Intelligence, machine learning, risk management, and Islamic banking, representing the research focus on utilizing AI for financing risk prediction and reducing Non-Performing Financing (NPF). The second cluster centers on Big Data, data analytics, fraud detection, and operational risk, illustrating the role of Big Data in strengthening operational risk monitoring and detecting transaction anomalies. Meanwhile, the third cluster highlights the keywords Shariah compliance, Shariah governance, and Islamic finance, indicating the literature's focus on Shariah compliance aspects in the application of digital technology.

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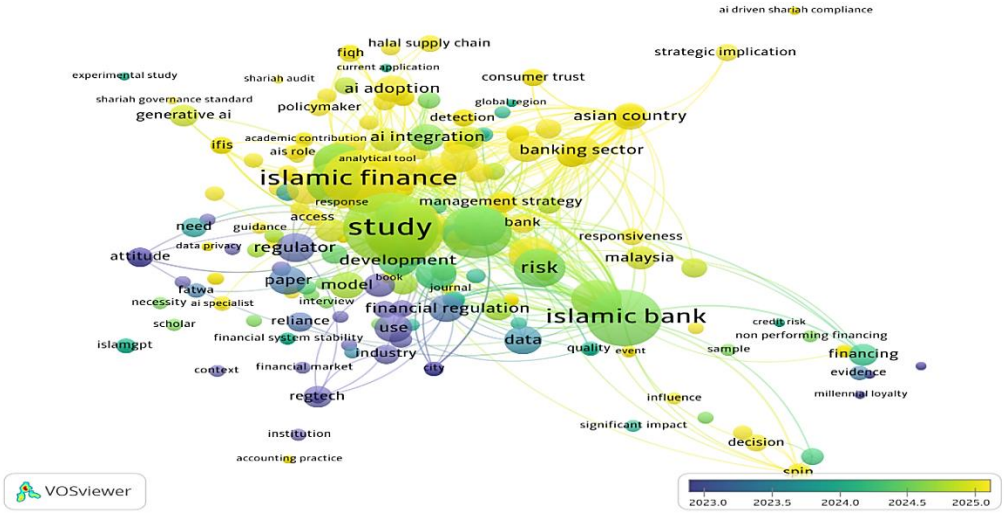

Figure 2. Overlay Visualization

The overlay visualization results show a shift in research focus from basic issues like the digitalization of Islamic banking toward more advanced topics. Keywords such as Explainable AI, Shariah audit automation, and ethical AI appear in brighter colors, indicating that these topics are the latest research trends. This finding indicates growing academic attention to algorithmic transparency and AI decision-making accountability in the context of Islamic finance.

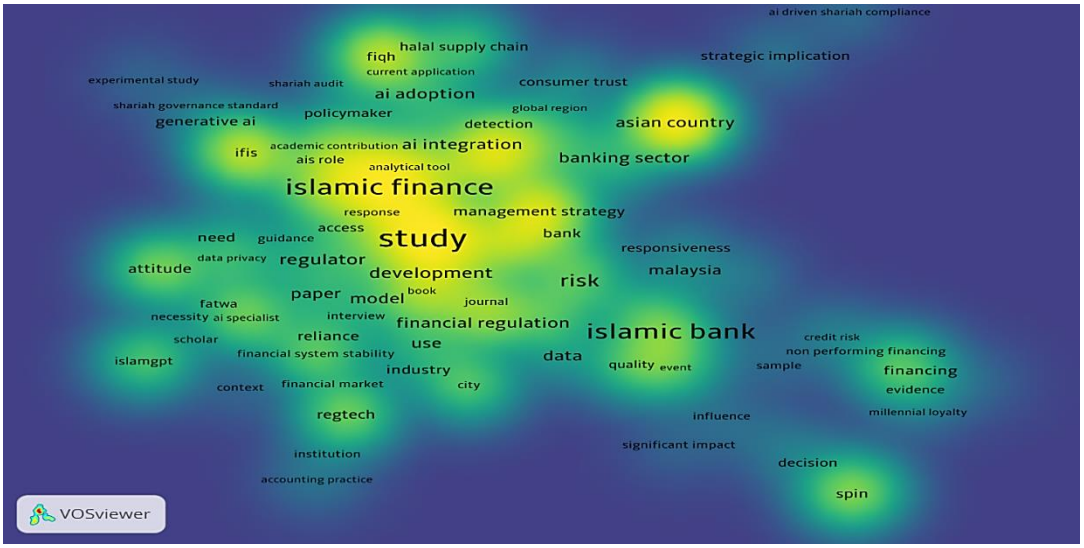

Figure 3. Density Visualization

Next, the density visualization shows that the areas with the highest research density are in the combination of AI, risk management, and Islamic banking topics. Lower but growing density is seen in the topics of Explainable AI and Shariah-based data governance, indicating that these areas are still relatively new and have significant potential for further research development. Thus, the results of the VOSviewer analysis confirm that although research on AI and Big Data in Islamic finance has grown rapidly, studies that comprehensively integrate technological, ethical, and maqasid al-shariah aspects are still limited.

Overall, this bibliometric analysis indicates a significant increase in research on AI and Big Data in Islamic financial risk management over the past five years, with the direction of development increasingly leaning toward transparency, Shariah governance, and the application of Explainable AI. These findings strengthen the position of this research as an effort to fill the research gap by offering an integrative approach based on Shariah-Compliant Explainable AI.

3.2 Discussion

The results of the bibliometric analysis using VOSviewer show that the integration of Artificial Intelligence (AI) and Big Data in Islamic financial risk management is a rapidly developing research area in the last five years. This finding aligns with the increasing adoption of digital technology in the global financial industry, which demands more adaptive and predictive risk management systems (Deloitte, 2022; Alam & Gupta, 2024). In the context of Islamic finance, this development marks a shift from traditional risk management approaches toward data-driven and intelligent algorithm-based approaches (Hassan & Ali, 2023).

The dominance of the AI and risk management clusters in the network visualization indicates that the main research focus is still on improving the accuracy of financing risk prediction and reducing Non-Performing Financing (NPF). Several empirical studies have proven that the application of machine learning in Islamic banks can significantly improve the quality of risk assessment compared to conventional methods (Kusnadi et al., 2023; Noer Rahmi et al., 2024). This indicates that AI plays a strategic role in supporting the financial stability of Islamic institutions, especially amidst global economic uncertainty (Hassan & Ali, 2023).

Beside AI, the role of Big Data in risk management is also prominent thru clusters related to data analytics, operational risk, and fraud detection. Big Data enables Islamic financial institutions to integrate various internal and external data sources for real-time risk monitoring (Rahim & Noor, 2022; Sukmana et al., 2024). This finding reinforces the view that Big Data not only improves operational efficiency but also provides a more comprehensive and evidence-based foundation for strategic decision-making (Koswara, 2024).

The cluster related to Shariah compliance and Shariah governance emphasizes that Shariah compliance remains a central issue in the development of Shariah-compliant financial technology. The use of technology such as Natural Language Processing (NLP) for contract and transaction analysis has been proven to help detect potential Sharia violations more quickly and consistently (Ahmed & Rustam, 2021; Shalhoob & Babiker, 2025). This supports the findings of the IsDB (2021), which stated that digitalization can strengthen the sharia governance system if applied correctly.

Nevertheless, the results of the overlay visualization reveal the emergence of new issues that are gaining increasing attention, particularly those related to technology ethics, algorithmic transparency, and the accountability of AI decisions. The literature emphasizes that using AI without adequate explanation has the potential to create black box problems, which are difficult to accept in the Islamic financial system that demands clarity and fairness (Qasim & Fauzi, 2023; Khan, 2025). This condition confirms that technological progress must be balanced with the strengthening of ethical and governance aspects.

The emergence of the keyword Explainable AI (XAI) as a recent research topic reflects the need for AI models that can be explained and audited by regulators and the Shariah Supervisory Board. Some studies confirm that XAI has the potential to be a solution for bridging algorithmic complexity with the demands of Sharia transparency (Nawaz, 2025; Jokhio & Jaffer, 2025). With XAI, AI-based decisions are not only accurate but also legally and ethically accountable (Zafar & Ali, 2025).

From an institutional perspective, the analysis results indicate that the adoption of AI and Big Data in Islamic finance still faces structural challenges, such as limited digital infrastructure and competent human resources. The studies by Syedna et al. (2024) and Pambuko et al. (2025) emphasize that the success of digital transformation is highly influenced by organizational readiness and regulatory support. Without a clear policy framework, the implementation of technology can actually increase new risks, particularly those related to data security and consumer protection (Khan, 2025).

Overall, this discussion confirms that the integration of AI and Big Data in Islamic financial risk management provides significant benefits, but must be managed carefully and based on the principles of maqasid al-shariah. The bibliometric results indicate a research gap in developing an integrative framework that combines technology, ethics, and Sharia governance. Therefore, this research reinforces the urgency of developing Shariah-Compliant Explainable AI as a future direction to ensure that digital innovation not only improves efficiency but also maintains the fairness, transparency, and sustainability of the Islamic financial system (Alam & Gupta, 2024; Nawaz, 2025).

4. CONCLUSION

This research concludes that the integration of Artificial Intelligence (AI) and Big Data significantly contributes to strengthening the management of Islamic financial risk, from technical, operational, and Sharia compliance perspectives. Based on the results of the literature review and bibliometric analysis using VOSviewer, it was found that the utilization of AI technology—through machine learning, Natural Language Processing (NLP), and predictive models—is able to improve the accuracy of financing risk prediction, reduce the Non-Performing Financing (NPF) rate, and accelerate the detection of fraud and transaction anomalies. Meanwhile, Big Data plays a crucial role in providing a comprehensive and real-time database to support more effective monitoring of operational, market, and liquidity risks. However, this research also confirms that the application of AI and Big Data in Islamic finance still faces serious challenges, particularly regarding issues of technological ethics, data security and privacy, potential algorithmic bias, and the limited transparency of AI models, which contradicts the principles of Islamic justice and accountability. Therefore, this research emphasizes the importance of developing a technology governance framework aligned with the maqasid al-shariah, including the implementation of Explainable AI (XAI) to ensure that every algorithmic decision can be explained, audited, and accountable to regulators and the Shariah Supervisory Board. Overall, the findings of this research contribute theoretically and practically by offering an integrative approach that bridges digital technology innovation and Sharia values, ensuring that AI and Big Data serve not only as efficiency tools but also as key pillars in building a transparent, ethical, and sustainable Sharia financial system.

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REFERENCES

Ahmed, S., & Rustam, F. (2021). Artificial intelligence and Shariah compliance in Islamic finance: Opportunities and challenges. *Journal of Islamic Finance*, 10(2), 45–60.

Alam, N., & Gupta, L. (2024). Artificial intelligence in Islamic finance: A systematic literature review on risk management and Shariah compliance. *Journal of Islamic Marketing*, 15(3), 678–699. https://doi.org/10.1108/JIMA-02-2023-0056

Amin, M., & Rahman, A. A. (2023). Big data analytics and Shariah audit efficiency in Islamic financial institutions. *International Journal of Islamic Accounting and Business Research*, 14(4), 512–528.

Astuty, W., Habibie, A., Pasaribu, F., Pratama, I., & Rahayu, S. (2022). Pemanfaatan informasi akuntansi dan partisipasi anggaran sebagai anteseden kinerja manajerial: mengeksplorasi peran moderasi komitmen organisasi, gaya kepemimpinan, ketidakpastian lingkungan, dan strategi bisnis di Indonesia.

Astuty, W., Pasaribu, F., Rahayu, S., & Habibie, A. (2021). Pengaruh ketidakpastian lingkungan, struktur organisasi dan kompetensi jaringan distribusi terhadap kualitas sistem informasi manajemen rantai pasokan. *Manajemen Rantai Pasokan yang Tidak Pasti* , *9* (1), 116-124.

Astuty, W., Rahayu, S., & Lubis, N. (2015). Langkah Muda Menyusun Laporan Keuangan dengan MYOB Accounting Versi 19 untuk Perusahaan Jasa dan Dagang. *Kumpulan Jurnal Dosen Universitas Muhammadiyah Sumatera Utara* , *1* (01).

Astuty, W., Zufrizal, Z., Pasaribu, F., & Rahayu, S. (2021). Pengaruh manajemen hubungan pelanggan, kompetensi sumber daya manusia dan sistem pengendalian internal terhadap efektivitas manajemen rantai pasokan di sektor publik Indonesia. *Manajemen Rantai Pasokan yang Tidak Pasti* , *9* (3), 595-602.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Cao, Y., Zhang, H., & Liu, X. (2024). RiskLabs: Large language models for financial risk prediction. *Journal of Financial Data Science*, 6(1), 23–41.

Chalik, I., & Rahayu, S. (2018). Faktor–Faktor Yang Mempengaruhi Minat Berwirausaha (Studi Kasus Mahasiswa Prodi Akuntansi UISU). Dalam *Seminar Nasional Sains dan Teknologi Informasi (SENSASI)* (Vol. 1, No. 1).

Deloitte. (2022). *AI and analytics in financial risk management*. Deloitte Insights.

Hasibuan, DS, Sembiring, IY, Sidabalok, SPT, Pane, SG, & Rahayu, S. Pengaruh Lingkungan Kerja, Kecerdasan Emosional, dan Karakteristik Pekerjaan terhadap Kinerja Karyawan Kantor Kelurahan Simpang Empat, Kabupaten Asahan.

Hassan, M. K., & Ali, S. (2023). Machine learning for predicting non-performing financing in Islamic banks: A behavioral analytics approach. *Pacific-Basin Finance Journal*, 78, 101945. https://doi.org/10.1016/j.pacfin.2023.101945

Islamic Development Bank. (2021). *Shariah governance and digital transformation in Islamic finance*. IsDB Group.

Islamic Financial Services Board. (2023). *Revised guiding principles on risk management for institutions offering Islamic financial services*. IFSB.

Jamil, A., & Farzana, K. (2025). AI-driven Shariah compliance: Strategic implications for Islamic fintechs in emerging economies. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5373161

Jokhio, M. N., & Jaffer, M. A. (2025). Generative AI in Shariah advisory in Islamic finance. *Journal of Islamic Business and Management*, 19(2), 101–118. https://doi.org/10.54784/1990-6587.1665

Khan, T. (2025). AI governance for Islamic finance: A dynamic prescriptive approach. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5143165

Kitchenham, B., & Charters, S. (2007). *Guidelines for performing systematic literature reviews in software engineering*. EBSE Technical Report.

Koswara, A. (2024). Predicting trends in Islamic banking and finance: A big data analysis using Google Trends and AI. *Journal of Sustainable Economics and Business Administration*, 2(2), 150–165. https://doi.org/10.52620/jseba.v2i2.199

Kurnianingsih, HT, & Rahayu, S. (2020). Kinerja Keuangan Dinilai Dari Kasus Nilai Ekonomi Edded (EVA) dan Nilai Pasar Tambah (MVA) di Sub-Sektor Kosmetik dan Kebutuhan Rumah Tangga yang Terdaftar di BEI. *Budapest International Research and Critics Institute* , *3* (4), 3179-3184.

Kurniawan, H., Gunawan, R., & Rahayu, S. (2025, Juli). Ekonomi Hijau dalam Perspektif Ekonomi Syariah: Solusi untuk Pembangunan Berkelanjutan. Dalam *Prosiding Seminar Nasional Teknologi Komputer dan Sains* (Vol. 3, No. 1, pp. 361-368).

Kusnadi, Y., Rahman, M. A., & Hidayat, R. (2023). Machine learning applications in Islamic banking risk management: Evidence from Indonesia. *Asian Journal of Accounting Research*, 8(3), 289–305.

Lubis, H., Ismail, S., Rahayu, S., & Kurnianingsih, HT (2025). Model Kewirausahaan Perempuan di Koperasi Medan Tuntungan, Ladang Bambu, Sumatera Utara: Pengabdian. *Jurnal Pengabdian Masyarakat dan Riset Pendidikan* , *3* (4), 2520-2527.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), e1000097.

Muhammad, R., Suluki, A., & Nugraheni, P. (2020). Internal factors and non-performing financing in Indonesian Islamic rural banks. *Cogent Business & Management*, 7(1), 1823583. https://doi.org/10.1080/23311975.2020.1823583

Nawaz, H. (2025). Artificial intelligence in Sharīʿah audit and compliance. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5254376

Noer Rahmi, A., Pratiwi, S. S., Yayuningsih, S., Palupi, A., & Salsabila, L. (2024). Determinants of non-performing financing in Islamic banks: Evidence from Southeast Asia. *Jurnal Ekonomi Syariah Teori dan Terapan*, 11(2), 135–147. https://doi.org/10.20473/vol11iss20242pp135-147

Pambuko, Z. B., Sriyana, J., Affandi, A., & Hakim, A. (2025). Influence of spin-off decision on financing risk: Empirical insight from Indonesian Islamic banks. *F1000Research*, 14, 157435. https://doi.org/10.12688/f1000research.157435.3

Pertiwi, ID, Yani, M., & Rahayu, S. (2025, Juli). Green Sukuk dan Pembiayaan Berkelanjutan: Analisis Empiris terhadap Efektivitas Instrumen Keuangan Islam dalam Mendukung Transisi Energi Bersih. Dalam *Prosiding Seminar Nasional Teknologi Komputer dan Sains* (Vol. 3, No. 1, pp. 81-88).

Putri, AAK, Zufrizal, Z., Habibie, A., & Hakim, I. (2024). Dampak Boikot Terhadap Stabilitas Keuangan Perusahaan Cepat Saji Yang Terdaftar Di Indeks Saham Syariah Indonesia (Issi): Analisis Prediksi Kebangkrutan Menggunakan Model Springate. *Krigan: Jurnal Manajemen dan Bisnis Syariah* , *2* (2), 129-139.

Qasim, A., & Fauzi, H. (2023). Ethical challenges of artificial intelligence in Islamic finance. *Journal of Islamic Accounting and Business Research*, 14(2), 220–236.

Rahayu, S. (2019). Kualitas Infromasi Akuntansi Dan Tingkat Penerimaan Dana Zakat Pada Lembaga Amil Zakat Di Kota Medan. *Jurnal Investasi Islam*, *4*(2), 116-126.

Rahayu, S. (2019). Profitabilitas Dan Pengaruhnya Terhadap Pengungkapan Islamic Social Reporting Pada Perusahaan Yang Terdaftar Di Jakarta Islamic Index. *Jurnal Mutiara Akuntansi* , *4* (1), 37-48.

Rahayu, S., & Riana, Z. (2020). Faktor-faktor Penentu Kecurangan Perspektif Teori Pentagon dan Pengaruhnya terhadap Laporan Keuangan Curang pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)* , *3* (3), 1995-2010.

Rahayu, S., & Riana, Z. (2020). Faktor-faktor Penentu Kecurangan Perspektif Teori Pentagon dan Pengaruhnya terhadap Laporan Keuangan Curang pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)* , *3* (3), 1995-2010.

Rahayu, S., Jaafar, MA, & Azni, AI (2025). Peningkatan Pendapatan Ibu Rumah Tangga Melalui Pelatihan Kuliner Khas Masakan Ayam Geprek Indonesia di Kampung Warna-Warni Kuala Perlis. *Buletin Pengabdian Masyarakat ADA* , *1* (1), 33-38.

Rahayu, S., Ningsih, HTK, & Zukhairani, I. (2018). Pengaruh Rasio Pinjaman terhadap Simpanan (LDR), Rasio Kecukupan Modal (CAR) dan Pengembalian Aset (ROA) terhadap Harga Saham di Bank Komersial Syariah di Indonesia. Dalam *Prosiding Konferensi Internasional ke-7 tentang Penelitian Multidisiplin* (hlm. 681-685).

Rahayu, S., Siregar, S., Suginam, AH, & Habibie, A. (2019). Pengaruh Penerapan Prinsip Tata Kelola Pemerintahan yang Baik Terhadap Penerimaan Dana Zakat di Lembaga Amil Zakat di Kota Medan. Dalam *Prosiding Seminar Internasional Studi Islam* (Vol. 1, No. 1, hlm. 746-754).

Rahayu, S., Tullah, DS, Suginam, S., & Nur, S. (2025). Digitalisasi, AI, dan Kualitas Layanan di Bank Umum Syariah: Kepuasan dan Pengetahuan Nasabah sebagai Mediator Paralel terhadap Kinerja Keuangan yang Dirasakan Nasabah. *Jurnal Ilmiah Akuntansi Kesatuan* , *13* (3), 611-616.

Rahim, A. R., & Noor, Z. M. (2022). Big data analytics and risk monitoring in Islamic banking. *International Journal of Islamic Finance*, 14(1), 67–84.

Saprudin, A., Sudrajat, S., & Saepudin, U. (2024). Analysis of determinants of credit risk and non-performing financing in Islamic banks. In *Proceedings of the 7th International Conference of Economics, Business, and Entrepreneurship (ICEBE 2024)*. https://doi.org/10.4108/eai.4-9-2024.2353782

Shalhoob, H., & Babiker, I. (2025). Exploration of AI in ensuring Sharia compliance in Islamic financial institutions. *Open Journal of Business and Management*, 13(2), 1435–1448. https://doi.org/10.4236/ojbm.2025.132075

Sinambela, E., Rahayu, S., & Saragih, F. (2015). Pengantar Akuntansi. *Medan: Perdana Publishing*.

Siregar, D., Rahayu, S., Saputra, I., Sari, DP, & Sari, VW (2025). Peningkatan Daya Saing UMKM Kerajinan Lokal Melalui Penerapan Konsep Bluepreneur Berbasis Sumber Daya Ramah Lingkungan. *Buletin Pengabdian Masyarakat ADA* , *1* (1), 18-24.

Sri, R., Mahdi, F., Julkarnain, J., Kurnia, H. N. T., & Habibie, A. (2022). Intellectual capital and islamic corporate social responsibility on the financial performance of sharia commercial banks in Indonesia. In *E3S Web of Conferences* (Vol. 339, p. 05003). EDP Sciences.

Suginam, S., Pamungkas, B., Rahayu, S., & Hashim, N. (2025). Mengintegrasikan Nilai-Nilai Islami dan Strategi Keuangan Peran Pengelolaan Keuangan Berbasis Syariah Dalam Meningkatkan Kinerja UMKM Muslim. *Jurnal Ilmiah Akuntansi Kesatuan* , *13* (3), 451-466.

Suginam, S., Rahayu, S., & Purba, E. (2021). Efektivitas Penyaluran KUR (Kredit Usaha Rakyat) Untuk Pengembangan UMKM. *Ekonomi, Keuangan, Investasi Dan Syariah (EKUITAS)*, *3*(1), 21-28.

Suginam, S., Rahayu, S., & Purba, E. (2021). Efektivitas Penyaluran KUR (Kredit Usaha Rakyat) Untuk Pengembangan UMKM. *Ekonomi, Keuangan, Investasi Dan Syariah (EKUITAS)*, *3*(1), 21-28.

Sukmana, R., et al. (2024). Big data-driven Shariah compliance analytics: Evidence from Southeast Asian Islamic banks. *Borsa Istanbul Review*, 24(4), 890–907. https://doi.org/10.1016/j.bir.2024.03.005

Syedna, A., Yumna, A., & Jallow, M. S. (2024). Unleashing the power of artificial intelligence in Islamic banking: A case study of Bank Syariah Indonesia. *Modern Finance*, 2(1), 1–16. https://doi.org/10.61351/mf.v2i1.116

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222.

Zafar, M. B., & Ali, H. (2025). Shariah governance standard on generative AI for Islamic financial institutions. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5143165