

AI IN FATWA FORMULATION: TRANSFORMING SHARIA-COMPLIANT FINANCE

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Abstract

Fatwas play a pivotal role in Islamic jurisprudence, serving as legal instruments to ensure that financial practices align with Shariah principles. For Islamic financial institutions, timely and accurate fatwas are essential to maintain compliance, operational clarity, and stakeholder trust. However, the fatwa development process is often time intensive. This study explores how artificial intelligence (AI) can be integrated into fatwa formulation to enhance efficiency and responsiveness. Using the Analytic Network Process (ANP), Shariah advisors and members of the Shariah Supervisory Board of Islamic Financial Institutions evaluated the benefits, costs, opportunities, and risks of AI adoption. AI's capacity for comprehensive data analysis is found to be the most weighted benefit. Key concerns include the cost of scientific verification, the risk of automating sacred decision-making, and the weakening of *istinbath* (legal reasoning) by scholars. To harness AI's potential while preserving the integrity of Islamic jurisprudence, appropriate tools, training, and governance frameworks are essential. AI has the potential not only to streamline fatwa issuance but also to transform the responsiveness and scalability of Shariah-compliant financial services. This study contributes to the literature on AI and Islamic jurisprudence by offering an evidence-based framework for responsible AI integration in Shariah governance.

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I. INTRODUCTION

Fatwa has a significant role to ensure the Sharia compliance of the Islamic financial institutions both operating under normal basis operation and financial technology.¹ To issue a fatwa, it takes Muslim scholars with certain criteria including comprehensive understanding of Islamic law and Arabics. Fatwa sets regulatory frameworks and maintain ethical foundations of Islamic finance.² Upon compatibility of fatwa, operations and products are validated and thus the trusts of Muslim consumer are reinforced.³

Fatwa does not only set operational rules but also preserves Islamic financial ethics.⁴ By this, the uniqueness of Islamic finance should be distinctive because this industry should have different set of regulations, stakeholder behavior, and market performance. Additionally, Sharia opinions also contribute to Islamic financial literacy, educating both practitioners and consumers about Sharia-compliant practices and ethical obligations.⁵ Fatwa also support risk mitigation in financial

¹ Ahmet KILINÇ, "OsmanlıDevletiNinİslam HukukunTesiri," *Yıldırım Beyazıt Hukuk Dergisi* 7, no. 2 (2022): 547–80, <https://doi.org/10.33432/ybuhukuk.1090220>.

² Auwal Salisu, Shereeza Mohamad Saniff, and Shahir Akram Hassan, "Sharia Board of Islamic Banks and the Attitude of Fatwa Shopping," *Ekonomika: Jurnal Ekonomi Dan Bisnis Islam* 5, no. 2 (2020): 193–204, <https://doi.org/10.24042/febi.v5i2.7665>.

³ Sofian Al Hakim, "Analytical Framework in Study of Fatwas on Sharia Economics," *Abkam: Jurnal Ilmu Syariah* 19, no. 2 (2019): 315–30, <https://doi.org/10.15408/ajis.v19i2.12219>.

⁴ KILINÇ, "OsmanlıDevletiNinİslam HukukunTesiri."

⁵ Fadly Yashari Soumena, "A Critical Review of the Indonesian Council of Ulama (MUI) Fatwa Towards Increasing Sharia Financial Literacy (Systematic Literature Review)," *Journal of Economics Research and Social Sciences* 8, no. 1 (2024): 133–51, <https://doi.org/10.18196/jerss.v8i1.21498>.

transactions by clarifying permissible contracts, dispute resolution mechanisms, and investment strategies, thereby strengthening financial stability and investor confidence.⁶

As Islamic finance grows and the financial transactions themselves face new advancement and complexities, discussions on how to expedite the process are increasing. Fatwa development process may take significant time. One emerging approach is the integration of artificial intelligence (AI), which offers modern solutions and new possibilities for improving efficiency.

AI has a wide potential in the process of *ijtihad*, because it can meet the requirements needed for a *mujtahid*. However, AI needs to be designed to meet the requirements needed in an *ijtihad*.⁷ Furthermore, in its development, Islamic scholars and AI engineers are important to collaborate in designing an AI system that is in accordance with Islamic principles that can be used in the formulation of fatwas.⁸

Among other functions, AI enables faster process of data collection, data categorization, and data analysis. For fatwa issuance, the process could be enhanced, and decision-making process could be expedited. AI also enable real time data analysis which can improve the whole process of fatwa development. AI can enhance the speed, accuracy, and accessibility of fatwa formulation and Islamic law discovery.⁹

The more comprehensive integration of AI, not only in terms of operational but also in terms of fundamental aspect such as fatwa development may sharpen the landscape of Sharia-compliant finance. Technological advancement through AI may improve and automate the compliance mechanisms, risk assessment models, and intelligent financial advisory services.¹⁰ AI enhances financial operations, mitigates Sharia compliance risks, and enables automated contract validation in Islamic banking and capital markets.¹¹ The adoption of AI-powered platforms further

⁶ Mohammad Hasan Bisri, "Fatwa as a Tool of Social Engineering: The Study of Fatwa of Tarjih Muhammadiyah," *Jurnal Penelitian* 17, no. 2 (2020): 131–44, <https://doi.org/10.28918/jupe.v17i2.2986>.

⁷ *Ijtihad* comes from an Arabic word which literally means "try hard and do whatever you can to accomplish a task or gain something". In general, there are two definitions of *Ijtihad*, the first "Ijtihad in the general sense", is the utilization of all efforts and endeavors to derive laws from Islamic sources such as the Qur'an and hadith. This type of *Ijtihad* is claimed to be unanimously accepted by all Muslim scholars from various schools of Islam. Second, "Ijtihad in the special sense", involves the use and acceptance of "legitimate conjectures" as evidence of religious law in cases where there is no explicit textual evidence. Hasan Latifi, "Challenges of Using Artificial Intelligence in the Process of Shi'i Ijtihad," *Religions* 15, no. 5 (2024), <https://doi.org/10.3390/rel15050541>.

⁸ B Ahmed, "The Status of the Use of Artificial Intelligence in Ijtihad," *Karachi Islamicus* 1, no. 1 (2021): 1–14, <http://www.karachiislamicus.com/index.php/ki/article/view/5>.

⁹ Amr Abdullah Munshi et al., "Automated Islamic Jurisprudential Legal Opinions Generation Using Artificial Intelligence," *Pertanika Journal of Science and Technology* 30, no. 2 (2022): 1135–56, <https://doi.org/10.47836/pjst.30.2.16>; Siti Farahiyah Ab Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations," *Journal of Fatwa Management and Research* 30, no. 1 (2025): 77–100, <https://doi.org/https://doi.org.10.33102/jfatwa.vol30no1.654>; Suud Sarim Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery," *Mutawasith* 13, no. 1 (2023): 104–16, <https://doi.org/https://doi.org.10.47971/mjhi.v6i2.748>.

¹⁰ R Andespa, "A Systematic Review of Customer Sharia Compliance Behaviour in Islamic Banks: Determinants and Behavioural Intention," *Journal of Islamic Marketing* 15, no. 4 (2023): 1013–34, <https://doi.org/https://doi.org.10.1108/jima-06-2023-0181>; Muhammad Faseeh Ullah Khan, Ahmad Saeed, and Abdul Khaliq Angaria, "A Theoretical Comparison of Interest-Free Banking and Interest-Based Banking: A Context of Pakistani Banking Industry," *Annals of Human and Social Sciences* 3, no. 2 (2022): 664–74, [https://doi.org/http://doi.org.10.35484/ahss.2022\(3-II\)63](https://doi.org/http://doi.org.10.35484/ahss.2022(3-II)63).

¹¹ H Mbaidin, "The Role of Ai Integration and Governance Standards: Enhancing Financial Reporting Quality in Islamic Banking," *Decision Science Letters* 13, no. 1 (2024): 83–98, <https://doi.org/https://doi.org.10.5267/j.dsl.2023.12.001>; Hebah Shalhoob, "The Role of AI in Enhancing Shariah Compliance: Efficiency and Transparency in Islamic Finance," *Journal of Infrastructure, Policy and Development* 9, no. 1 (2025): 1–26, <https://doi.org/https://doi.org.10.24294/jipd11239>.

expands Islamic finance's accessibility and outreach, particularly among Gen Z and Gen Alpha who are tech-savvy.¹²

Despite its advantages, AI's integration into Islamic jurisprudence presents ethical and operational challenges. A major concern is preserving human authority and accountability in fatwa issuance, as AI lacks the contextual understanding, ethical reasoning, and spiritual depth that Sharia advisors bring to jurisprudential decision-making.¹³ Hakim et al¹⁴ warns against over-reliance on AI, highlighting risks such as misinterpretations of Islamic texts and the potential erosion of scholarly oversight. To mitigate these concerns, scholars and AI developers have explored hybrid models, where AI assists rather than replaces traditional juristic reasoning. Such models emphasize human-AI collaboration, where scholars provide interpretative oversight while AI enhances efficiency in research and data analysis.¹⁵

However, Islamic scholars' acceptance of AI Solutions in fatwa formulation and other sharia aspects is still an open discussion.¹⁶ This is due to the limited clear framework and research discussing the evaluation of Sharia compliance of AI-based tools. Financial and technical barriers pose implementation challenges, particularly for smaller Islamic institutions.¹⁷ The risk of fatwa shopping, where individuals seek rulings that align with personal preferences, underscores the need for regulatory oversight to ensure AI remains a tool for scholarly assistance rather than an independent authority.¹⁸ Referring to Tsourlaki¹⁹, AI is considered a propaganda tool and competitor for religious authorities in Dubai and Egypt. The scholars are skeptical about AI's ability to fulfill Sharia compliance, especially in formulating fatwas that indirectly replace the role of muftis.²⁰

To maximize AI's potential while maintaining the integrity of Islamic jurisprudence, robust regulatory frameworks and ethical safeguards are essential. Rahim et al²¹ emphasizes the importance of human oversight to sustain trust and authenticity in AI-generated fatwas. Similarly, Setyowati & Rahayu²² argue that AI must function as a Sharia-advisory tool rather than a replacement for scholarly judgment. A collaborative approach—involving technologists, scholars, and regulators—is imperative to navigate AI's integration while upholding Islamic principles. Meanwhile, Jamal & Zakaria²³ stated that to ensure that AI can be used to formulate fatwas, AI

¹² Dwi Suhartanto et al., "Millennial Loyalty towards Artificial Intelligence-Enabled Mobile Banking: Evidence from Indonesian Islamic Banks," *Journal of Islamic Marketing* 13, no. 9 (2022): 1958–72, <https://doi.org/10.1108/JIMA-12-2020-0380>.

¹³ Widhy Setyowati and Intan Sri Rahayu, "Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors," *International Transactions on Artificial Intelligence (ITALIC)* 1, no. 2 (2023): 236–344, <https://doi.org/10.33050/italic.v1i2.334>.

¹⁴ Lukman Hakim and Muhamad Risqil Azizi, "Otoritas Fatwa Keagamaan Dalam Konteks Era Kecerdasan Buatan (Artificial Intelligence/Ai)," *Ar-Risalah Media Keislaman Pendidikan Dan Hukum Islam* 21, no. 2 (2023): 164, <https://doi.org/10.69552/ar-risalah.v21i2.2101>.

¹⁵ Ali Polat, Shoaib Khan, and Usman Bashir, "AN INQUIRY INTO THE APPLICATION OF ARTIFICIAL INTELLIGENCE ON FATWA," in *Digital Transformation in Islamic Finance*, ed. Yasushi Suzuki and Mohammad Dulal Miah, Islamic bu (New York: Routledge, 2023), 274–87, <https://doi.org/10.4324/9781003262169>.

¹⁶ Polat, Khan, and Bashir.

¹⁷ Setyowati and Rahayu, "Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors."

¹⁸ Salisu, Saniff, and Hassan, "Sharia Board of Islamic Banks and the Attitude of Fatwa Shopping."

¹⁹ Sofia Tsourlaki, "Artificial Intelligence on Sunni Islam's Fatwa Issuance in Dubai and Egypt," *Islamic Inquiries* 1, no. 2 (2022): 107–25, <https://doi.org/10.22034/IS.2022.339182.1082>.

²⁰ Tsourlaki.

²¹ Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations."

²² Setyowati and Rahayu, "Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors."

²³ M. H. N Jamal and M. Z Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance," *Salam Digest: Syariah and Law Undergraduate Symposium* 1, no. 1 (2023): 61–70.

needs to be developed by expert AI engineers and supervised by procedures that comply with the qualifications of Sharia advisors and muftis.

Based on previous studies, the analysis of AI application integration towards fatwa formulation and other sharia compliant evaluations is only limited to the risk aspect, so it is not uncommon for AI to be found as a threat. Therefore, this study aims to analyze the priority of benefits-opportunities-costs-and risks of integrating AI into fatwa formulation and Sharia opinion, which also fills the gap in previous research. If the benefits and opportunities weight higher than the costs and risks, so the idea to integrate AI into fatwa development should be promoted and accelerated, and vice versa.

II. LITERATURE REVIEW

Definition and Process of Fatwa Issuance

The concept of fatwa plays a crucial role in Islamic jurisprudence, serving as a formal legal ruling issued by a qualified Sharia advisor (mufti) in response to specific inquiries regarding Islamic law.²⁴ Derived from the Arabic root "fata," meaning to provide an answer, fatwas offer authoritative guidance on diverse issues, from personal conduct to social and financial matters. This role is particularly significant today, as Muslims seek clarity on emerging challenges in a rapidly evolving world.

Far from being arbitrary opinions, fatwas are deeply rooted in Islamic legal principles, ensuring their relevance and applicability to contemporary concerns. They address a wide range of topics, including finance, trade, and technological advancements, demonstrating the dynamic nature of Islamic law.²⁵ Beyond individual guidance, fatwas shape institutional practices, particularly in Islamic finance, where compliance with Sharia depends on the legitimacy provided by such rulings.²⁶ Their influence extends further, affecting social behavior and public policy, as seen in fatwas on public health issues, such as smoking bans issued by the Indonesian Ulama Council.²⁷

Given their pivotal role in shaping Islamic legal thought and social behavior, fatwas must be issued through a rigorous and methodical process to maintain credibility and consistency. This structured approach ensures that each fatwa is aligned with Sharia principles and effectively addresses the needs of contemporary Muslim communities.

The fatwa issuance process follows four key stages, each serving a distinct function. It begins with *al-taswir*, where the mufti carefully analyzes the mustafti's inquiry, considering its social, economic, and cultural context to ensure a precise understanding of the issue at hand.²⁸ Next, in *al-takyif*, the mufti classifies the inquiry within the framework of Islamic jurisprudence, identifying

²⁴ Setiawan Bin Lahuri and Muhammad Rizal Pranoto, "Halal Cosmetics Products Used in Islamic Boarding School Analysis of the Halal Product Standard of Fatwa (MUI)," *AL-FALAH: Journal of Islamic Economics* 7, no. 1 (2022): 1, <https://doi.org/10.29240/alfalah.v7i1.3631>.

²⁵ Ahcene Lahsasna, "Fatwa and Its Shariah Methodology in Islamic Finance," *Journal of Fatwa Management and Research* 2, no. 1 (2011): 133–79, <https://doi.org/https://doi.org/10.33102/jfatwa.vol2no1.121>.

²⁶ Hakim, "Analytical Framework in Study of Fatwas on Sharia Economics."

²⁷ Muthoifin et al., "Fatwa of the Indonesian Ulama Council Concerning the Prohibition of Smoking and the Implications on Small Traders," in *Proceedings of the 1st International Seminar on Sharia, Law and Muslim Society (ISSLAMAS 2022)*, vol. 1 (Atlantis Press SARL, 2022), 57–65, <https://doi.org/10.2991/978-2-494069-81-7>.

²⁸ Shahir Akram Hassan and Wan Mohd Khairul Firdaus Wan Khairulidin, "Research Design Based on Fatwa Making Process: An Exploratory Study," *International Journal of Higher Education* 9, no. 6 (2020): 241–46, <https://doi.org/10.5430/ijhe.v9n6p241>.

relevant legal precedents and ensuring alignment with established Sharia rulings.²⁹ Once adaptation is complete, the process moves to *al-hukm*, where the legal reasoning is articulated, providing a clear and well-structured explanation of the ruling.³⁰ Finally, in *al-ifta'*, the fatwa is formally issued, often disseminated through written documents, digital platforms, or public declarations to reach the relevant audience.³¹ In complex cases, consultations with other Sharia advisors or Sharia boards may be required to enhance legitimacy and consistency.³² While fatwas are non-binding, their authority is often shaped by the credibility of the issuing scholar and the acceptance of the community.³³

The duration of fatwa issuance varies based on complexity, urgency, and the level of scholarly engagement. Routine matters may be resolved quickly, while intricate financial or ethical dilemmas may require extensive deliberation. In times of crisis, such as during the COVID-19 pandemic, fatwa issuance can be expedited to address urgent community concerns.³⁴

As the demand for timely and well-researched fatwas increases, advancements in artificial intelligence (AI) present new possibilities for enhancing the fatwa issuance process. AI-driven tools can assist in analyzing vast amounts of legal texts, identifying relevant precedents, and improving efficiency in responding to complex inquiries. While AI cannot replace the scholarly judgment of a mufti, it can serve as a valuable tool in streamlining fatwa research, ensuring greater accuracy and accessibility while maintaining the intellectual and ethical rigor of Islamic jurisprudence.

AI and Fatwa Formulation: Insight of Benefits

One of the primary benefits of utilizing AI in fatwa issuance is its potential for increased efficiency and accessibility. AI technologies can analyze vast amounts of data, providing insights that may not be readily apparent to human scholars.³⁵ This efficiency is particularly beneficial in contexts where traditional Sharia advisors are overwhelmed by the volume of inquiries, ensuring that religious guidance is delivered in a timely and consistent manner.³⁶ AI-integrated fatwa

²⁹ Hatta Syamsuddin, M. Mu'Inudinillah Basri, and Moh. Abdul Kholiq Hasan, "Hai'ah As-Syar'iyah Al-Wathoniyah Wa Dauruha Fi Ar-Riqobah Asy-Syar'iyah 'Alal Mashorif Al-Islamiyah Fi Indunisiya Wa Manhajuh Fil Fatwa" (Universitas Muhammadiyah Surakarta, 2016).

³⁰ Mohd Harifadilah Rosidi, Ahmad Wifaq Bin Mokhtari, and Mohd Nasir Bin Abdul Majid, "Penerimaan Fatwa Dalam Kalangan Masyarakat Muslim Malaysia: Satu Tinjauan Literatur," *Journal of Fatwa Management and Research* 24, no. 1 (2021): 45–62, <https://doi.org/10.33102/jfatwa.vol24no1.335>.

³¹ Hassan and Khairuldin, "Research Design Based on Fatwa Making Process: An Exploratory Study."

³² Syamsuddin, Basri, and Hasan, "Hai'ah As-Syar'iyah Al-Wathoniyah Wa Dauruha Fi Ar-Riqobah Asy-Syar'iyah 'Alal Mashorif Al-Islamiyah Fi Indunisiya Wa Manhajuh Fil Fatwa."

³³ Mohammad Syifa Amin Widigdo and Homaidi Hamid, "The Power of Fatwā in Indonesia: An Analysis of MUP's Controversial Fatwās," *Afkaruna* 14, no. 2 (2018): 146–66, <https://doi.org/10.18196/aijjs.2018.0085.146-165>.

³⁴ Mashuri, Iffatin Nur, and Muhammad Ngizzul Muttaqin, "Maqāṣid Shari'ah Flexibility to Overcome COVID-19 in Indonesia: From Government Policies to Fatwā of Council of Indonesian Ulama (MUI), Nahdlatul Ulama (NU), and Muhammadiyah," *De Jure: Jurnal Hukum Dan Syariah* 13, no. 2 (2021): 240–63, <https://doi.org/10.18860/j-fsh.v13i2.13280>.

³⁵ Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations."

³⁶ Tsourlaki, "Artificial Intelligence on Sunni Islam's Fatwa Issuance in Dubai and Egypt"; Ana Khoirunisa et al., "Islam in the Midst of AI (Artificial Intelligence) Struggles: Between Opportunities and Threats," *Subuf* 35, no. 1 (2023): 45–52, <https://doi.org/10.23917/suhuf.v35i1.22365>; Munshi et al., "Automated Islamic Jurisprudential Legal Opinions Generation Using Artificial Intelligence"; Latifi, "Challenges of Using Artificial Intelligence in the Process of Shi'i Ijtihad"; Ahmad Bin Abdulaziz Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas," *Kurdish Studies* 12, no. 1 (2024): 2504–11, <https://doi.org/https://doi.org/10.58262/ks.v12i1.174>; Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance"; Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations"; Ferdinand Salomo Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective," *International Journal of Financial Economics* 1, no. 1 (2024): 8–25; Wael A. Farag, Muhammad Nadeem, and Magedy Helal, "Assessment Transformation in the Age of AI: Moving Beyond the Influence of Generative Tools," *Proceedings of 2024 1st Edition of the Mediterranean Smart Cities Conference, MSCC 2024*, no. May (2024),

dissemination reduces geographical barriers, making religious rulings more accessible across different regions. Moreover, data collection and analysis on fatwas become more comprehensive, improving the quality of religious rulings.³⁷

Additionally, automation reduces costs by minimizing the need for employed muftis while increasing fatwa processing efficiency.³⁸ AI can categorize fatwas by subject, Shariah advisors opinions, and references, making them easier to retrieve and analyze.³⁹ It also enhances fatwa translation and adaptation into multiple languages, improving accessibility for diverse Muslim communities.⁴⁰ AI ensures standardization of fatwas, reducing subjective interpretation across different regions.⁴¹ Moreover, AI assists muftis in contextual analysis and supplements Ijtihad by providing an initial framework for fatwa formulation.⁴² With real-time monitoring, AI keeps fatwas updated per Shariah principles, ensuring relevance in contemporary contexts.⁴³ AI also simplifies Shariah compliance decision-making and aligns financial, educational, and humanitarian initiatives with Islamic principles, further strengthening its role in modern Islamic governance.⁴⁴

AI and Fatwa Formulation: Insight of Costs

The integration of AI in religious contexts presents significant ethical, regulatory, and technical challenges, particularly in fatwa issuance and Islamic finance. While AI can enhance efficiency and accessibility, concerns remain about its role as a Shariah advisor and its ability to operate within Islamic ethical standards.⁴⁵ One major challenge is the limited number of certified muftis and weak religious leadership, which can hinder the effective implementation of AI-assisted fatwa development.⁴⁶ Additionally, accessibility issues persist, particularly in rural and developing

<https://doi.org/10.1109/MSCC62288.2024.10697011>; Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery”; Ahmed, “The Status of the Use of Artificial Intelligence in Ijtihad”; Mohammad Fattahun Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority ? An Ethical Review on IslamGPT,” *Al’Adalah: Journal of Islamic Studies* 27, no. 1 (2024): 71–84; Hero Gefthi Firnando and Muhammad Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services,” *JIEP: Journal of Islamic Economics and Philanthropy* 6, no. 3 (2024): 53–61, <https://ejournal.unida.gontor.ac.id/index.php/JIEP/index>.

³⁷ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery.”

³⁸ Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas”; Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery.”

³⁹ Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas.”

⁴⁰ Alshithisri; Jamal and Zakaria, “Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance.”

⁴¹ Soleh Hasan Wahid and Anjar Kususiyanah, “The Relevance of the Usage of Artificial Intelligence and Machine Learning in Legal Analysis (An Analysis of Legal Provisions in the National Sharia Council Fatwa and Financial Services Authority Regulation Using Plagiarism Checker and ATLAS.Ti),” *Proceedings of the 1st International Conference on Research in Social Sciences and Humanities (ICORSH 2020)* 584, no. Icorsh 2020 (2020): 926–36; Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective”; Saeed Ahmed Saleh Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example,” *Kurdish ...* 12, no. 1 (2024): 2905–23, <https://doi.org/https://doi.org/10.58262/ks.v12i1.208> Using; Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services.”

⁴² Ahmed, “The Status of the Use of Artificial Intelligence in Ijtihad”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority ? An Ethical Review on IslamGPT.”

⁴³ Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective.”

⁴⁴ Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services.”

⁴⁵ Setyowati and Rahayu, “Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors.”

⁴⁶ Tsourlaki, “Artificial Intelligence on Sunni Islam’s Fatwa Issuance in Dubai and Egypt”; Munshi et al., “Automated Islamic Jurisprudential Legal Opinions Generation Using Artificial Intelligence”; Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas.”

areas where infrastructure and resources for AI applications are inadequate.⁴⁷ AI systems also face bias risks due to generative models, imbalanced datasets, algorithmic design flaws, and cultural misinterpretations, further exacerbated by a lack of diversity in AI development teams.⁴⁸ The lack of transparency, accountability, and interpretability in AI-driven fatwa systems raises additional concerns about their reliability.⁴⁹ Furthermore, regulatory complexities across different jurisdictions challenge the authority of AI-generated fatwas, necessitating stronger governance frameworks.⁵⁰

Privacy concerns are another significant issue, as AI applications in Islamic finance and fatwa issuance handle sensitive personal and religious data, requiring strict safeguards against misuse.⁵¹ Moreover, AI-generated fatwas raise legal validity concerns, as Shariah advisors must verify their accuracy and Shariah compliance, ensuring AI does not replace human religious authority.⁵² Cybersecurity risks also threaten AI-driven Islamic finance and legal systems, necessitating robust security measures to prevent data breaches and manipulation.⁵³ One of the most pressing challenges is the high cost of AI development, requiring significant investment in infrastructure, specialized training, and adaptation to evolving Shariah interpretations.⁵⁴ Additionally, there remains a lack of standardized legal and governance frameworks to accommodate AI-driven Shariah compliance, making its widespread adoption difficult.⁵⁵ Lastly, ensuring AI applications consistently adhere to Shariah principles remains a critical concern, requiring continuous oversight and alignment with Islamic jurisprudence.⁵⁶ Despite these challenges, AI has the potential to transform Islamic finance and fatwa issuance, provided that its implementation is ethically sound, legally structured, and technologically secure.

⁴⁷ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example.”

⁴⁸ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Jamal and Zakaria, “Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance”; Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT”; Ahmed, “The Status of the Use of Artificial Intelligence in Ijtihad”; Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas.”

⁴⁹ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery.”

⁵⁰ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad.”

⁵¹ Tsourlaki, “Artificial Intelligence on Sunni Islam’s Fatwa Issuance in Dubai and Egypt”; Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery.”

⁵² Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT.”

⁵³ Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery”; Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective.”

⁵⁴ Hasan Wahid and Kususiyanah, “The Relevance of the Usage of Artificial Intelligence and Machine Learning in Legal Analysis (An Analysis of Legal Provisions in the National Sharia Council Fatwa and Financial Services Authority Regulation Using Plagiarism Checker and ATLAS.Ti)”; Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example”; Setyowati and Rahayu, “Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors”; Mohammad Azam Hussain et al., “The Potential Prospect of Artificial Intelligence (AI) in Arbitration from the International, National and Islamic Perspectives,” *Journal of International Studies* 19, no. 1 (2023): 92–122, <https://doi.org/https://doi.org/10.32890/jis2023.19.1.4>; Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective”; Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services.”

⁵⁵ Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective”; Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example”; Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services.”

⁵⁶ Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services.”

AI and Fatwa Formulation: Insight of Opportunities

The opportunity for AI to enhance the quality of fatwas is significant, as it can improve fatwa formulation, accessibility, and inclusivity within the Muslim community. AI-augmented analysis of e-fatwas allows advanced algorithms to identify recurring themes and concerns, giving Shariah advisors a deeper understanding of their communities' needs.⁵⁷ This capacity to analyze large datasets enhances fatwa comprehensiveness, making them more relevant to contemporary societal challenges.⁵⁸ The rapid growth of the global Muslim population further necessitates digital fatwa development, ensuring that Islamic teachings remain accessible and preserved in the digital era.⁵⁹ Automating data collection streamlines fatwa formulation, allowing scholars to process inquiries more efficiently.⁶⁰ Additionally, AI empowers scholars to guide dynamic Muslim communities through real-time religious advisory systems.⁶¹ AI also plays a key role in developing decision-support tools for Islamic legal experts, enabling structured and well-informed fatwa issuance.⁶²

Beyond fatwa issuance, AI presents transformative educational and financial applications within Islamic studies and Islamic finance. AI-driven tools expand access to Islamic legal services globally, offering scholars and students valuable resources for research and jurisprudence analysis.⁶³ Furthermore, AI facilitates international collaboration and knowledge exchange in fatwa formulation, allowing Shariah advisors from different regions to synchronize their interpretations and rulings.⁶⁴ In the financial sector, AI accelerates Shariah compliance evaluation in Islamic capital markets, providing AI-powered investment recommendations that align with Islamic ethical standards.⁶⁵ AI also offers innovative tools to address modern challenges in Islamic finance and jurisprudence, improving risk assessment, regulatory compliance, and ethical decision-making.⁶⁶ However, these advancements necessitate rigorous oversight to ensure AI remains aligned with Shariah principles, preventing the unintended promotion of practices that conflict with Islamic

⁵⁷ Jonas Svensson, "Prayer, Dreams, and Sex: A Showcase of an AI-Augmented Distant Reading of 20 Thousand E-Fatwas," *CyberOrient* 18, no. 1 (2024): 4–39.

⁵⁸ Svensson; Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas"; Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery."

⁵⁹ Tsourlaki, "Artificial Intelligence on Sunni Islam's Fatwa Issuance in Dubai and Egypt"; Munshi et al., "Automated Islamic Jurisprudential Legal Opinions Generation Using Artificial Intelligence"; Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas"; Firnando and Wahyudi, "The Role of Artificial Intelligence in Shaping Islamic Finance Services."

⁶⁰ Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas"; Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery."

⁶¹ Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance."

⁶² Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery."

⁶³ Karimullah; Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective"; Farag, Nadeem, and Helal, "Assessment Transformation in the Age of AI: Moving Beyond the Influence of Generative Tools"; Hasan Wahid and Kususiyannah, "The Relevance of the Usage of Artificial Intelligence and Machine Learning in Legal Analysis (An Analysis of Legal Provisions in the National Sharia Council Fatwa and Financial Services Authority Regulation Using Plagiarism Checker and ATLAS.Ti)"; Firnando and Wahyudi, "The Role of Artificial Intelligence in Shaping Islamic Finance Services."

⁶⁴ Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery"; Hussain et al., "The Potential Prospect of Artificial Intelligence (AI) in Arbitration from the International, National and Islamic Perspectives"; Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective"; Farag, Nadeem, and Helal, "Assessment Transformation in the Age of AI: Moving Beyond the Influence of Generative Tools."

⁶⁵ Setyowati and Rahayu, "Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors"; Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective"; Firnando and Wahyudi, "The Role of Artificial Intelligence in Shaping Islamic Finance Services."

⁶⁶ Farag, Nadeem, and Helal, "Assessment Transformation in the Age of AI: Moving Beyond the Influence of Generative Tools."

teachings.⁶⁷

AI and Fatwa Formulation: Insight of Risks

The risks associated with AI in fatwa issuance extend beyond ethical concerns to misinterpretations, ideological dominance, and diminished human oversight. Given the complexity of Islamic jurisprudence, AI systems must be meticulously trained to prevent biases and errors that could result in misguided religious rulings.⁶⁸ Current AI models primarily identify lexical similarities between user queries and pre-registered fatwas but lack deep comprehension of religious contexts, increasing the risk of inaccurate or misleading responses.⁶⁹ Additionally, AI could standardize fatwas, inadvertently overlooking regional and contextual diversity in Islamic rulings.⁷⁰ A more alarming concern is the potential misuse of AI to propagate ideological biases, leading to the global dominance of certain interpretations and the exploitation of AI to spread radical ideologies that contradict Islamic teachings.⁷¹ Furthermore, AI-generated fatwas may lack spiritual depth, reducing religious guidance to mere data-driven outputs without the holistic wisdom of traditional Islamic scholarship.⁷²

Beyond these interpretative risks, AI's role in fatwa issuance raises questions of accountability, transparency, and authority. Who bears responsibility for AI-generated fatwas? This issue is crucial, as it directly affects trust in Islamic jurisprudence and the role of Sharia advisors in overseeing AI-driven decisions.⁷³ The increasing reliance on AI threatens to diminish human scholars' involvement in fatwa formulation, potentially sidelining deductive reasoning (*istinbat*) and *Ijtihad* in Islamic legal processes.⁷⁴ This concern is particularly relevant in cases where fatwa shopping—seeking favorable religious rulings—can already complicate the integrity of Islamic

⁶⁷ Setyowati and Rahayu, “Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors.”

⁶⁸ Rahim et al., “Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations”; Tsourlaki, “Artificial Intelligence on Sunni Islam’s Fatwa Issuance in Dubai and Egypt”; Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT”; Hussain et al., “The Potential Prospect of Artificial Intelligence (AI) in Arbitration from the International, National and Islamic Perspectives”; Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective.”

⁶⁹ Tsourlaki, “Artificial Intelligence on Sunni Islam’s Fatwa Issuance in Dubai and Egypt”; Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT”; Hussain et al., “The Potential Prospect of Artificial Intelligence (AI) in Arbitration from the International, National and Islamic Perspectives.”

⁷⁰ Rahim et al., “Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations.”

⁷¹ Tsourlaki, “Artificial Intelligence on Sunni Islam’s Fatwa Issuance in Dubai and Egypt”; Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT.”

⁷² Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example.”

⁷³ Rahim et al., “Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations.”

⁷⁴ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas”; Khoirunisa et al., “Islam in the Midst of AI (Artificial Intelligence) Struggles: Between Opportunities and Threats”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT”; Ahmed, “The Status of the Use of Artificial Intelligence in Ijtihad”; Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective”; Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example”; Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services.”

guidance.⁷⁵ AI-based fatwa issuance also raises data security concerns, as sensitive religious information could be manipulated or misused, leading to violations of privacy and distortions of Islamic rulings.⁷⁶ Additionally, bias within AI algorithms could impact the fairness of religious rulings, further challenging AI's credibility in Islamic jurisprudence.⁷⁷ Resistance from scholars skeptical of AI's ability to adhere to Shariah interpretations also poses a barrier to AI adoption in Islamic jurisprudence.⁷⁸ To address these risks, it is essential to develop ethical and regulatory frameworks ensuring that AI remains a tool for scholarly assistance rather than a replacement for traditional Islamic legal reasoning while also upholding data confidentiality and religious integrity.⁷⁹

Table 1. Previous Studies on AI in Fatwa Formulation: Benefits, Opportunities, Costs, and Risks

Benefit	References
AI-integrated fatwa dissemination is more efficient with fewer geographical barriers.	Tsourlaki (2022); Munshi et al (2022); Latifi (2024); Alshithisri (2024); Jamal & Zakaria (2023); Khoirunnisa et al. (2023); Leuwol et al (2024); Farag et al (2024); Karimullah (2023); Ahmed (2021); Niam (2024); Firnando & Wahyudi (2023)
Data collection and analysis on fatwas become more comprehensive.	Latifi (2024); Karimullah (2023)
Automation reduces costs by minimizing the need for employed muftis.	Alshithisri (2024); Karimullah (2024)
AI categorizes fatwas by subject, Sharia advisor opinions, and references.	Alshithisri (2024)
AI translates and adapts fatwas into multiple languages.	Alshithisri (2024); Jamal & Zakarian(2023)
AI ensures fatwa standardization by reducing subjective interpretation.	Wahid & Kususiyanah (2020); Leuwol et al (2024); Farag et al (2024); Firnando & Wahyudi (2023)
AI assists muftis in contextual analysis and supplements Ijtihad.	Ahmed (2021); Niam (2024)
Real-time monitoring keeps fatwas updated per Shariah principles.	Leuwol et al (2024)
AI simplifies Shariah compliance decision-making.	Firnando & Wahyudi 2023

⁷⁵ Salisu, Saniff, and Hassan, "Sharia Board of Islamic Banks and the Attitude of Fatwa Shopping."

⁷⁶ Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas"; Hasan Wahid and Kususiyanah, "The Relevance of the Usage of Artificial Intelligence and Machine Learning in Legal Analysis (An Analysis of Legal Provisions in the National Sharia Council Fatwa and Financial Services Authority Regulation Using Plagiarism Checker and ATLAS.Ti)"; Khoirunisa et al., "Islam in the Midst of AI (Artificial Intelligence) Struggles: Between Opportunities and Threats."

⁷⁷ Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective"; Farag et al., "Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example"; Firnando and Wahyudi, "The Role of Artificial Intelligence in Shaping Islamic Finance Services."

⁷⁸ Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective"; Farag et al., "Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example"; Firnando and Wahyudi, "The Role of Artificial Intelligence in Shaping Islamic Finance Services."

⁷⁹ Firnando and Wahyudi, "The Role of Artificial Intelligence in Shaping Islamic Finance Services."

Aligns financial, educational, and humanitarian initiatives with Islamic principles.	Firnando & Wahyudi 2023
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Opportunity	
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The rapid growth of the global Muslim population drives digital fatwa development and preserves Islamic heritage.	Tsourlaki (2022); Munshi et al (2022); Alshithisri (2024); Firnando & Wahyudi (2024)
Automating data collection enhances fatwa formulation.	Alshithisri (2024); Karimullah (2023)
Empowers Sharia advisors to guide dynamic Muslim communities in the digital era.	Jamal & Zakarian(2023)
Develops decision-support tools for Islamic legal experts.	Karimullah (2023)
AI as a learning tool expands access to Islamic legal services globally.	Karimullah (2023); Leuwol et al (2024); Farag et al (2024); Wahid & Kususiyanah (2020); Firnando & Wahyudi (2024)
Facilitates international collaboration and knowledge exchange in fatwa formulation.	Karimullah (2023); Hussain et al. (2023); Leuwol et al (2024); Farag et al (2024)
AI integration with Islamic FinTech accelerates Shariah compliance evaluation and product development.	Setyowati & Rahayu (2023); Leuwol et al (2024); Firnando & Wahyudi 2023
Provides innovative tools to address modern challenges in Islamic finance and jurisprudence.	Farag et al (2024)
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Cost	
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Limited certified muftis and weak religious leadership hinder AI-assisted fatwa development.	Tsourlaki (2022); Munshi et al (2022); Latifi (2024); Alshithisri (2024)
Accessibility issues due to inadequate infrastructure and resources in rural and developing areas.	Latifi (2024); Farag et al (2024)
AI bias risks from generative models, imbalanced data, algorithm design, cultural context, and lack of diversity in AI development teams.	Latifi (2024); Jamal & Zakaria (2023); Karimullah (2023); Niam (2024); Ahmed (2021); Alshithisri (2024)
Lack of transparency, accountability, and interpretability in AI-driven fatwa systems.	Latifi (2024); Karimullah (2023)
Regulatory complexities create challenges in AI fatwa authority across different legal frameworks.	Latifi (2024)
Privacy concerns over personal data and religious sensitivities in AI applications.	Tsourlaki (2022); Latifi (2024); Latifi (2024); Karimullah (2023)
Legal validity of AI-generated fatwas requires scholars to verify accuracy and compliance.	Karimullah (2023); Niam (2024)
Cybersecurity risks pose threats to AI-based Islamic finance and legal systems.	Karimullah (2023); Leuwol et al (2024)
High development costs for AI infrastructure, training, and adaptation to evolving Shariah interpretations.	Wahid & Kususiyanah (2020); Setyowati & Rahayu (2023); Hussain et al. (2023); Leuwol et al (2024); Farag et al (2024); Firnando & Wahyudi (2024)
Insufficient legal and governance frameworks to accommodate AI-driven Shariah compliance.	Leuwol et al (2024); Farag et al (2024); Firnando & Wahyudi (2024)
Ensuring AI applications consistently adhere to Shariah principles.	Firnando & Wahyudi (2024)
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Risk	
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AI only identifies lexical similarities between user-typed questions and previously registered fatwas (AI does not comprehend the deep meaning of the question or its references), making it prone to producing inaccurate responses to the issue being asked.	Tsourlaki (2022); Latifi (2024); Alshithisri (2024); Niam (2024); Hussain et al. (2023); Leuwol et al (2024)
The dominance of a particular ideology in Islam on a global scale could emerge, leading to potential misuse and exploitation in spreading misinterpretations and radical ideologies that contradict Islamic teachings.	Tsourlaki (2022); Latifi (2024); Niam (2024)
The weakening of deductive reasoning (<i>istinbat</i>) in fatwa formulation and the marginalization of Sharia advisors, as all matters related to fatwas may be entirely entrusted to AI.	Latifi (2024); Alshithisri (2024); Khoirunnisa et al. (2023); Niam (2024); Ahmed (2021); Luwol et al (2024); Farag et al (2024); Firnando & Wahyudi (2024)
AI-generated fatwas may be distorted or manipulated, posing risks of data breaches and the misuse of sensitive Islamic rulings.	Alshithisri (2024); Wahid & Kususiyanah (2020); Khoirunnisa et al. (2023); Wahid & Kususiyanah (2020)
Bias in AI algorithms can affect the fairness of fatwa issuance.	Leuwol et al (2024); Farag et al (2024); Firnando & Wahyudi (2024)
Rejection from scholars who are skeptical of AI's capacity to adhere to Shariah interpretations.	Leuwol et al (2024); Farag et al (2024); Firnando & Wahyudi (2024)
Fatwas may lack spiritual depth if they are entirely generated by AI.	Farag et al (2024)
Ensuring that AI respects confidentiality in handling religious matters.	Firnando & Wahyudi (2024)

III. DATA AND METHOD

This research uses the Analytic Network Process (ANP) method and the Benefit, Opportunity, Cost, and Risk (BOCR) analysis approach. Ascarya⁸⁰ explains that the Analytic Network Process (ANP) method is a new approach to qualitative methods, which is non-parametric and non Bayesian, for a decision-making process. Jharkharia & Shankar⁸¹ state that Analytic Network Process is a comprehensive decision-making technique that has the ability to include all relevant and interrelated criteria to reach a decision. ANP can also be explained as a calculation theory that is typically used in the dominance of influence, in which case ANP creates a comparison between variables related to the attributes possessed or the fulfillment of a criterion.⁸² In other words, the ANP method is utilized in solving with consideration of adjusting the complexity of the problem in a synthetic decomposition accompanied by a priority scale that produces the greatest priority influence. Decision making in ANP applications is by considering and validating empirical experience. The network structure used makes this method possible to identify, classify and organize all factors that affect the output or the resulting decision.⁸³

Then, BOCR analysis is used in this research because to determine a priority decision has consequences that must be considered both negative and positive. In addition, the BOCR

⁸⁰ Ascarya, *Analytic Network Process (ANP) Pendekatan Baru Dalam Penelitian Kualitatif* (Jakarta (ID): Pusat Pendidikan dan Studi Kebanksentralan Bank Indonesia, 2005).

⁸¹ Sanjay Jharkharia and Ravi Shankar, "Selection of Logistics Service Provider: An Analytic Network Process (ANP) Approach," *Omega* 35, no. 3 (2007): 274–89, <https://doi.org/10.1016/j.omega.2005.06.005>.

⁸² Thomas L Saaty and Luis G Vargas, *Decision Making With the Economic, Political, Social and Technological Applications with Benefits, Opportunities, Costs and Risks, Manufacturing Systems*, vol. 95, 2006, <http://www.amazon.com/dp/0387338594>.

⁸³ Saaty and Vargas.

approach can be used to make decisions that can be implemented in the short and long term.⁸⁴ The ANP BOCR research method has three phases, as described in the figure below.

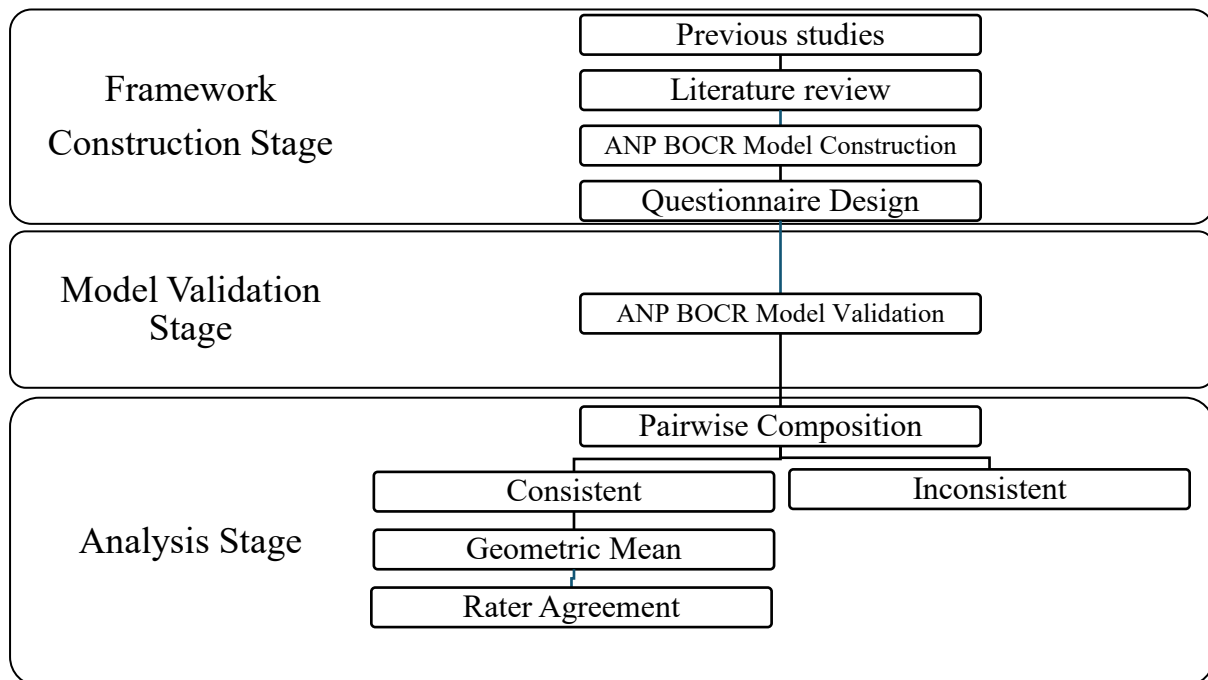


Figure 1. ANP BOCR Research Stage

In the first stage, namely the frame construction stage through relevant previous research and conducting a literature review. The analysis is aimed at collecting benefits, opportunities, problems/costs, and risks that have been described and analyzed by previous researchers. Next, form a BOCR model based on the results of the literature review analysis, which then designs a research questionnaire to determine and analyze the priority aspects of the BOCR criteria and sub criteria. This research questionnaire is a pairwise comparison of the benefits, opportunities, costs, and risks of aspects related to the use of AI for fatwa formulation. The pairwise comparison assessment of this questionnaire uses a scale of 1-9, where 1 means not important/needed/affected and 9 means absolutely important/needed/affected. In the second stage, the BOCR model was validated in more depth based on the model construction that had been obtained in the literature review analysis. After that, the research questionnaire was handed over to the respondents and the respondents were asked to fill in the research questionnaire which would be used for the next stage. The third stage is data analysis to calculate the priority value of each aspect of BOCR formulated using Microsoft Excel and Super Decisions software.

At the data analysis stage, the geometric mean of each respondent was calculated, as well as Kendall's Coefficient of Concordance (Kendall's W) to determine the level of agreement among raters or respondents. The Kendall's Coefficient (W) value indicates perfect or strong agreement among respondents if $W = 1$. If $W = 0$, it indicates disagreement or a weak level of agreement among respondents, and if $0 < W < 1$, it indicates a greater or lesser level of agreement among

⁸⁴ Tika Widiastuti et al., "Integrating Sustainable Islamic Social Finance: An Analytical Network Process Using the Benefit Opportunity Cost Risk (ANP BOCR) Framework: The Case of Indonesia," *PLoS ONE* 17, no. 5 May (2022): 1–20, <https://doi.org/10.1371/journal.pone.0269039>.

raters or respondents, where higher values indicate a higher level of agreement.⁸⁵ Legendre⁸⁶ explains the calculation for Kendall's coefficient (W) such that, for example, object i is rated r_{ij} by rater number j, where there are a total of n objects and m raters, the total rating given to object i is as follows:

$$R_i = \sum_j^m = 1r_{i,j}$$

The average of the total ratings follows the following formula:

$$R = \frac{1}{2}m(n + 1)$$

The sum of squared deviations (S) is calculated by the formula:

$$S = \sum_i^n = 1(R_i - \bar{R})^2$$

Kendall's W coefficient is formulated as follows:

$$W = \frac{13S}{m^2(n^3 - n)}$$

W is Kendall's coefficient, n is the total objects, m is the total raters, and S is the sum of squared deviations.

Furthermore, the data used in this research is primary data obtained through in-depth interviews and discussions as well as ANP questionnaires filled out by respondents. Data sources were collected from 20 expert respondents from academia, practitioners, and regulators. The purposive sampling technique was used to select expert respondents who fit the required criteria. The criteria for respondents in this study are: (1) Respondents are experts in the fields of technology, artificial intelligence, Islamic finance, Islamic economics, and Islamic fatwa from academics, practitioners, and regulators, (2) have more than two publications of journal articles in related fields for academics and have important positions and are relevant to the topic of this research, for example as a Sharia Supervisory Board (DPS) for practitioners and regulators.

In the end, this study used 13 experts from practitioners and academics as respondents in this study. In Analytic Network Process (ANP) research, the justification for the number of respondents prioritizes expertise over quantity, as this method relies on the mature judgment of individuals with specialized knowledge in the subject area and is carefully selected following certain criteria: expertise relevant to the research question, diversity of expertise, and dedication to the research inquiry.⁸⁷ In other words, this method is specifically designed for expert judgment rather

⁸⁵ Mohammad Mahbubi Ali et al., "Islamic Financial Inclusion Determinants in Indonesia: An ANP Approach," *International Journal of Islamic and Middle Eastern Finance and Management* 13, no. 4 (2020): 727–47, <https://doi.org/10.1108/IMEFM-01-2019-0007>.

⁸⁶ Pierre Legendre, "Species Associations: The Kendall Coefficient of Concordance Revisited," *Journal of Agricultural, Biological, and Environmental Statistics* 10, no. 2 (2005): 226–45, <https://doi.org/10.1198/108571105X46642>.

⁸⁷ Thomas L Saaty and Luis G Vargas, *Decision Making with The Economic, Political, Social, and Technological Applications with Benefits, Opportunities, Costs, and Risks, Manufacturing Systems*, vol. 95, 2006; Widiastuti et al., "Integrating Sustainable Islamic Social Finance: An Analytical Network Process Using the Benefit Opportunity Cost Risk (ANP BOCR) Framework: The Case of Indonesia"; Hien Ngoc Nguyen et al., "Datasets of Skills-Rating Questionnaires for Advanced Service Design through Expert Knowledge Elicitation," *Scientific Data* 9, no. 1 (2022): 1–7, <https://doi.org/10.1038/s41597-022-01421-3>.

than statistical inference. Nevertheless, according to empirical guidelines, an expert panel should consist of at least 10 participants to ensure validity in ANP studies.⁸⁸ Saaty⁸⁹ also stated that in the ANP method, the assessment can be done by one expert, but in practice 2-10 experts are used so that the results are more representative and reliable. Unlike quantitative research that requires large samples for statistical power, ANP focuses on capturing nuanced interdependencies through structured pairwise comparisons, where the validity of the results depends on the respondents' ability to evaluate complex criteria relationships.⁹⁰ As such, this methodological approach allows researchers to break down unstructured problems into rational hierarchical decision elements and elicit prioritized decisions from experts through focused questionnaires.⁹¹ The following is information related to research respondent data.

Table 2. ANP Respondent Profile

No	Representative	Years of Experience	Position
1	Academics/Sharia Advisor	8	Assistant Professor
2	Academics/Sharia Advisor	18	Lecturer, Member of National and International Ulema Council
3	Practitioner/Academics/Sharia Advisor	10	Sharia Supervisory Board & Lecturer
4	Academics/Sharia Advisor	14	Lecturer
5	Practitioner/Academics/Sharia Advisor	22	Sharia Supervisory Board & Lecturer
6	Academics/Sharia Advisor	3	Dean of the Faculty of Sharia, Sharia Supervisory Board
7	Academics	12	Professor in Islamic Finance
8	Academics	23	Professor in Islamic Accounting
9	Academics/Sharia Advisor	16	Head of Islamic Economics Post Graduate Program
10	Academics/Sharia Advisor	18	Lecturer, former Head of Islamic Law Department
11	Academics/Sharia Advisor	3	Lecturer
12	Academics/Sharia Advisor	19	Head of Islamic Law Department
13	Academics/Sharia Advisor	32	Professor in Islamic Finance

Then, the following figure shows the ANP BOCR framework of AI utilization in the Islamic decision-making process.

⁸⁸ Nguyen et al., "Datasets of Skills-Rating Questionnaires for Advanced Service Design through Expert Knowledge Elicitation."

⁸⁹ Thomas L Saaty, *Decision Making with Dependence and Feedback: The Analytic Network Process* (USA: RWS Publications, 1996).

⁹⁰ Widiastuti et al., "Integrating Sustainable Islamic Social Finance: An Analytical Network Process Using the Benefit Opportunity Cost Risk (ANP BOCR) Framework: The Case of Indonesia."

⁹¹ Nguyen et al., "Datasets of Skills-Rating Questionnaires for Advanced Service Design through Expert Knowledge Elicitation."

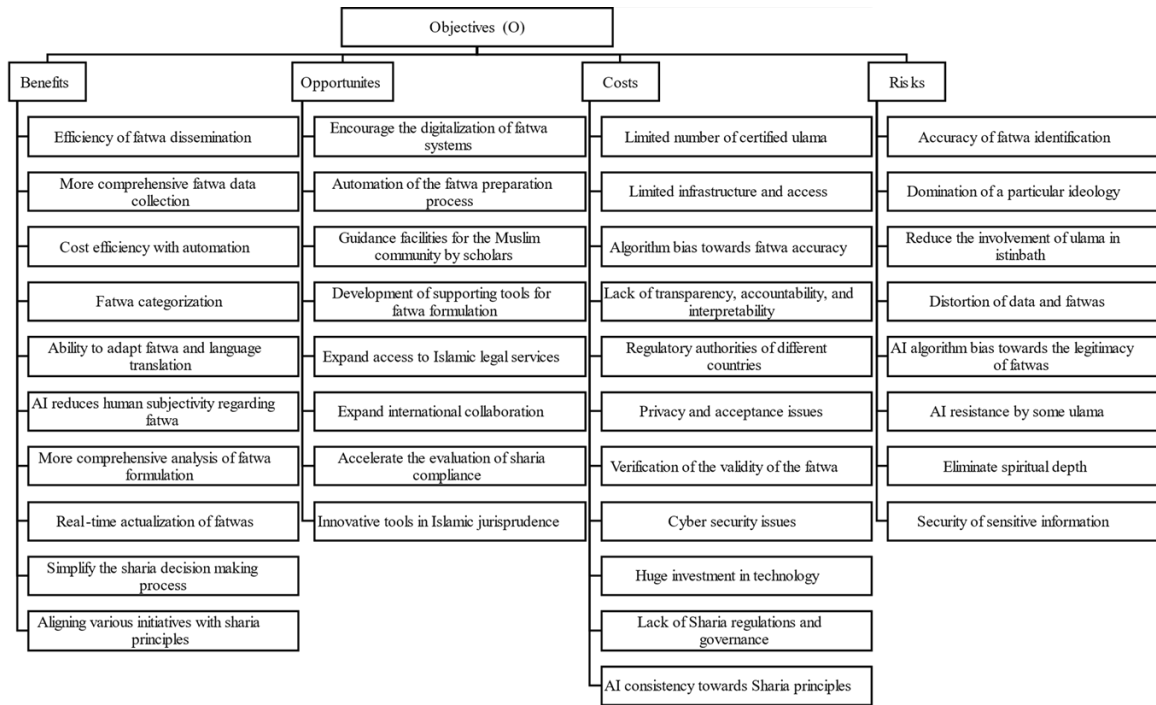


Figure 2. ANP BOCR Framework

Based on the ANP framework above, Figure 3 shows the ANP network regarding the utilization of AI in the sharia decision-making process.

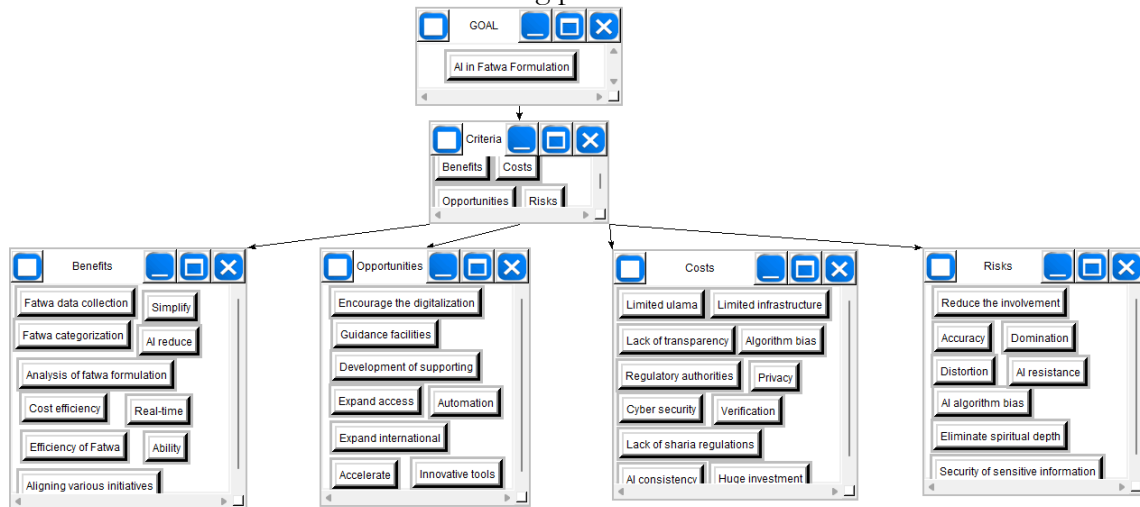


Figure 3. ANP Network of AI and Fatwa Formulation

IV. FINDING AND DISCUSSION

This study aims to analyze the use of AI in the fatwa formulation process using the Analytic Network Process (ANP) BOCR model. Based on the ANP analysis of the four criteria—Benefits, Opportunities, Costs, and Risks (BOCR)—the results indicate that the Benefits criterion holds the highest priority, with an average weight of 0.269. This is followed by Costs (0.261), Opportunities (0.259), and Risks (0.211). Additionally, the rater agreement value was found to be 0.02, indicating a weak level of agreement among respondents.

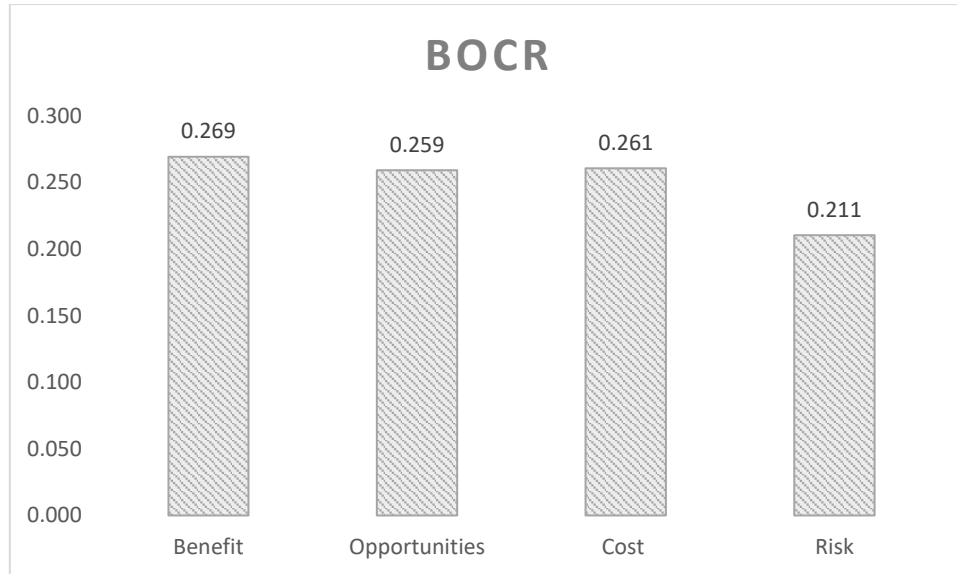


Figure 4. ANP BOCR Analysis Results

Further analysis of the BOCR results per respondent is presented in the following table:

Table 3. BOCR Priority: Respondents Insight

Respondents	Benefits	Opportunities	Cost	Risk
R1	0.095	0.160	0.467	0.277
R2	0.424	0.122	0.227	0.227
R3	0.224	0.097	0.617	0.062
R4	0.333	0.333	0.167	0.167
R5	0.122	0.227	0.424	0.227
R6	0.467	0.277	0.095	0.160
R7	0.277	0.467	0.160	0.095
R8	0.200	0.400	0.200	0.200
R9	0.351	0.351	0.109	0.189
R10	0.200	0.400	0.200	0.200
R11	0.122	0.227	0.227	0.424
R12	0.200	0.200	0.200	0.400
R13	0.485	0.109	0.297	0.109
Mean	0.269	0.259	0.261	0.211

The results indicate that, overall, respondents perceive **Benefits** as the most significant criterion, followed by Costs, Opportunities, and Risks. This suggests that stakeholders recognize the potential advantages of AI in fatwa formulation while also acknowledging the financial, technical, and operational investments required for its implementation—especially within the Sharia-compliant Islamic finance industry. Although the Opportunities criterion ranks slightly lower than Benefits and Costs, it remains an important factor. This suggests that respondents see potential future benefits from integrating AI into the fatwa formulation process. Risks, on the other hand, have the lowest average weight, implying that respondents consider them less influential compared to other criteria.

Individually, the table also shows variations in respondents' views. Based on their opinion and weight on BOCR, three categories could be made: optimistic, cautious, and balanced. Respondents R5, R8, and R10 assigned relatively equal weights across all BOCR criteria, suggesting a more neutral or balanced perspective on AI adoption. Respondents R2, R4, R6, R7, R8, R9, R10,

and R13 prioritized Benefits or Opportunities, demonstrating optimism about AI's potential. R13 assigned the highest weight to Benefits (0.485), showing strong confidence in AI's advantages. R7, R8, and R10 placed significant emphasis on Opportunities (0.467 and 0.400, respectively), indicating their belief in AI's future potential. Respondents R1, R3, R5, R11, and R12 assigned higher weights to Costs and/or Risks, indicating a more cautious stance toward AI adoption. R3 assigned the highest weight to Costs (0.617), reflecting concerns about the financial and operational burden of AI implementation in fatwa formulation. R11 (0.424) and R12 (0.400) gave higher importance to Risks, demonstrating that they consider the potential threats the main concern.

The table below presents the overall geometric mean analysis results from respondents for each element of the BOCR criteria.

Table 4. Priority of Each Element inside BOCR Aspect

Criteria	Elements	Mean
Benefits	Efficiency of fatwa dissemination	0,109
	More comprehensive fatwa data collection	0,101
	Cost efficiency with automation	0,065
	Fatwa categorization	0,101
	Ability to adapt fatwa and language translation	0,117
	AI reduces human subjectivity regarding fatwa	0,074
	More comprehensive analysis of fatwa formulation	0,130
	Real-time actualization of fatwa	0,102
	Simplify the sharia decision making process	0,093
	Aligning various initiatives with sharia principles	0,107
Opportunities	Encourage the digitalization of fatwa systems	0,137
	Automation of the fatwa preparation process	0,142
	Guidance facilities for the muslim community by Sharia advisors	0,128
	Development of supporting tools for fatwa formulation	0,127
	Expand access to islamic legal services	0,114
	Expand international collaboration	0,129
Costs	Accelerate the evaluation of sharia compliance	0,117
	Innovative tools in islamic jurisprudence	0,106
	Limited number of certified ulama	0,080
	Limited infrastructure and access	0,085
	Algorithm bias towards fatwa accuracy	0,094
	Lack of transparency, accountability, and interpretability	0,100
	Regulatory authorities of different countries	0,069
	Privacy and acceptance issues	0,058
	Verification of the validity of the fatwa	0,129
Cyber security issues	0,097	
Risks	Huge investment in technology	0,092
	Lack of sharia regulations and governance	0,100
	AI consistency towards sharia principles	0,096
	Accuracy of fatwa identification	0,123
	Domination of a particular ideology	0,130
	Reduce the involvement of ulama in istinbath	0,148

Distortion of data and fatwas	0,136
AI algorithm bias towards the legitimacy of fatwas	0,107
AI resistance by some ulama	0,116
Eliminate spiritual depth	0,126
Security of sensitive information	0,115

The application of artificial intelligence (AI) in assisting Sharia advisors in formulating fatwas is a significant technological advancement in Islamic jurisprudence, which offers both opportunities and challenges. AI systems, particularly those utilizing Natural Language Processing (NLP)⁹² and machine learning models such as recurrent neural networks (RNNs)⁹³ and transformers, can analyze large amounts of religious texts, historical fatwas, and legal precedents to identify patterns and generate contextually relevant responses.⁹⁴ For example, NLP algorithms are specifically designed to interpret the linguistic nuances of classical Islamic texts, allowing AI to extract deep meanings and support scholars in addressing modern ethical dilemmas. These capabilities allow AI to streamline the process of issuing fatwas by handling repetitive questions, reducing the workload on human scholars, and ensuring consistency in rulings across similar cases.⁹⁵

However, AI integration raises ethical and practical issues. While AI excels at processing large data sets and providing quick responses, it lacks the empathic judgment and contextual

⁹²Natural Language Processing (NLP) is a specialized area in artificial intelligence (AI) that focuses on enabling computers to understand, interpret and produce human language in a meaningful and context-appropriate manner. Sitting at the intersection of linguistics, computer science and AI, NLP seeks to bridge the communication gap between humans and machines, enabling more natural and intuitive interactions. Modern NLP utilizes advanced algorithms, such as neural networks and transformer architectures, to process large amounts of text and extract meaningful patterns. These methods are able to handle linguistic nuances, idioms, and even cultural contexts, which were previously challenging for computational models. As a result, NLP has become an integral part of various applications, including search engines, content recommendation systems, virtual assistants, and automated customer service. Yanhan Chen et al., "Artificial Intelligence Methods in Natural Language Processing: A Comprehensive Review," *Highlights in Science, Engineering and Technology* 85 (2024): 545–50, <https://doi.org/10.54097/vfwg09>; Mehmet Beyaz, "Natural Language Processing in Medicine: An Overview," *SCIREA Journal of Information Science and Systems Science* 7, no. 4 (2023): 75–88, <https://doi.org/https://doi.org/10.54647/iss120314>; Nimrat Kaur Brar, "Natural Language Processing in Artificial Intelligence, NLPinAI 2021," *International Journal of Novel Research and Development (IJNRD)* 8, no. 8 (2023): 286–89.

⁹³ Recurrent Neural Networks (RNN) are a class of artificial neural networks designed to process sequential or temporal data by maintaining an internal "memory" of previous inputs through feedback loops. Unlike feed-forward networks, RNNs utilize sequential dependencies to inform predictions, which makes them highly effective for tasks such as language translation, speech recognition, and time series analysis. Its architecture incorporates hidden states that capture contextual information from previous time steps, which allows the network to model dynamic temporal behavior. Ibomoiye Domor Mienye, Theo G. Swart, and George Obaido, "Recurrent Neural Networks: A Comprehensive Review of Architectures, Variants, and Applications," *Information* 15, no. 9 (2024): 517, <https://doi.org/10.3390/info15090517>; Susmita Das et al., "Recurrent Neural Networks (RNNs): Architectures, Training Tricks, and Introduction to Influential Research," in *Machine Learning for Brain Disorders*, ed. Olivier Colliot, Vol. 197 (New York: Neuromethods, 2023); Alex Sherstinsky, "Fundamentals of Recurrent Neural Network (RNN) and Long Short-Term Memory (LSTM) Network," *Physica D: Nonlinear Phenomena* 404, no. March (2020): 1–43, <https://doi.org/10.1016/j.physd.2019.132306>.

⁹⁴ Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations"; Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance."

⁹⁵ Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations"; Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance."

awareness required for nuanced religious rulings.⁹⁶ In addition, AI-generated fatwas may introduce bias in decision-making.⁹⁷ To mitigate these risks, scholars emphasize the importance of maintaining human oversight, where AI serves as a support tool, not a replacement for the mufti. A collaborative framework involving Islamic jurists, AI developers, and ethicists is essential to ensure AI systems are aligned with Shariah principles, prioritize justice, and uphold accountability.⁹⁸ The study proposes a hybrid model where AI handles the initial data analysis and drafting of fatwas, while Sharia advisors hold the final authority to review, contextualize, and approve rulings.⁹⁹ This approach leverages AI's efficiency in information retrieval and pattern recognition while maintaining the irreplaceable role of human expertise in interpreting religious texts and dealing with moral complexities.¹⁰⁰

Benefits Cluster Analysis

The table explains that the benefit criterion with the highest weight is More comprehensive analysis of fatwa formulation (0.130). This indicates that stakeholders see significant value in AI's capacity to improve the depth and accuracy of fatwa-related decision-making and ensure its validity in accordance with Shariah principles. Then, the most significant opportunity criterion was Automation of the fatwa preparation process (0.142), which explains that stakeholders have a strong belief in AI's potential to streamline and accelerate fatwa preparation and improve efficiency in the fatwa formulation process. Furthermore, the Cost criterion found that the highest weighted element was associated with verifying the validity of fatwas (0.139). This represents a concern about the resources and effort required to ensure that fatwas generated from AI integration are accurate, reliable, and compliant with Shariah principles. Finally, the most critical risk criterion is data and fatwa distortion (0.156), which describes concerns about the potential for AI systems to misinterpret or misrepresent Shariah principles, potentially providing false or misleading information and undermining trust in the system.

The results of the ANP benefit analysis illustrating these findings are presented in the following figure:

⁹⁶ Shoayb Ahmed, "Fatwā and AI: A Literature-Based Assessment On How AI Impacts the Role of the Muftī," *Journal for Islamic Studies* 1, no. 2 (2024): 1–19, <https://doi.org/https://doi.org/10.25159/2957-9163/14400>; Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas."

⁹⁷ Ahmed, "Fatwā and AI: A Literature-Based Assessment On How AI Impacts the Role of the Muftī"; Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations."

⁹⁸ Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations"; Ahmed, "Fatwā and AI: A Literature-Based Assessment On How AI Impacts the Role of the Muftī."

⁹⁹ Rahim et al., "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations"; Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance."

¹⁰⁰ Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas"; Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance."

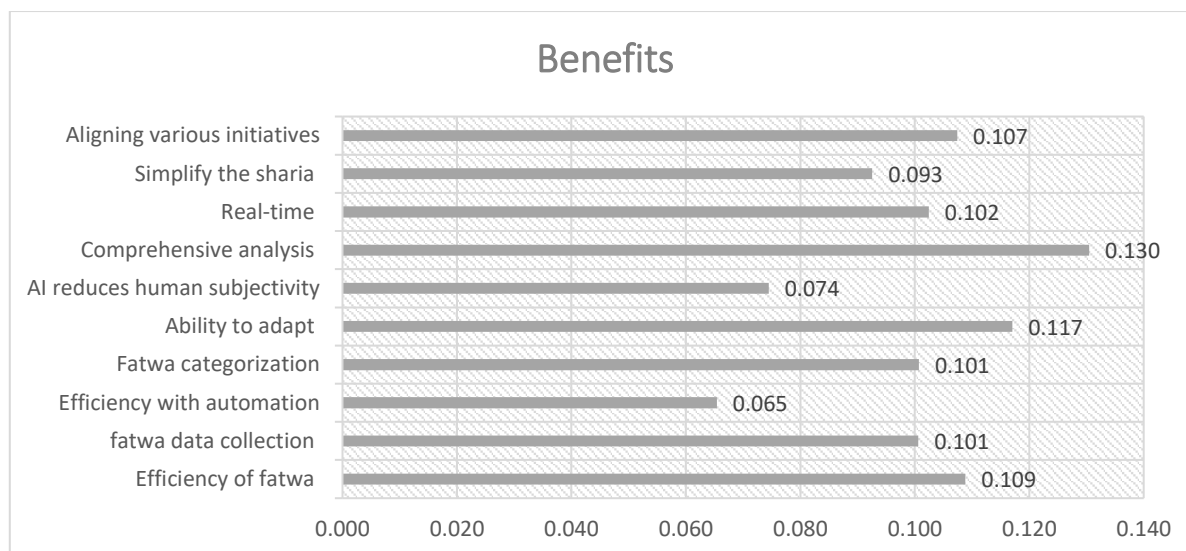


Figure 5. ANP Analysis Results Benefits Criteria

Based on the analysis, it was found that in utilizing AI and formulating fatwas in a sharia-compliant manner, it is important to focus on the benefits, while still considering the costs and risks. The benefits of AI in fatwa formulation can include various things, ranging from efficiency benefits, accessibility, to the ability to collect data. It is also explained in the research of Leuwol et al¹⁰¹, Farag et al¹⁰², Polat et al¹⁰³ and Tsourlaki¹⁰⁴ that the benefits of AI integration in fatwa formulation or decision making are more efficient in terms of analysis, fatwa dissemination, and more accessible to various parties. In addition, in the financial aspect, AI also facilitates the automation of routine tasks, such as data entry and document processing, minimizing losses and improving overall operational efficiency.¹⁰⁵ Then, based on the top priority on the benefit criteria, it was also found that the use of AI provides a more comprehensive analysis. This is also expressed in the research of Latifi¹⁰⁶ and Karimullah¹⁰⁷ that data collection and data analysis related to a fatwa become more comprehensive by utilizing AI. Ahmed¹⁰⁸ and Niam¹⁰⁹ also emphasized that AI can help Sharia advisors in contextual analysis and complement the previously designed Ijtihad. This is done because AI can categorize and organize fatwas and sharia rulings based on subjects, jurist opinions, and references.¹¹⁰ AI also has the ability to translate and adapt sharia fatwas and rulings into other languages.¹¹¹

Accordingly, AI can enhance the role of Shariah advisors by improving efficiency and accuracy in data-driven tasks while maintaining human authority over nuanced jurisprudential

¹⁰¹ Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective."

¹⁰² Farag et al., "Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example."

¹⁰³ Polat, Khan, and Bashir, "AN INQUIRY INTO THE APPLICATION OF ARTIFICIAL INTELLIGENCE ON FATWA."

¹⁰⁴ Tsourlaki, "Artificial Intelligence on Sunni Islam's Fatwa Issuance in Dubai and Egypt."

¹⁰⁵ Nneka Adaobi Ochuba, Adetumi Adewumi, and David Olanrewaju Olutimehin, "The Role of Ai in Financial Market Development: Enhancing Efficiency and Accessibility in Emerging Economies," *Finance & Accounting Research Journal* 6, no. 3 (2024): 421–36, <https://doi.org/10.51594/farj.v6i3.969>.

¹⁰⁶ Latifi, "Challenges of Using Artificial Intelligence in the Process of Shi'i Ijtihad."

¹⁰⁷ Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery."

¹⁰⁸ Ahmed, "The Status of the Use of Artificial Intelligence in Ijtihad."

¹⁰⁹ Niam, "Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT."

¹¹⁰ Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas."

¹¹¹ Alshithisri; Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance."

interpretations. AI systems excel at processing large amounts of classical texts, legal precedents, and fatwa databases, allowing scholars to quickly identify historical patterns and rulings relevant to contemporary cases.¹¹² For example, machine learning algorithms can analyze decades of inheritance disputes to suggest faraid-compliant asset distributions, reducing calculation errors and allowing scholars to focus on contextual ethical evaluations.¹¹³ In Islamic finance, AI-powered blockchain systems provide real-time Sharia compliance monitoring for transactions, while robo-advisory tools generate initial screening reports-both of which function as decision support mechanisms rather than autonomous arbiters.¹¹⁴ Crucially, AI lacks the capacity to interpret *maqāṣid al-sharī‘ah* (the higher purpose of Islamic law) or balance competing ethical priorities in new situations, areas where human scholars remain indispensable.¹¹⁵ By delegating repetitive analytical tasks to AI, the Shariah advisors can allocate more time to interdisciplinary consultations, public education, and the refinement of ethical frameworks for emerging technologies.¹¹⁶ This symbiotic relationship ensures AI functions as a *mukallaf al-asghar* (subordinate tool) under scientific supervision, maintaining alignment with the principles of Islamic law while modernizing administrative processes.¹¹⁷

Opportunities Cluster Analysis

The opportunities criteria encompass eight key elements that highlight the potential advantages of AI integration in fatwa development. These elements include encouraging the digitalization of fatwa systems, automation of the fatwa preparation process, guidance facilities for the Muslim community by Sharia advisors, development of supporting tools for fatwa formulation, expand access to Islamic legal services, expand international collaboration, accelerate the evaluation of sharia compliance, and innovative tools in Islamic jurisprudence. The results of the ANP opportunity analysis can be seen in the figure below:

¹¹² Mawaddah et al., “Artificial Intelligence as a Catalyst for Modernizing Islamic Family Law,” *Al-Mujtabid: Journal of Islamic Family Law* 4, no. 2 (2024): 73–85, <https://doi.org/http://dx.doi.org/10.30984/ajifl.v4i2.3295>.

¹¹³ Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery”; Sukindar et al., “Legal Innovation in Religious Courts: The Potential Utilization of Artificial Intelligence (AI) in Resolving Contemporary Cases,” *MILRev: Metro Islamic Law Review* 3, no. 2 (2024): 388–410, <https://doi.org/10.3176/https://doi.org/10.32332/milrev.v3i2.8199hem.geol.1975.2.10>.

¹¹⁴ Nurfarahin Mohd Haridan et al., “What Do Shariah Boards Think About Ai?,” *Jurnal Bisnis Terapan* 7, no. 2 (2023): 115–27, <https://doi.org/10.24123/jbt.v7i2.6061>.

¹¹⁵ Rahim et al., “Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations”; Mawaddah et al., “Artificial Intelligence as a Catalyst for Modernizing Islamic Family Law.”

¹¹⁶ Haridan et al., “What Do Shariah Boards Think About Ai?”

¹¹⁷ Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery”; Mawaddah et al., “Artificial Intelligence as a Catalyst for Modernizing Islamic Family Law.”

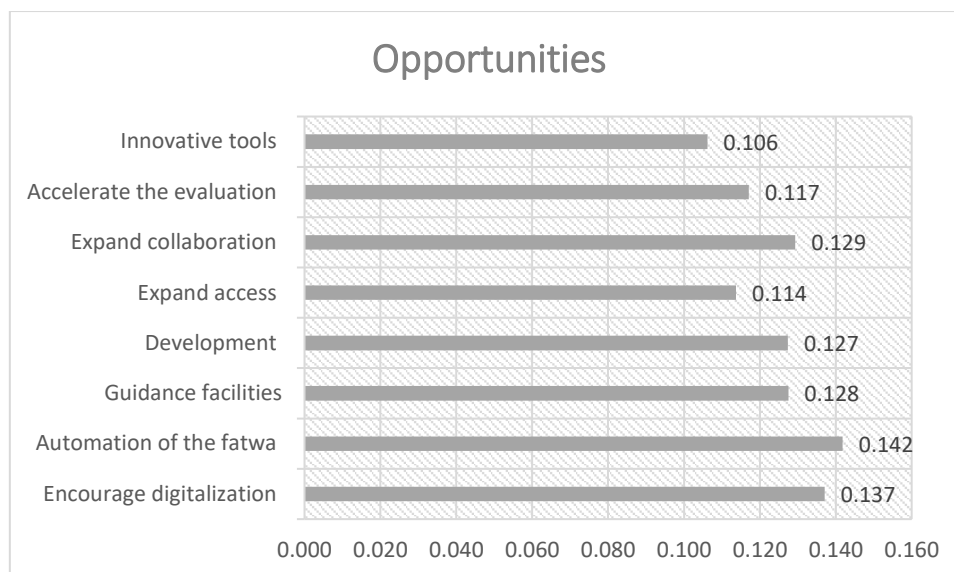


Figure 6. ANP Analysis Results Opportunities Criteria

Based on the figure, the highest-priority element is the automation of the fatwa preparation process, with a geometric mean value of 0.142. Additionally, the rater agreement value was found to be 0.03. This indicates a weak level of agreement between raters.

This is also confirmed in the research of Alshithisri¹¹⁸ and Karimullah¹¹⁹ that process automation by AI can help in fatwa formulation or sharia decision making, especially in the automation of data collection. AI, through natural language processing (NLP) techniques, can quickly process and analyze a large number of religious texts, including the Qur'an and Hadith, allowing Sharia advisors to issue fatwas that are contextually relevant to contemporary issues. Alshithisri¹²⁰ and Rahman et al¹²¹ state that AI can identify patterns and relationships among various texts, facilitating a more informed interpretation of Islamic law. On the other hand, if there is disagreement among scholars, AI can collect and analyze various viewpoints, to provide a comprehensive understanding of the discourse of a fatwa or sharia-compliant. This process improves the quality of fatwas by ensuring that they are based on extensive data analysis rather than isolated opinions.¹²² In the financial aspect, AI can automate the process of credit scoring, customer service, and fraud detection, which is in line with research from Leuwol et al¹²³, Setyowati & Rahayu¹²⁴, and Firnando & Wahyudi¹²⁵ that the integration of AI with Islamic financial institutions can help accelerate the evaluation of Sharia compliance in the Islamic financial system and develop Islamic financial products. Similarly, research from Sa'ad et al¹²⁶ explains that accepting Robo-advisors in the Islamic banking and financial system can simplify and facilitate

¹¹⁸ Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas."

¹¹⁹ Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery."

¹²⁰ Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas."

¹²¹ M. E. Rahman, F. Syahriani, and W. Jampa, "Islamic Law in The Digital Era: Artificial Intelligence as A Revolutionary Legal Tool in The 21st Century," *Al-Hurriyah: Jurnal Hukum Islam* 9, no. 2 (2024): 102–15, <https://doi.org/http://dx.doi.org/10.30983/al-hurriyah.v9i2.8545>.

¹²² Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas"; Jamal and Zakaria, "Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance."

¹²³ Leuwol et al., "Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective."

¹²⁴ Setyowati and Rahayu, "Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors."

¹²⁵ Firnando and Wahyudi, "The Role of Artificial Intelligence in Shaping Islamic Finance Services."

¹²⁶ Auwal Adam Sa'ad et al., "Robo-Advisory for Islamic Financial Institutions: Shari'ah and Regulatory Issues," *European Journal of Islamic Finance*, 2020, 1–9.

Sharia supervision activities in Islamic financial services. In addition, the use of AI such as Robo-advisors can also facilitate research, generate data, analyze, and even execute fatwas in a very short time.¹²⁷

Cost Cluster Analysis

The subsequent analysis focuses on the cost criteria, which consist of eleven key elements. They are: limited number of certified ulama, limited infrastructure and access, algorithm bias towards fatwa accuracy, lack of transparency, accountability, and interpretability, regulatory authorities of different countries, privacy and acceptance issues, verification of the validity of the fatwa, cyber security issues, huge investment in technology, lack of sharia regulations and governance, and AI consistency towards sharia principles. The results of ANP analysis of cost criteria can be seen in the figure below:

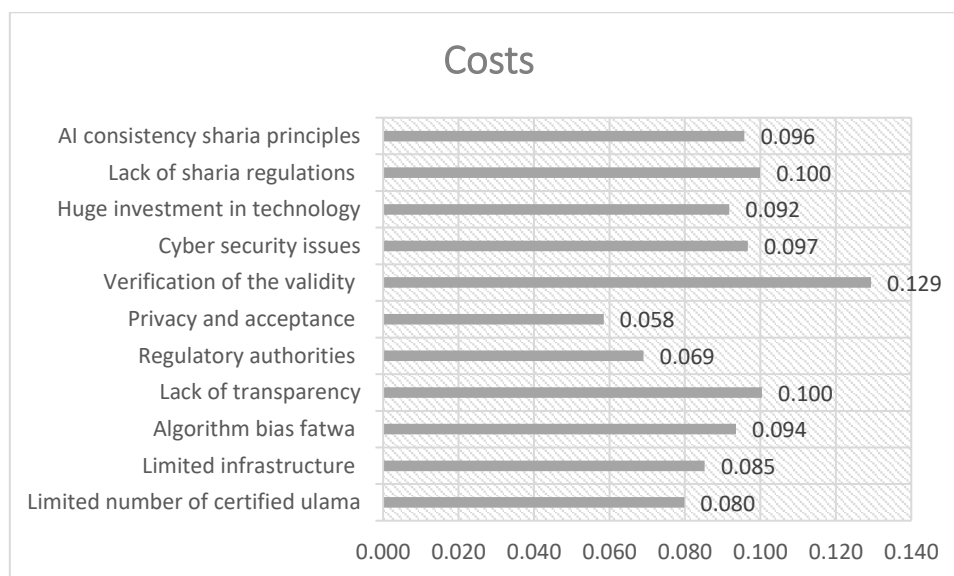


Figure 7. ANP Analysis Results Costs Criteria

Based on the figure, it can be explained that the top priority in these criteria is verification of the validity of the fatwa with a geometric mean of (0.129). In addition, it is known that the rater agreement value is 0.15. This indicates a weak level of agreement between raters.

Karimullah¹²⁸ and Niam¹²⁹ explain that the legal validity of AI-generated fatwas requires Sharia advisors to verify accuracy and compliance. This allows the burden to arise for scholars in validating AI-generated fatwas to ensure the accuracy of AI. On the other hand, the limited number of certified or qualified Sharia advisors and the weak role of scholars and religious communities¹³⁰ further complicate the legal validity process which in turn impacts the high operational costs. Similarly, it was highlighted in Shalhoob's¹³¹ research that while AI can improve operational efficiency, the initial setup and ongoing maintenance costs can be prohibitive for many Islamic Financial Institutions. In other words, the cost of developing and maintaining AI

¹²⁷ Sa'ad et al.

¹²⁸ Karimullah, "The Application of Artificial Intelligence in Islamic Law Discovery."

¹²⁹ Niam, "Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT."

¹³⁰ Latifi, "Challenges of Using Artificial Intelligence in the Process of Shi'i Ijtihad"; Alshithisri, "A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas"; Tsourlaki, "Artificial Intelligence on Sunni Islam's Fatwa Issuance in Dubai and Egypt"; Munshi et al., "Automated Islamic Jurisprudential Legal Opinions Generation Using Artificial Intelligence."

¹³¹ Shalhoob, "The Role of AI in Enhancing Shariah Compliance : Efficiency and Transparency in Islamic Finance."

infrastructure as well as training Sharia law experts and specialized resources to adapt to evolving interpretations and rulings requires substantial investment.¹³² Therefore, it is important to establish collaboration between scholars, technologists, lawyers, economists, and other related fields to address the unique challenges posed by AI in validating the Islamic legal framework.

On the other hand, the integration of artificial intelligence (AI) into fatwa issuance presents significant challenges regarding transparency, accountability and interpretability. AI systems, particularly deep learning models, often operate as “black boxes”, making it difficult for Sharia advisors and users to trace the reasoning behind the resulting fatwas.¹³³ This lack of transparency stems from the inherent complexity of algorithms such as transformers and recurrent neural networks (RNNs), which process massive amounts of textual data but obscure the decision-making path.¹³⁴ Without an explainable framework, stakeholders are unable to verify whether AI outputs align with the principles of the Qur'an, Sunnah, or scientific consensus, undermining trust in the system.¹³⁵ Although, establishing such collaborative networks can be costly and time-consuming, as it involves bringing together experts from different fields to create comprehensive fatwas that are relevant and applicable.¹³⁶

Risk Cluster Analysis

Finally, the risk criteria analysis focuses on eight key elements. Those are: accuracy of fatwa identification, domination of a particular ideology, reducing the involvement of ulama in the *istinbath* process, distortion of data and fatwas, AI algorithm bias towards the legitimacy of fatwas, AI resistance by some ulama, eliminate spiritual depth, and security of sensitive information. The results of ANP analysis of risk criteria can be seen in the figure below:

¹³² Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective”; Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example”; Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services”; Setyowati and Rahayu, “Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors”; Hussain et al., “The Potential Prospect of Artificial Intelligence (AI) in Arbitration from the International, National and Islamic Perspectives”; Hasan Wahid and Kususiyanah, “The Relevance of the Usage of Artificial Intelligence and Machine Learning in Legal Analysis (An Analysis of Legal Provisions in the National Sharia Council Fatwa and Financial Services Authority Regulation Using Plagiarism Checker and ATLAS.Ti)”

¹³³ Rahim et al., “Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations”; Israa Musa Al-momani, “Ethical Challenges for Using Artificial Intelligence in Understanding Islamic Jurisprudence,” *Salud, Ciencia y Tecnología - Serie de Conferencias* 4, no. 1519 (2025): 1–9, <https://doi.org/10.56294/sctconf20251519>.

¹³⁴ Rahim et al., “Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations.”

¹³⁵ Rahim et al.

¹³⁶ Ridwan Malik, Abdul Malik, and Mega Mustika, “Artificial Intelligence and Islamic Law : Ethical Implications and Fiqh Fatwas in the Digital Age,” *Journal of Family Law and Islamic Court* 3, no. December (2024): 128–43; Polat, Khan, and Bashir, “AN INQUIRY INTO THE APPLICATION OF ARTIFICIAL INTELLIGENCE ON FATWA.”

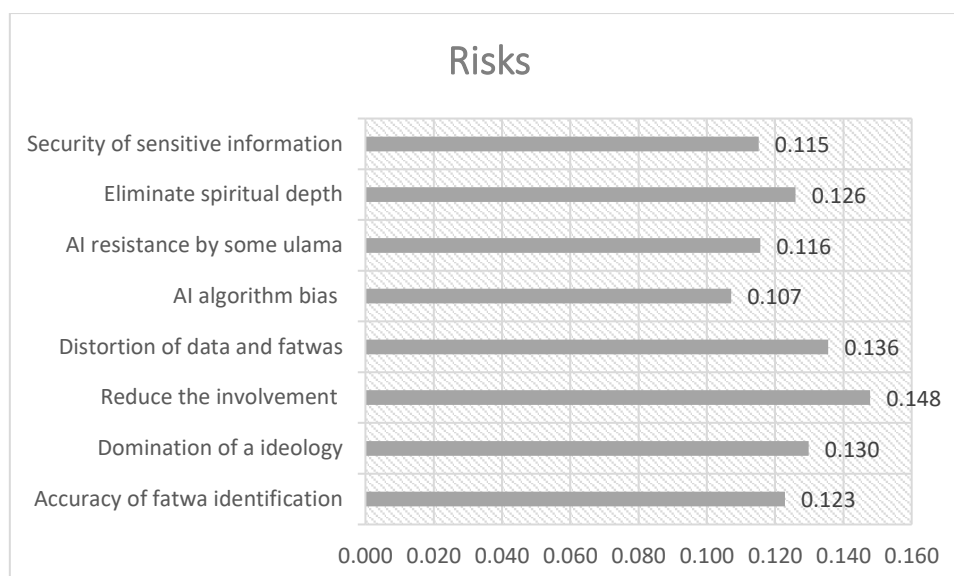


Figure 8. ANP Analysis Results Risk Criteria

Based on the figure, the highest-priority element is the reduction of the involvement of ulama in the *istinbath* process with the geometric mean of 0.148. The value of rater agreement is 0.02 indicating a weak level of agreement between raters.

The weakening of the ability of deduction process (*istinbat*) in fatwa and the elimination of the involvement of ulama could happen when the formulation of fatwa or sharia-compliant is fully entrusted to AI.¹³⁷ As a result, it may lead to fatwas lacking spiritual depth if they are entirely conducted by AI.¹³⁸ Another problem is that AI-generated data or fatwas can be distorted or twisted, leading to potential data breaches and misuse of sensitive Islamic rulings.¹³⁹ This also creates the potential for bias in the formulation of fatwas generated by AI. The risk of AI bias stems from generative models, unbalanced data, algorithm design, cultural context, and lack of diversity in the AI development team in monitoring the data analysis performed by AI.¹⁴⁰ In addition, bias that occurs in AI algorithms can also affect the reasonableness of fatwa issuance.¹⁴¹

¹³⁷ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective”; Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example”; Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services”; Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority ? An Ethical Review on IslamGPT”; Khoirunisa et al., “Islam in the Midst of AI (Artificial Intelligence) Struggles: Between Opportunities and Threats”; Ahmed, “The Status of the Use of Artificial Intelligence in Ijtihad.”

¹³⁸ Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example.”

¹³⁹ Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas”; Hasan Wahid and Kususiyannah, “The Relevance of the Usage of Artificial Intelligence and Machine Learning in Legal Analysis (An Analysis of Legal Provisions in the National Sharia Council Fatwa and Financial Services Authority Regulation Using Plagiarism Checker and ATLAS.Ti).”

¹⁴⁰ Latifi, “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad”; Jamal and Zakaria, “Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance”; Karimullah, “The Application of Artificial Intelligence in Islamic Law Discovery”; Niam, “Does Artificial Intelligence Go beyond the Limits of Religious Authority ? An Ethical Review on IslamGPT”; Ahmed, “The Status of the Use of Artificial Intelligence in Ijtihad”; Alshithisri, “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas.”

¹⁴¹ Leuwol et al., “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective”; Farag et al., “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example”; Firnando and Wahyudi, “The Role of Artificial Intelligence in Shaping Islamic Finance Services.”

Research by Niam¹⁴², Latifi¹⁴³ and Tsourlaki¹⁴⁴ also emphasized that AI can create the dominance of certain ideologies in Islam globally so that it has the potential to be misused and exploited in spreading wrong interpretations and radical ideologies that are not in accordance with Islamic law. Thus, the role of ulama is very important in the utilization of AI for the sharia-compliant process, especially as a supervisory actor and the validity of fatwas while still conducting *istinbath* and manual examination of a fatwa and decision to be issued.

V. CONCLUDING REMARK

This study aims to analyze the priority of benefits, opportunities, costs, and risks aspects from integrating AI into fatwa formulation. The result shows that the benefits cluster has the highest priority. Next priorities in order are the aspects of costs, opportunities, and risks. Among the cluster of benefits, the AI's capability to enable comprehensive data collection and analysis is considered as the most significant. The second most important benefit is AI's ability to provide multilingual translation which enables the wider adaptation of the fatwas. As for the category of costs, the primary concern is the need for scholarly verification and validation of the AI-generated fatwas. The next major issue is transparency and accountability. In terms of opportunities, the potential for fatwa automation in the future and the development of a digital fatwa ecosystem rank the highest. However, the possible weakening of scholarly authority is the key risk identified. Additionally, potential manipulation, distortion, and cyber threats are next major issues.

Given these findings, it is essential to develop proper implementation strategies and educational initiatives on AI's application in fatwa and Sharia opinions issuance, including for Muftis and Sharia Supervisory Board members. AI has the potential to enhance efficiency in the formulation and dissemination of fatwas, helping to bridge the gap between the supply and demand for Sharia opinions in the IFIs. However, considering the inequalities in AI advancements across different countries and regions, the involvement of Sharia authorities and adherence to ethical principles remain critical. Therefore, establishing a legal framework to regulate the role and utilization of AI in fatwa formulation may be necessary in the near future. This would ensure that the benefits and opportunities of AI are optimized while minimizing the associated costs and risks.

Theoretically, this study contributes to the growing literature on digital transformation in Islamic jurisprudence by offering a structured prioritization of AI-related implications in fatwa issuance. It advances previous work by mapping AI's integration not merely as a technological innovation but as a jurisprudential tool that supports rather than supplants *ijtihad* (independent reasoning). The study adds to Islamic legal discourse by proposing a decision-making framework that incorporates both technological and ethical dimensions, offering a reference model for future Islamic legal scholarship in the digital age.

For practical implementation, several strategies are proposed. First, capacity building is needed through structured training programs and AI literacy workshops for muftis and Sharia Supervisory Board members to enhance understanding of AI tools. Second, institutions should adopt a hybrid fatwa model, where AI acts as a supportive system for preliminary analysis, while final rulings remain under human scholarly authority. Third, pilot projects should be conducted within selected Islamic Financial Institutions (IFIs) to test AI-assisted fatwa issuance, allowing for controlled evaluation before broader application. Fourth, multi-stakeholder collaboration is critical—technologists, jurists, ethicists, and regulators must work together to design AI systems that respect the spiritual and ethical boundaries of Islamic law.

¹⁴² Niam, "Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT."

¹⁴³ Latifi, "Challenges of Using Artificial Intelligence in the Process of Shi'i Ijtihad."

¹⁴⁴ Tsourlaki, "Artificial Intelligence on Sunni Islam's Fatwa Issuance in Dubai and Egypt."

For future research, scholars are encouraged to investigate several key areas. First, empirical studies on community acceptance of AI-assisted fatwas can provide insight into trust, legitimacy, and adoption. Second, researchers should explore the development of AI-Sharia compliance algorithms, ensuring that machine learning models can be trained on authenticated sources with interpretative oversight. Third, longitudinal studies on the impact of AI on fatwa standardization and diversity across jurisdictions could offer valuable data for global harmonization efforts. Finally, legal scholars should investigate the evolution of regulatory and fiqh-based frameworks that guide AI use in Islamic legal contexts, including digital ethics and data governance. In conclusion, while the integration of AI into fatwa formulation offers transformative benefits for efficiency, accessibility, and scalability, it must be approached with careful planning, scholarly guidance, and regulatory foresight. A balanced model—anchored in Islamic values and supported by technology—can serve to enrich Islamic jurisprudence while meeting the demands of contemporary Islamic finance and society.

REFERENCES

- Ahmed, B. “The Status of the Use of Artificial Intelligence in Ijtihad.” *Karachi Islamicus* 1, no. 1 (2021): 1–14. <http://www.karachiislamicus.com/index.php/ki/article/view/5>.
- Ahmed, Shoayb. “Fatwā and AI: A Literature-Based Assessment On How AI Impacts the Role of the Muftī.” *Journal for Islamic Studies* 1, no. 2 (2024): 1–19. <https://doi.org/https://doi.org/10.25159/2957-9163/14400>.
- Al-momani, Israa Musa. “Ethical Challenges for Using Artificial Intelligence in Understanding Islamic Jurisprudence.” *Salud, Ciencia y Tecnología - Serie de Conferencias* 4, no. 1519 (2025): 1–9. <https://doi.org/10.56294/sctconf20251519>.
- Ali, Mohammad Mahbubi, Abrista Devi, Hafas Furqani, and Hamzah Hamzah. “Islamic Financial Inclusion Determinants in Indonesia: An ANP Approach.” *International Journal of Islamic and Middle Eastern Finance and Management* 13, no. 4 (2020): 727–47. <https://doi.org/10.1108/IMEFM-01-2019-0007>.
- Alshithisri, Ahmad Bin Abdulaziz. “A Study of the Legal and Fiqhi Impact of AI on Issuing Fatwas.” *Kurdish Studies* 12, no. 1 (2024): 2504–11. <https://doi.org/https://doi.org/10.58262/ks.v12i1.174>.
- Andespa, R. “A Systematic Review of Customer Sharia Compliance Behaviour in Islamic Banks: Determinants and Behavioural Intention.” *Journal of Islamic Marketing* 15, no. 4 (2023): 1013–34. <https://doi.org/https://doi.org/10.1108/jima-06-2023-0181>.
- Ascarya. *Analytic Network Process (ANP) Pendekatan Baru Dalam Penelitian Kualitatif*. Jakarta (ID): Pusat Pendidikan dan Studi Kebanksentralan Bank Indonesia, 2005.
- Beyaz, Mehmet. “Natural Language Processing in Medicine: An Overview.” *SCIREA Journal of Information Science and Systems Science* 7, no. 4 (2023): 75–88. <https://doi.org/https://doi.org/10.54647/iss120314>.
- Bisyri, Mohammad Hasan. “Fatwa as a Tool of Social Engineering: The Study of Fatwa of Tarjih Muhammadiyah.” *Jurnal Penelitian* 17, no. 2 (2020): 131–44. <https://doi.org/10.28918/jupe.v17i2.2986>.
- Brar, Nimrat Kaur. “Natural Language Processing in Artificial Intelligence, NLPinAI 2021.” *International Journal of Novel Research and Development (IJNRD)* 8, no. 8 (2023): 286–89.
- Chen, Yanhan, Hanxuan Wang, Kaiwen Yu, and Ruoshui Zhou. “Artificial Intelligence Methods in Natural Language Processing: A Comprehensive Review.” *Highlights in Science, Engineering and Technology* 85 (2024): 545–50. <https://doi.org/10.54097/vfwgas09>.
- Das, Susmita, Amara Tariq, Thiago Santos, Sai Sandeep Kantareddy, and Imon Banerjee. “Recurrent Neural Networks (RNNs): Architectures, Training Tricks, and Introduction to

- Influential Research.” In *Machine Learning for Brain Disorders*, edited by Olivier Colliot, Vol. 197. New York: Neuromethods, 2023.
- Farag, Saeed Ahmed Saleh, Mahmoud Mohamed Ali Mahmoud Edris, Yusuf Sani Abubakar, and Ahmed Mohammed Azab Mousa. “Using Maqasid Shariah to Utilize the Contemporary Waqf: Implementing Artificial Intelligence as an Example.” *Kurdish ...* 12, no. 1 (2024): 2905–23. <https://doi.org/https://doi.org/10.58262/ks.v12i1.208> Using.
- Farag, Wael A., Muhammad Nadeem, and Magedy Helal. “Assessment Transformation in the Age of AI: Moving Beyond the Influence of Generative Tools.” *Proceedings of 2024 1st Edition of the Mediterranean Smart Cities Conference, MSCC 2024*, no. May (2024). <https://doi.org/10.1109/MSCC62288.2024.10697011>.
- Firnando, Hero Gefthi, and Muhammad Wahyudi. “The Role of Artificial Intelligence in Shaping Islamic Finance Services.” *JIEP: Journal of Islamic Economics and Philanthropy* 6, no. 3 (2024): 53–61. <https://ejournal.unida.gontor.ac.id/index.php/JIEP/index>.
- Hakim, Lukman, and Muhamad Risqil Azizi. “Otoritas Fatwa Keagamaan Dalam Konteks Era Kecerdasan Buatan (Artificial Intelligence/Ai).” *Ar-Risalah Media Keislaman Pendidikan Dan Hukum Islam* 21, no. 2 (2023): 164. <https://doi.org/10.69552/ar-risalah.v21i2.2101>.
- Hakim, Sofian Al. “Analytical Framework in Study of Fatwas on Sharia Economics.” *Abkam: Jurnal Ilmu Syariah* 19, no. 2 (2019): 315–30. <https://doi.org/10.15408/ajis.v19i2.12219>.
- Haridan, Nurfarahin Mohd, Azizi Hamizi Nurfarahin, Agung Sriwardhani, Nur Hani Binti Ithanin, and Mohamad Azmi Nias Ahmad. “What Do Shariah Boards Think About Ai?” *Jurnal Bisnis Terapan* 7, no. 2 (2023): 115–27. <https://doi.org/10.24123/jbt.v7i2.6061>.
- Hasan Wahid, Soleh, and Anjar Kususiyanah. “The Relevance of the Usage of Artificial Intelligence and Machine Learning in Legal Analysis (An Analysis of Legal Provisions in the National Sharia Council Fatwa and Financial Services Authority Regulation Using Plagiarism Checker and ATLAS.Ti).” *Proceedings of the 1st International Conference on Research in Social Sciences and Humanities (ICORSH 2020)* 584, no. Icorsh 2020 (2020): 926–36.
- Hassan, Shahir Akram, and Wan Mohd Khairul Firdaus Wan Khairuldin. “Research Design Based on Fatwa Making Process: An Exploratory Study.” *International Journal of Higher Education* 9, no. 6 (2020): 241–46. <https://doi.org/10.5430/ijhe.v9n6p241>.
- Hussain, Mohammad Azam, Mohamad Fateh Labanieh, Nazli Mahdzir, Nooraini Sulaiman, and Omar Saleh Abdullah Bawazir. “The Potential Prospect of Artificial Intelligence (AI) in Arbitration from the International, National and Islamic Perspectives.” *Journal of International Studies* 19, no. 1 (2023): 92–122. <https://doi.org/https://doi.org/10.32890/jis2023.19.1.4>.
- Jamal, M. H. N, and M. Z Zakaria. “Shariah Guideline on Artificial Intelligence (AI) in Fatwa Issuance.” *Salam Digest: Syariah and Law Undergraduate Symposium* 1, no. 1 (2023): 61–70.
- Jharkharia, Sanjay, and Ravi Shankar. “Selection of Logistics Service Provider: An Analytic Network Process (ANP) Approach.” *Omega* 35, no. 3 (2007): 274–89. <https://doi.org/10.1016/j.omega.2005.06.005>.
- Karimullah, Suud Sarim. “The Application of Artificial Intelligence in Islamic Law Discovery.” *Mutawasith* 13, no. 1 (2023): 104–16. <https://doi.org/https://doi.org/10.47971/mjhi.v6i2.748>.
- Khan, Muhammad Faseeh Ullah, Ahmad Saeed, and Abdul Khaliq Angaria. “A Theoretical Comparison of Interest-Free Banking and Interest- Based Banking: A Context of Pakistani Banking Industry.” *Annals of Human and Social Sciences* 3, no. 2 (2022): 664–74. [https://doi.org/http://doi.org/10.35484/ahss.2022\(3-II\)63](https://doi.org/http://doi.org/10.35484/ahss.2022(3-II)63).
- Khoirunisa, Ana, Fathur Rohman, Hilda Aulya Azizah, Devi Ardianti, Arinta Lailatul Maghfiroh, and Aditya Muhammad Noor. “Islam in the Midst of AI (Artificial Intelligence) Struggles: Between Opportunities and Threats.” *Suhuf* 35, no. 1 (2023): 45–52. <https://doi.org/10.23917/suhuf.v35i1.22365>.
- KILINÇ, Ahmet. “OsmanlıDevletiNinIslam HukukunTesiri.” *Yıldırım Beyazıt Hukuk Dergisi* 7, no.

- 2 (2022): 547–80. <https://doi.org/10.33432/ybuhukuk.1090220>.
- Lahsasna, Ahcene. “Fatwa and Its Shariah Methodology in Islamic Finance.” *Journal of Fatwa Management and Research* 2, no. 1 (2011): 133–79. <https://doi.org/https://doi.org/10.33102/jfatwa.vol2no1.121>.
- Lahuri, Setiawan Bin, and Muhammad Rizal Pranoto. “Halal Cosmetics Products Used in Islamic Boarding School Analysis of the Halal Product Standard of Fatwa (MUI).” *AL-FALAH: Journal of Islamic Economics* 7, no. 1 (2022): 1. <https://doi.org/10.29240/alfalah.v7i1.3631>.
- Latifi, Hasan. “Challenges of Using Artificial Intelligence in the Process of Shi’i Ijtihad.” *Religions* 15, no. 5 (2024). <https://doi.org/10.3390/rel15050541>.
- Legendre, Pierre. “Species Associations: The Kendall Coefficient of Concordance Revisited.” *Journal of Agricultural, Biological, and Environmental Statistics* 10, no. 2 (2005): 226–45. <https://doi.org/10.1198/108571105X46642>.
- Leuwol, Ferdinand Salomo, Sam Hermansyah, Abdul Wasik, Husna Amin, and Sitti Nur Alam. “Adaptive Ai Framework for Dynamic Sharia Compliance in Indonesian Islamic Finance: An Ethical and Religiousperspective.” *International Journal of Financial Economics* 1, no. 1 (2024): 8–25.
- Malik, Ridwan, Abdul Malik, and Mega Mustika. “Artificial Intelligence and Islamic Law : Ethical Implications and Fiqh Fatwas in the Digital Age.” *Journal of Family Law and Islamic Court* 3, no. December (2024): 128–43.
- Mashuri, Iffatin Nur, and Muhammad Ngizzul Muttaqin. “Maqāṣid Shari’ah Flexibility to Overcome COVID-19 in Indonesia: From Government Policies to Fatwā of Council of Indonesian Ulema (MUI), Nahdlatul Ulama (NU), and Muhammadiyah.” *De Jure: Jurnal Hukum Dan Syar’iah* 13, no. 2 (2021): 240–63. <https://doi.org/10.18860/j-fsh.v13i2.13280>.
- Mawaddah, Alwi, Najamudin Ali Ustman, Akmal M. Lahada, and Dita. “Artificial Intelligence as a Catalyst for Modernizing Islamic Family Law.” *Al-Mujtabid: Journal of Islamic Family Law* 4, no. 2 (2024): 73–85. <https://doi.org/http://dx.doi.org/10.30984/ajifl.v4i2.3295>.
- Mbaidin, H. “The Role of Ai Integration and Governance Standards: Enhancing Financial Reporting Quality in Islamic Banking.” *Decision Science Letters* 13, no. 1 (2024): 83–98. <https://doi.org/https://doi.org/10.5267/j.dsl.2023.12.001>.
- Mienye, Ibomoiye Domor, Theo G. Swart, and George Obaído. “Recurrent Neural Networks: A Comprehensive Review of Architectures, Variants, and Applications.” *Information* 15, no. 9 (2024): 517. <https://doi.org/10.3390/info15090517>.
- Munshi, Amr Abdullah, Wesam Hasan AlSabban, Abdullah Tarek Farag, Omar Essam Rakha, Ahmad Al Sallab, and Majid Alotaibi. “Automated Islamic Jurisprudential Legal Opinions Generation Using Artificial Intelligence.” *Pertanika Journal of Science and Technology* 30, no. 2 (2022): 1135–56. <https://doi.org/10.47836/pjst.30.2.16>.
- Muthoifin, Arkin Haris, Atikah Umi, and Markhamah Zahra. “Fatwa of the Indonesian Ulama Council Concerning the Prohibition of Smoking and the Implications on Small Traders.” In *Proceedings of the 1st International Seminar on Sharia, Law and Muslim Society (ISSLAMMS 2022)*, 1:57–65. Atlantis Press SARL, 2022. <https://doi.org/10.2991/978-2-494069-81-7>.
- Nguyen, Hien Ngoc, Ganix Lasa, Ion Iriarte, Ariane Atxa, Gorka Unamuno, and Gurutz Galfarsoro. “Datasets of Skills-Rating Questionnaires for Advanced Service Design through Expert Knowledge Elicitation.” *Scientific Data* 9, no. 1 (2022): 1–7. <https://doi.org/10.1038/s41597-022-01421-3>.
- Niam, Mohammad Fattahun. “Does Artificial Intelligence Go beyond the Limits of Religious Authority? An Ethical Review on IslamGPT.” *Al’Adalah: Journal of Islamic Studies* 27, no. 1 (2024): 71–84.
- Ochuba, Nneka Adaobi, Adetumi Adewumi, and David Olanrewaju Olutimehin. “The Role of Ai in Financial Market Development: Enhancing Efficiency and Accessibility in Emerging Economies.” *Finance & Accounting Research Journal* 6, no. 3 (2024): 421–36.

- <https://doi.org/10.51594/farj.v6i3.969>.
- Polat, Ali, Shoaib Khan, and Usman Bashir. "AN INQUIRY INTO THE APPLICATION OF ARTIFICIAL INTELLIGENCE ON FATWA." In *Digital Transformation in Islamic Finance*, edited by Yasushi Suzuki and Mohammad Dulal Miah, Islamic bu., 274–87. New York: Routledge, 2023. <https://doi.org/10.4324/9781003262169>.
- Rahim, Siti Farahiyah Ab, Muhamad Firdaus Ab Rahman, Hussein Azeemi Abdullah Thaidi, Nik Nur Muhammad Alif Bin Nik Mohd Azimi, and Munawar Rizki Jailani. "Artificial Intelligence for Fatwa Issuance: Guidelines and Ethical Considerations." *Journal of Fatwa Management and Research* 30, no. 1 (2025): 77–100. <https://doi.org/https://doi.org.10.33102/jfatwa.vol30no1.654>.
- Rahman, M. E, F Syahriani, and W Jampa. "Islamic Law in Tthe Digital Era: Artificial Intelligence as A Revolutionary Legal Tool in The 21st Century." *Al-Hurriyah: Jurnal Hukum Islam* 9, no. 2 (2024): 102–15. <https://doi.org/http://dx.doi.org/10.30983/al-hurriyah.v9i2.8545>.
- Rosidi, Mohd Harifadilah, Ahmad Wifaq Bin Mokhtarii, and Mohd Nasir Bin Abdul Majid. "Penerimaan Fatwa Dalam Kalangan Masyarakat Muslim Malaysia: Satu Tinjauan Literatur." *Journal of Fatwa Management and Research* 24, no. 1 (2021): 45–62. <https://doi.org/10.33102/jfatwa.vol24no1.335>.
- Sa'ad, Auwal Adam, Sayed Musa Alhabshi, Azman bin Mohd Noor, and Rusni Hassan. "Robo-Advisory for Islamic Financial Institutions: Shari'ah and Regulatory Issues." *European Journal of Islamic Finance*, 2020, 1–9.
- Saaty, Thomas L. *Decision Making with Dependence and Feedback: The Analytic Network Process*. USA: RWS Publications, 1996.
- Saaty, Thomas L, and Luis G Vargas. *Decision Making with The Economic, Political, Social, and Technological Applications with Benefits, Opportunities, Costs, and Risks. Manufacturing Systems*. Vol. 95, 2006.
- . *Decision Making With the Economic, Political, Social and Technological Applications with Benefits, Opportunities, Costs and Risks. Manufacturing Systems*. Vol. 95, 2006. <http://www.amazon.com/dp/0387338594>.
- Salisu, Auwal, Shereeza Mohamad Saniff, and Shahir Akram Hassan. "Sharia Board of Islamic Banks and the Attitude of Fatwa Shopping." *Ekonomika: Jurnal Ekonomi Dan Bisnis Islam* 5, no. 2 (2020): 193–204. <https://doi.org/10.24042/febi.v5i2.7665>.
- Setyowati, Widhy, and Intan Sri Rahayu. "Sector Analysis of Islamic Capital Markets and Artificial Intelligence Functioning as Sharia Advisors." *International Transactions on Artificial Intelligence (ITALIC)* 1, no. 2 (2023): 236–344. <https://doi.org/10.33050/italic.v1i2.334>.
- Shalhoob, Hebah. "The Role of AI in Enhancing Shariah Compliance: Efficiency and Transparency in Islamic Finance." *Journal of Infrastructure, Policy and Development* 9, no. 1 (2025): 1–26. <https://doi.org/https://doi.org/10.24294/jipd11239>.
- Sherstinsky, Alex. "Fundamentals of Recurrent Neural Network (RNN) and Long Short-Term Memory (LSTM) Network." *Physica D: Nonlinear Phenomena* 404, no. March (2020): 1–43. <https://doi.org/10.1016/j.physd.2019.132306>.
- Soumena, Fadly Yashari. "A Critical Review of the Indonesian Council of Ulama (MUI) Fatwa Towards Increasing Sharia Financial Literacy (Systematic Literature Review)." *Journal of Economics Research and Social Sciences* 8, no. 1 (2024): 133–51. <https://doi.org/10.18196/jerss.v8i1.21498>.
- Suhartanto, Dwi, Moch Edman Syarief, Ade Chandra Nugraha, Tintin Suhaeni, Ambia Masthura, and Hanudin Amin. "Millennial Loyalty towards Artificial Intelligence-Enabled Mobile Banking: Evidence from Indonesian Islamic Banks." *Journal of Islamic Marketing* 13, no. 9 (2022): 1958–72. <https://doi.org/10.1108/JIMA-12-2020-0380>.
- Sukindar, Hendrik Kusnianto, Sarikun, Benhard Kurniawan Pasaribu, and Muhd Syahazizamir bin Sahmat. "Legal Innovation in Religious Courts: The Potential Utilization of Artificial

- Intelligence (AI) in Resolving Contemporary Cases.” *MIL.Rev : Metro Islamic Law Review* 3, no. 2 (2024): 388–410. <https://doi.org/10.3176/https://doi.org/10.32332/milrev.v3i2.8199hem.geol.1975.2.10>.
- Svensson, Jonas. “Prayer, Dreams, and Sex: A Showcase of an AI-Augmented Distant Reading of 20 Thousand E-Fatwas.” *CyberOrient* 18, no. 1 (2024): 4–39.
- Syamsuddin, Hatta, M. Mu’Inudinillah Basri, and Moh. Abdul Kholiq Hasan. “Hai’ah As-Syar’iyyah Al-Wathoniyah Wa Dauruha Fi Ar-Riqobah Asy-Syar’iyyah ’Alal Mashorif Al-Islamiyah Fi Indunisiya Wa Manhajuha Fil Fatwa.” Universitas Muhammadiyah Surakarta, 2016.
- Syifa Amin Widigdo, Mohammad, and Homaidi Hamid. “The Power of Fatwā in Indonesia: An Analysis of MUI’s Controversial Fatwās.” *Afkaruna* 14, no. 2 (2018): 146–66. <https://doi.org/10.18196/aiijis.2018.0085.146-165>.
- Tsourlaki, Sofia. “Artificial Intelligence on Sunni Islam’s Fatwa Issuance in Dubai and Egypt.” *Islamic Inquiries* 1, no. 2 (2022): 107–25. <https://doi.org/10.22034/IS.2022.339182.1082>.
- Widiastuti, Tika, Anidah Robani, Puji Sucia Sukmaningrum, Imron Mawardi, Sri Ningsih, Sri Herianingrum, and Muhammad Ubaidillah Al-Mustofa. “Integrating Sustainable Islamic Social Finance: An Analytical Network Process Using the Benefit Opportunity Cost Risk (ANP BOCR) Framework: The Case of Indonesia.” *PLoS ONE* 17, no. 5 May (2022): 1–20. <https://doi.org/10.1371/journal.pone.0269039>.