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Institutionalizing Artificial Intelligence within Indonesia's Zakat Architecture: Navigating Regulatory Challenges and Sharia Compliant Implementation

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Abstract. This study examines how zakat management, supported by artificial intelligence and big data, can be optimized within the context of Islamic finance in Indonesia to address persistent poverty and the gap between zakat potential and actual collection (Purpose). Using a qualitative approach, this research is based on a literature review and case analysis focusing on the application of artificial intelligence, big data analytics, and digital governance mechanisms in zakat management practices in Indonesia's Islamic finance institutions (Methodology). The findings indicate that artificial intelligence and big data enhance zakat management by enabling data-driven decision making, predictive analytics, automated beneficiary verification, and real-time reporting, which improve collection performance, targeting accuracy, operational efficiency, and transparency in Islamic finance–based zakat institutions (Results). From a theoretical perspective, this study contributes to zakat management and Islamic finance literature by integrating artificial intelligence, big data, and sharia compliance into governance, accountability, and ethical decision-making frameworks (Theoretical implication). Practically, the study shows that zakat institutions can leverage artificial intelligence and big data to strengthen public trust and governance in zakat management, while addressing challenges related to regulation, data privacy, cybersecurity, algorithmic bias, implementation costs, and sharia compliance through instruments such as blockchain (Practical implication).

Keywords: Zakat Governance; Artificial Intelligence; Sharia-Compliant; Islamic Finance; Indonesia.

1 Introduction

In March 2024, approximately 25.22 million Indonesians were classified as poor according to the data provided by the Central Bureau of Statistics of the Republic of Indonesia.[1] This situation has been a significant issue to the development of the economy of a country since poverty rates have been high and set back the economic growth of Indonesia to become a developed country. The government and society have engaged in various initiatives aimed at curbing this problem, with one being the optimization of the role of Zakat as a tool of empowering the Muslim community economically.

Zakat is among the five pillars of Islam, which is very important in improving the welfare of society. Zakat has immense potential in Indonesia, where the largest proportion of the population belongs to the Muslim community, because it can help reduce poverty and enhance social cohesion[2]. Indonesia's potential Zakat, according to the Badan Amil Zakat Nasional (BAZNAS) statistics, exceeds hundreds of trillions of rupiah annually; however, the actual collection is much less than that mark figure.[3] This represents the loss between the huge potential of Zakat and the optimization of its assembly and dispersal.

Over the past ten years, the potential of Zakat has become more of a new hope that can bring low-income communities above the poverty threshold. Indonesia has a zakat potential of about IDR 217 trillion in 2016, and the same rose to IDR 286 trillion in 2018. Conversely, Malaysia had a zakat potential of about 5 billion ringgit, or equivalent to IDR 17.5 trillion in 2016. Despite this potential, the realization rates show a significant disparity. Indonesia managed to collect only around IDR 6 trillion, equivalent to roughly 3 percent of its total waqf potential. In contrast, Malaysia succeeded in raising 3 billion ringgit, which represents about 60 percent of its estimated waqf capacity.[4] According to BAZNAS, the zakat potential in Indonesia has the capacity to be IDR 327 trillion when it is handled properly. Today, BAZNAS has collected around IDR 33 trillion so far. Accordingly, the institution targets an increase in zakat collection to IDR 41 trillion in 2024 and aims to reach IDR 50 trillion by 2025[5].

The digitalization of Zakat, infaq, sadaqah, and waqf (ZISWAF) fundraising has now become standard practice in modern philanthropy. Online platforms make it easier for individuals and institutions to donate and manage charitable funds quickly and conveniently. Digital systems also expand public participation, since anyone, from any location, can contribute to charitable programs without being limited by distance or

[1] Data Kemiskinan BPS.

[2] S H A Razak, "Zakat and Waqf as Instruments of Islamic Wealth in Poverty Alleviation and Redistribution," *Int J Sociol Soc Policy [Internet* 3, no. 4):249–66 (n.d.), https://doi.org/10.1108/IJSSP-11-2018-0208.

[3] A P Purwatiningsih and M Yahya, "Why Zakat Collection in Indonesia Is Not as Effective as It Is in Malaysia," *J Islam Financ* 9, no. 1 (n.d.): 100–5.

[4] M Z Awang et al., "Integrating Islamic Social Finance with the United Nations Sustainable Development Goals through Maqasid Al-Shariah Principles [Internet," n.d.

[5] Pengantar Ketua BAZNAS et al., "& Kajian Strategis -Badan Amil Zakat Nasional Gedung Kebangkitan," in *OUTLOOK ZAKAT INDONESIA 2024 Kata Pengantar Direktur Kajian Dan Pengembangan ZIS DSKL: Penyusun: Penyunting: Penerbit*, ed. P Zakat Jl Matraman Raya, n.d.

time.[6] This trend reflects broader changes in religious practices driven by digital technology, which has expanded access to religious knowledge, facilitated personalized religious engagement, and enhanced participation in Islamic economic activities. Digital tools and applications have demonstrated their capacity to improve efficiency and accessibility, including in the management and distribution of Zakat, particularly for communities with limited access to traditional religious institutions.

The transformation of religious practices through digital media has also reshaped patterns of authority, participation, and trust within Muslim communities. Digital platforms foster transparency, interaction, and broader engagement, while enabling new forms of governance that are less dependent on personal relationships and more reliant on system-based trust. In this context, digital governance mechanisms play a crucial role in organizing transactions, automating processes, and enhancing accountability through programmable systems and transparent verification structures.[7] The demands of the Fourth Industrial Revolution further reinforce the urgency of integrating advanced information technologies into zakat management. This technological shift emphasizes automation, connectivity, and data-driven decision-making, fundamentally altering economic behavior and increasing public reliance on digital transactions. As society becomes more digitally oriented, zakat institutions are required to adapt in order to remain effective, credible, and relevant in managing large-scale charitable funds.[8]

There are some challenges and opportunities in the management of Zakat, which are brought by the development of artificial intelligence and big data. AI and big data are two sides of a coin since AI cannot be smarter without big data. Data available across the globe has indicated that the volume of data is doubling annually. The world presently has a population of approximately 7 billion people, with over 5.1 billion people owning mobile phones. As human beings, we already send over 11 billion text messages every day, and more than 2.8 billion individuals are watching YouTube.[9]

Based on the above trouble and chance opportunities that could be presented by the trends of Artificial Intelligence and big data technology in particular, by providing references to the opportunities and challenges that could be provided by big data technology, the researcher is going to discuss the question of how it can be possible to use Artificial Intelligence in order to enhance zakat management efficiencies in Indonesia. On top of this, the barriers to the integration of AI-based zakat management systems in Indonesia will also be observed in this study. It is believed that the findings of the research would be able to inform zakat management, especially in Indonesia.

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[6] Aisyah Indarningsih N et al., "Review of Islamic Social Finance and Entrepreneurship (RISFE," n.d.

[7] H Mumtaha and H Annisa Khoiri, "Analisis Dampak Perkembangan Revolusi Industri 4.0 Dan Society 5.0 Pada Perilaku Masyarakat Ekonomi (E-Commerce). J PILAR Teknol J Ilm Ilmu Ilmu Tek," n.d.

[8] L Ellitan, "Competing in the Era of Industrial Revolution 4.0 and Society 5.0," *J Maksipreneur Manajemen, Koperasi, Dan Entrep* 1;10(1):1 (n.d.).

[9] F Nugraha et al., "Artificial Intelligence Usage in Zakat Optimization," n.d.

2 Research Method

The qualitative method was used for this research. Qualitative methodology is a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior.[10] This study uses a descriptive approach. The researcher gathers relevant data to address and explain the research questions.

The study adopts a qualitative method that relies on literature reviews and case studies to analyze how digital technology and AI are applied in zakat management. The main data comes from literature reviews on zakat administration and the role of AI in Islamic economics, while secondary data comprises institutional reports, Indonesian regulatory frameworks, and prior studies on digital zakat initiatives. Through qualitative analysis, the data is interpreted to elucidate how AI facilitates the development of digital-based zakat systems.

The researcher used a constructivist paradigm. Richard West explains that the constructivist view sees truth as subjective, shaped by the experiences and interpretations of the participants, where there is at least one researcher and the rest are the participants. According to the constructivist paradigm, objectivity is impossible in the physical world, but only through the thoughts of people.[11]

3 Literature Review

Artificial Intelligence (AI) is also more crucial in enhancing the system of zakat management. All these technologies are incorporated in the processes of zakat collection and distribution and improve efficiency, transparency, and accountability. Although technology has been identified as a significant contributor to the growth in the volume of Zakat, other factors, including trust, credibility, and transparency, are also crucial in maintaining an efficient system.

Beyond the use of information technology, new frameworks like the integration between islamic social welfare and fintech have been introduced to assess the performance and efficiency of zakat institutions. These models not only make the collection process easier but also strengthen transparency and improve the effectiveness of zakat distribution. With further development of these technologies, they provide a more vibrant means of the traditional Zakat systems, which usually suffer due to inefficiencies and a lack of transparency. The combination of Islamic social welfare and fintech allows Zakat institutions to implement more sophisticated approaches to the management of funds, identification of recipients, and their effective distribution to enhance their efficiency in operations.

The use of Artificial Intelligence, especially in big data analytics, can help advance the allocation and management of Zakat. The use of AI-based solutions has a number of benefits, such as improved efficiency, transparency, and the ability to identify recipients.[12] These devices enable institutions to handle a massive amount of

[10] Lexy J Moloeng, *Metode Penelitian Kualitatif*, 8th ed. (Bandung: Remaja Rosdakarya, n.d.).

[11] Hari Sutra Disemadi, "Lensa Penelitian Hukum : Esai Deskriptif Tentang Metodologi Penelitian Hukum," *J Judic Rev [Internet* 24, no. 2 (n.d.): 289–304.

[12] K Laylo, "The Impact of AI and Information Technologies on Islamic Charity (Zakat): Modern Solutions for Efficient Distribution," *Int J Law Policy [Internet* 1 (n.d.), https://doi.org/10.59022/ijlp.83.

unstructured data. Sulaiman introduced a big data maturity model to measure how prepared zakat institutions are in managing large volumes of data to strengthen transparency and support better decision-making. AI plays a crucial role by organizing, cleaning, and processing zakat-related information. Several FinTech frameworks have also been developed using AI and Natural Language Processing (NLP), and they are directed at poverty reduction and financial inclusion.[13] In order to support data-driven methods in the administration of Zakat, four important data types are outlined, namely, identification, quantitative, descriptive, and qualitative data.[14]

By enabling AI systems to combine these types of data, it will be possible to distribute Zakat more accurately and efficiently, which will benefit recipients and donors. AI also contributes to predictive analytics, enabling institutions to anticipate trends in zakat collection and distribution.[15] As an illustration, the Discrete Malthusian Growth Model is useful in the prediction of the patterns of zakat collection, and it helps in the planning of future resource allocation. By adopting AI-based forecasting tools, zakat institutions can optimize their workflows and ensure that funds are directed to areas with the greatest need.[16]

Amri and Rizal find Zakat as a strategic fiscal instrument for poverty alleviation and sustainable development, empirically demonstrating that Zakat contributes to income redistribution and supports the achievement of SDGs[17] particularly poverty reduction and social welfare targets.[18] However, both studies identify persistent institutional constraints, including weak legal infrastructure, outdated collection mechanisms, and fragmented governance. These limitations prevent Zakat from functioning as an effective public finance instrument. What remains insufficiently explored is how constitutional values such as legal certainty, accountability, and social justice can be structurally integrated with Islamic fiscal principles to enhance Zakat's systemic impact.

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[13] Wahab A Mukhlishin, Setiaji B, and Tazhdinov M, "Zakat Maal Management and Regulation Practices: Evidence from Malaysia, Turkey, and Indonesia," *J Hum Rights, Cult Leg Syst* 4, no. 2 (n.d.): 569–92.

[14] M N Paizin, "Big Data Analytics for Zakat Administration: A Proposed Method," n.d., https://doi.org/10.21043/ziswaf.v8i2.11382.

[15] S T Maretaniandini and F Hilmiyah, "Implementation of Advanced Technology in Waqf Management: A Systematic Literature Review," *J Islam ... [Internet*, n.d.

[16] Fui-Hoon Nah F et al., "Generative AI and ChatGPT: Applications, Challenges, and AI-Human Collaboration," *Journal of Information Technology Case and Application Research. Routledge* 25 (n.d.): 277–304.

[17] El Amri et al., "Fintech Adoption and Its Investment Impact in Islamic Social Finance: The Case of Zakat," *QIJIS (Qudus International Journal of Islamic Studies* 12 (n.d.): 213–254 10 21043 12 2 17069.

[18] Rizal Rizal, Ruslan Ghofur, and Pertiwi Utami, "The Role of Muslim Generation Community at Zakat Collection on Realizing Sustainable Development Goals (SDGs," in *Era of Digital Society 5.0. JURIS (Jurnal Ilmiah Syariah*, vol. 22. 105, n.d., 10 31958 22 1 6562.

A second body of research examines productive zakat and al-Qarḍ al-Ḥasan initiatives as tools for economic empowerment.[19], Al-Banna and Nurdany,[20] Hanifuddin,[21] and Adnan[22] Conclude that these models shift Zakat from consumptive charity toward sustainable livelihood development, aligning with maqāṣid al-sharīʿah objectives of justice and economic independence. Nevertheless, these studies operate largely at the programmatic level. They do not sufficiently address how such initiatives can be embedded within national regulatory frameworks through siyāsah māliyah to ensure scalability, legal enforceability, and policy coherence.

Theoretical scholarship on siyāsah māliyah provides a normative framework for Islamic public finance governance. Sumiati,[23] emphasize principles such as maṣlaḥah, istihsān, and preventive policy as legitimizing state intervention in zakat administration. While these works establish strong doctrinal foundations, they remain largely abstract. There is limited engagement with how these principles can be operationalized within constitutional democracies that require administrative accountability, transparency, and judicial oversight.

From a constitutional law perspective, studies on Indonesia's zakat regime focus on Law No. 23 of 2011. Hamzah[24] and Ahyani[25] Conclude that the Indonesian state plays a dual role as regulator and executor of Zakat, justified by constitutional commitments to religious freedom and social welfare. However, these studies do not adequately theorize how Islamic governance concepts, particularly siyāsah māliyah, can mediate tensions between religious norms and constitutional mandates. As a result, Zakat remains analytically fragmented between public administration and religious obligation.

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[19] A Dakhoir, "Al-Qardawi's Thought on Zakat of Stocks in a Modern Industry: An Experience of Indonesia," *Al-Manahij: Jurnal Kajian Hukum Islam* 13 (n.d.): 159–168.

[20] H Al-Banna and A Nurdany, "Sustainability of Islamic Rural Banks: A Social Qardh Financing Approach," *Global Review of Islamic Economics and Business* 9, no. 2 (n.d.), https://doi.org/10.14421/grieb.2021.092-08.

[21] I Hanifuddin, N Kasanah, and E Eficandra, "Al-Qarḍ Al-Ḥasan Program of Bankziska: Zakat Fund-Based Empowerment Model for Victims of Loan Sharks," *Juris* 23, no. 1 (n.d.): 1–12, https://doi.org/10.31958/juris.v23i1.10799.

[22] Abu Yazid Adnan Quthny, "Implementasi Maslahah Mursalah Sebagai Alternatif Hukum Islam Dan Solusi Problematika Umat," *Asy-Syari'ah : Jurnal Hukum Islam* 5, no. 1 (2019): 1–19, https://doi.org/10.36835/assyariah.v5i1.110.

[23] S Sumiati et al., "Penelusuran Prinsip Prinsipekonomi Syariah Tentang Jaminan Dalam Peraturan Perundang Undangan Di Indonesia," *Asy Syari'ah* 26, no. 2 (n.d.): 183–203, https://doi.org/10.15575/as.v26i2.37523.

[24] H Harun and M M Hamzah, "The Factors Associated with Zakat Compliance in Selected Countries: A Systematic Literature Review," *Petita* 9, no. 2 (n.d.): 718–741, https://doi.org/10.22373/petita.v9i2.486.

[25] H Ahyani et al., "Building Progressive Islamic Law in Zakat Distribution to Support Sustainable Development Goals: A Maqasid Sharia Perspective in Indonesia," *Journal of Lifestyle and SDGs Review* 5, no. 2 (n.d.): 4071, https://doi.org/10.47172/2965-730X.SDGsReview.v5.n02.pe04071.

Comparative literature on Malaysia highlights similar governance challenges. Adinugroho[26] Observe that decentralized zakat administration through Majlis Agama Islam Negeri strengthens local autonomy but undermines policy coherence and accountability. Although Islam holds constitutional status, inconsistencies in enforcement weaken legal certainty. Jurisprudential studies by Masrawan[27] and Syahbandir[28] Stress the importance of ijtihād in adapting zakat regulation to contemporary realities. Yet, they do not sufficiently examine how ijtihād can be institutionally aligned with constitutional governance structures.

An emerging interdisciplinary strand explores the integration of Zakat and waqf with Artificial Intelligence, blockchain, and telemedicine. Zahid's study demonstrates that AI-enabled Islamic social finance can mobilize approximately USD 240 million annually, reduce medical errors by 15 percent, and increase rural healthcare access by 35 percent. These findings confirm that Shariah-based finance is compatible with advanced technology. However, the study also warns of elite dominance and cybersecurity risks in the absence of inclusive governance. The constitutional implications of delegating welfare distribution to algorithmic systems remain largely unexplored.[29]

Global studies on AI-driven philanthropy and healthcare modernization further support these findings. Elamin shows that AI improves early outbreak detection, resource allocation, and humanitarian response efficiency. Nevertheless, the study highlights serious risks of algorithmic bias and data privacy violations affecting marginalized communities. While the author calls for integrating Islamic ethical values such as rahmah and social justice into AI design, the absence of legally enforceable standards grounded in constitutional rights remains a critical gap.[30]

Hybrid zakat-waqf financing models constitute another important strand. Ahmad's study on Selangor concludes that combining zakat liquidity with productive waqf assets creates sustainable financing for healthcare services and generates long-term social returns.[31] AbdulKareem and Al-Daihani similarly find that Zakat provides rapid-response relief, while waqf supports long-term resilience during crises. Despite their effectiveness, these studies emphasize that success depends on transparent asset

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[26] "Analysis of Zakat Management Efficiency Levels in Two ASEAN Countries (Studies in Indonesia and Malaysia," *Revista de Gestão Social e Ambiental* 18, no. 5 (n.d.): 5033, https://doi.org/10.24857/rgsa.v18n5-044.

[27] M Masrawan et al., "Legal Conflict in Zakat Management in the Prismatic Communities of Kapuas Regency, Central Kalimantan," *Al-'Adalah* 19, no. 1 (n.d.): 179–194, https://doi.org/10.24042/adalah.v19i1.12466.

[28] M Syahbandir et al., "State Authority for Management of Zakat, Infaq, and Sadaqah as Locally-Generated Revenue: A Case Study at Baitul Mal in Aceh," *AlIhkam* 17, no. 2 (n.d.), https://doi.org/10.19105/al-lhkam.v17i2.7229.

[29] Z Zahid et al., "Digital Health Transformation through Ethical and Islamic Finance: A Sustainable Model for Healthcare in Bangladesh," *International Journal of Multidisciplinary and Innovative Research* 2, no. 3 (n.d.): 1–12, https://doi.org/10.58806/ijmir.2025.v2-i3-03.

[30] Muchammad Zamzami Elamin et al., "Analysis of Waste Management in The Village of Disanah, District of Sreseh Sampang, Madura," *Jurnal Kesehatan Lingkungan* 10, no. 4 (2018): 368, https://doi.org/10.20473/jkl.v10i4.2018.368-375.

[31] G Ahmad et al., "Developing the Hybrid Model (Waqf & Zakat) for Improving the Zakat Recipients' Healthcare in Selangor," *Journal of Islamic Finance* 10 (n.d.): 52–64, https://doi.org/10.31436/jif.v10i.528.

governance and strong public policy support. They do not sufficiently explore how constitutional fiscal principles and siyāsah māliyah can jointly regulate hybrid instruments.[32]

Legal studies on AI adoption in developing countries, such as Zuhair's work, identify weak regulatory frameworks, high costs, and low institutional readiness as barriers to equitable AI deployment. These studies caution that poorly regulated AI may reinforce inequality. However, they treat regulation primarily as a technical issue and neglect the role of Islamic fiscal ethics and constitutional welfare obligations in shaping justice-oriented legal frameworks.[33]

Finally, studies on digitalization and global health governance reinforce the need for ethical oversight. Judijanto[34] Find that blockchain and digital platforms improve transparency and donor engagement, but exacerbate digital divides. Schwalbe and Wahl[35] Confirm that predictive AI enhances healthcare efficiency but depends on inclusive data. Ethical analyses by Goktas and Grzybowski,[36] Advocate "Ethics by Design". However, these studies rarely engage with Islamic social finance or constitutional welfare models.

4 Result and Discussion

4.1 Context-Specific Zakat Governance in Indonesia

Indonesia’s zakat governance architecture is legally anchored in Law No. 23 of 2011 on Zakat Management and operationally reinforced by Government Regulation No. 14 of 2014, which together mandate an integrated, transparent, and accountable national zakat system. At the core of this framework stands the National Zakat Board (BAZNAS), established as an independent non-structural state body responsible to the President through the Minister of Religious Affairs. BAZNAS functions not merely as a collecting institution but as the national coordinator of zakat management, exercising hierarchical authority from the central level down to provincial and district or municipal BAZNAS offices. This structure assigns BAZNAS comprehensive responsibilities across planning, collection, distribution, and utilization of Zakat at the national scale. Alongside state-based institutions, the law formally incorporates community

[32] I A AbdulKareem et al., “Mitigating the Effect of COVID-19 on Society through Islamic Social Finance,” *Journal of Management Theory and Practice* 2, no. 1 (n.d.): 57–61, https://doi.org/10.37231/jmtp.2021.2.1.83.

[33] V Zuhair et al., “Exploring the Impact of Artificial Intelligence on Global Health and Enhancing Healthcare in Developing Nations,” *Journal of Primary Care & Community Health* 15 (n.d.), https://doi.org/10.1177/21501319241245847.

[34] L Judijanto, N Ladjin, and S Novitasari, “Effectiveness of Productive Waqf Management in Improving the Welfare of the Poor: A Bibliometric Review,” *West Science Social and Humanities Studies* 2, no. 10 (n.d.): 1334, https://doi.org/10.58812/wsshs.v2i10.1334.

[35] N Schwalbe and B Wahl, “Artificial Intelligence and the Future of Global Health,” *The Lancet* 395, no. 10236 (n.d.): 1579–1586, https://doi.org/10.1016/S0140-6736(20)30226-9.

[36] P Goktas and A Grzybowski, “Shaping the Future of Healthcare: Ethical Clinical Challenges and Pathways to Trustworthy AI,” *Journal of Clinical Medicine* 14, no. 5 (n.d.), https://doi.org/10.3390/jcm14051605.

participation through Licensed Zakat Institutions (LAZ), while redefining their position as auxiliary actors that support BAZNAS rather than operate independently. LAZ is required to obtain ministerial authorization, demonstrate nonprofit legal status, maintain Sharia supervisory boards, and secure technical recommendations from BAZNAS before commencing operations. At the micro-operational level, the architecture is further extended through Zakat Collection Units (UPZ) formed within government agencies, state-owned enterprises, private institutions, and sub-district administrations to widen muzaki outreach.[37] This institutional configuration reflects a deliberate policy choice to centralize coordination while maintaining pluralistic operational channels, thereby creating a governance environment where accountability, standardization, and hierarchical oversight become defining characteristics of Indonesian zakat management.[38]

Within this centralized yet multi-actor system, accountability is institutionalized through layered reporting and audit obligations that bind all zakat operators. LAZ is legally required to submit periodic reports on zakat collection, distribution, and utilization to BAZNAS and relevant local governments, while BAZNAS itself must report national zakat management outcomes to the Minister of Religious Affairs and publicly disclose its annual balance sheet. These obligations are reinforced by mandatory financial and Sharia audits designed to ensure that zakat funds are managed in accordance with both statutory requirements and Islamic legal principles. Importantly, Indonesia has already translated these accountability requirements into a digital governance infrastructure through the Zakat Management Information System (SIMBA), operated by BAZNAS as a national administrative backbone.[39] SIMBA standardizes reporting formats, enables real-time data updating, and integrates information flows across zakat institutions nationwide. Empirical studies on SIMBA demonstrate that its deployment has improved reporting timeliness, reduced administrative duplication, and enhanced institutional transparency. From a governance perspective, SIMBA represents a critical institutional asset because it operationalizes legal accountability into a functioning digital system rather than leaving it as a purely normative mandate. This existing digital foundation is essential for contextualizing any discussion of artificial intelligence in Indonesian zakat management, as it defines the concrete administrative environment into which AI technologies may be introduced.[40]

4.2 The Efficiency Gains From Artificial Intelligence Adoption In Zakat Governance

In a recent zakat-focused review and model paper, efficiency is linked to replacing manual workflows with integrated digital platforms that accelerate transactions and

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[37] *Undang-Undang Nomor 23 Tahun 2011 Tentang Pengelolaan Zakat* (di Republik Indonesia, n.d.).

[38] Viskha Purwita Lana et al., "Urgensi Kelengkapan Teknis Dalam Regulasi Penggunaan Konten YouTube Sebagai Jaminan," *Padjadjaran Law Review* 10, no. 2 (2022), https://doi.org/10.56895/plr.v10i2.1035.

[39] BAZNAS et al., "& Kajian Strategis -Badan Amil Zakat Nasional Gedung Kebangkitan."

[40] R Damaris, S D Rosadi, and I M D Bratadana, "DATA GOVERNANCE FOR ARTIFICIAL INTELLIGENCE IMPLEMENTATION IN THE FINANCIAL SECTOR: AN INDONESIAN PERSPECTIVE," *Journal of Central Banking Law and Institutions* 4, no. 3 (n.d.): 445–472, https://doi.org/10.21098/jcli.v4i3.430.

enable real-time monitoring, while automation of repetitive tasks such as beneficiary verification, record-keeping, and reporting is described as reducing administrative inefficiencies and operational costs, freeing resources for program delivery and allowing more timely assistance to mustahik.[41]

A second stream of Zakat and Islamic social finance literature specifies efficiency gains in terms of distribution timeliness and auditability once AI analytics are integrated with digital governance infrastructure. One case-based account describes a fully integrated system combining AI analytics with blockchain validation and Sharia-compliant smart contracts in ZISWAF institutions, reporting a substantial reduction in fund distribution delays and enabling near real-time auditing and reporting. Within an efficiency mechanism analysis, this is typically interpreted through time-based indicators such as time-to-disbursement (average days from collection to delivery), queue time for approvals, and monitoring latency, because real-time or near real-time reporting reduces information delays that otherwise slow operational decisions and corrective actions.[42]

A third efficiency mechanism is leakage control on the collection side, where leakage is treated as the gap created by under-reporting and the resources spent on detecting and correcting it. A zakat-specific machine learning study models under-reporting detection in zakat payer declarations and explicitly links efficiency to improving detection accuracy while prioritizing audits based on "revenue at risk," which functions as a performance metric for allocating limited audit capacity. In efficiency terms, the mechanism is that AI helps concentrate compliance work on cases with the highest expected recovery, reducing the cost per recovered unit of Zakat and improving the effectiveness of enforcement effort, which can be tracked through indicators such as the under-reporting gap, recovered revenue-at-risk, and audit yield per case reviewed.[43]

4.3 AI in Real-Time Reporting and Automated Verification of Zakat Transactions

AI technologies enable automated verification processes and real-time reporting, which significantly strengthen the overall management of Zakat funds. This discussion focuses on three main aspects. The use of AI to automate verification procedures. The implementation of real-time reporting systems. The key challenges and ethical issues related to the adoption of AI in Zakat management.[44]

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[41] Hasan Syahrizal, "Implementation of Artificial Intelligence in Zakat Management: A Predictive Management Model for Empowering Mustahik in Digitally Disadvantaged Cities," *IQRAR: Jurnal Akuntansi, Manajemen & Ekonomi Syariah* 1, no. 1 (n.d.): 31–39, https://doi.org/10.61104/iqrar.v1i1.2184.

[42] D F Mukaromah, A Rahim, and H A Khafidz, "Leveraging Artificial Intelligence for Efficient and Transparent ZISWAF Management: Comparative Insights from Indonesia and Malaysia," *Munakahat* 1, no. 2 (n.d.): 27–39.

[43] M M Ben Ismail and N AlSadhan, "Simultaneous Classification and Regression for Zakat Under-Reporting Detection," *Applied Sciences* 13, no. 9 (n.d.): 5244, https://doi.org/10.3390/app13095244.

[44] S Rizal and M Pakkanna, "Digitalization of Zakat in Stimulating Community Socioeconomic Development in the Middle of the Covid-19 Pandemic (Maqashid Syariah Perspective," *Eur J Humanit Soc Sci* 18;3(1):23–33 (n.d.).

AI technologies, particularly machine learning algorithms, have transformed the verification of Zakat transactions. These systems can process large datasets to detect patterns and anomalies, ensuring compliance with Zakat regulations. For example, AI can match donor data with recipient eligibility criteria, thereby reducing errors and preventing fraud. Automation makes the verification process faster and more accurate, ensuring that Zakat funds reach the rightful beneficiaries. This use of AI aligns with Islamic finance principles that emphasize justice and efficiency in financial transactions.[45]

The implementation of AI eases the creation of real-time reporting systems in zakat management. These systems give real-time information on the collection and distribution of Zakat, which improves transparency and accountability. The contributors are also able to track their funds that have been given, and this makes them trust the zakat institutions. Furthermore, real-time data helps the zakat administrator to make wise choices in order to allocate resources to the needy areas. Such a dynamic reporting system will ensure the effective use of zakat funds, which will address socioeconomic differences over time.[46] In spite of the advantages, there are a number of issues in applying AI to zakat management. Data privacy is one of the major worries; the accumulation and manufacture of personal data requires high-security measures to avoid its breach. Also, AI systems are expensive to use in terms of financial resources and technical skills, and certain Zakat organizations might not possess them.

Another problem is that AI algorithms should be based on Islamic ethical principles, and technologists and Islamic scholars should also work together. These challenges are important in ensuring the effective adoption of AI in managing Zakat.[47] Finally, the adoption of AI for automated verification and real-time reporting has the potential to reshape Zakat management. Despite its clear benefits, careful attention must be given to existing challenges to ensure that AI implementation remains aligned with the ethical standards and operational frameworks of zakat institutions.

4.4 Issues and Obstacles in Adopting AI for Zakat Governance

Digital transformation within the Zakat, infaq, shodaqoh, and waqf (ZISWAF) ecosystem has shifted from a mere discourse into an urgent necessity. In Indonesia, there is a striking gap between the potential for Zakat, which reaches Rp327.6 trillion, and the actual collection realization, which has only touched Rp10.2 trillion.[48] Artificial Intelligence (AI) has emerged as a promising solution to close this gap through optimized collection, accurate beneficiary (mustahik) prediction, and

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[45] A Hemmet, "Harmonizing Artificial Intelligence with Islamic Values - A Thoughtful Analysis of Religious, Social, and Economic Impacts of Technological Advancements," *Am J Smart Technol Solut* 4;2(2):65–76 (n.d.).

[46] I Hamadou and U Suleman, "FinTech and Islamic Finance: Opportunities and Challenges," in *The Future of Islamic Finance [Internet*, ed. E Smolo and M M Raheem (Emerald Publishing Limited, n.d.), 175–88, https://doi.org/10.1108/978-1-83549-906-120241011.

[47] B S Nugroho and D T Prastyo, "Personal Data Protection in the Development of Digital Society (A Maqashid Syariah Perspectives," in *Proceedings of International Postgraduate Conference on Interdisciplinary Islamic Studies*, vol. 2, n.d., 130–143.

[48] Dhany Hermawan and Atep Hendang Waluya, "Peran ZISWAF Dalam Pemberdayaan Masyarakat Miskin Di Provinsi Banten (Studi Kasus Program Hibah Rumah Siap Huni Koperasi Syariah Benteng Mikro Indonesia)," *Jurnal Ekonomi Islam Al-Infaq* 10, no. 1 (2019): 1–12.

distribution transparency. However, the adoption of AI in this sector is not instantaneous and faces a complex labyrinth of obstacles.[49]

The most fundamental issue in adopting AI for Zakat is the unreadiness of the legal framework. As stated in the initial text, the use of AI in both international and domestic zakat procedures is hindered by the absence of adequate governance in Indonesia.[50] The main challenge lies in "Velocity," or the speed of technological evolution that far exceeds the regulators' ability to update laws.[51] Current regulations are still based on rigid industrial-era assumptions, making them struggle to handle the unique characteristics of AI.

The debate over this regulation involves contradictory views: figures like Eric Schmidt suggest self-regulation by companies, yet the history of social media shows that this approach risks triggering privacy violations and monopolies. Conversely, tech leaders like Sam Altman (OpenAI) and Sundar Pichai (Google) urge the creation of a specialized regulatory body. In Indonesia, legal fragmentation and the absence of comprehensive AI legislation create uncertainty regarding legal personhood and who is legally responsible if an algorithm makes a mistake in distributing zakat funds.[52]

AI is highly dependent on Big Data. A document by Damaris emphasizes that the biggest challenge in Indonesia's financial sector is suboptimal data governance. The security of muzakki (donor) personal data and sensitive mustahik data is a crucial point. Without strong data protection, AI adoption could actually trigger information leaks that damage public trust. Furthermore, there is a technical barrier in the form of the "Digital Divide." Case studies in areas such as Nabire, Central Papua, show that uneven technological infrastructure hinders the universal implementation of AI predictive management models.[53] Other technical issues include the risk of algorithmic bias, where AI systems might unintentionally discriminate against certain groups in determining beneficiary eligibility if the input data is not representative.[54]

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[49] Tristam Pascal Moeliono and Koerniatmanto Soetoprawiro, "Pengembangan Dan Perkembangan Pemikiran Hukum Pertanian Di Indonesia," *Undang: Jurnal Hukum* 3, no. 2 (2020): 409–40, https://doi.org/10.22437/ujh.3.2.409-440.

[50] Karshiboyeva Laylo, "The Impact of AI and Information Technologies on Islamic Charity (Zakat): Modern Solutions for Efficient Distribution," *International Journal of Law and Policy* 10, no. 59022/ijlp (n.d.).

[51] F Ridzuan, "Artificial Intelligence in Zakat Management: Opportunities and Challenges," in *Integrating Artificial Intelligence, Security for Environmental and Business Sustainability . Studies in Systems, Decision and Control*, ed. A Hamdan, vol. 598 (Cham: Springer, n.d.), https://doi.org/10.1007/978-3-031-91424-9_8.

[52] O K Loang, "Analysis of Artificial Intelligence in Financial Regulation in Malaysia, Indonesia, and the United States," *Journal of Central Banking Law and Institutions* 4, no. 3 (n.d.): 473–504, https://doi.org/10.21098/jcli.v4i3.417.

[53] R Damaris, S D Rosadi, and I M D Bratadana, "Data Governance for Artificial Intelligence Implementation in the Financial Sector: An Indonesian Perspective," *Journal of Central Banking Law and Institutions* 4, no. 3 (n.d.): 445–472, https://doi.org/10.21098/jcli.v4i3.430.

[54] Rizal and Pakkanna, "Digitalization of Zakat in Stimulating Community Socioeconomic Development in the Middle of the Covid-19 Pandemic (Maqashid Syariah Perspective."

The human factor remains the determinant of technological success. Currently, the level of Sharia financial literacy in Indonesia stands at only 39.11%.[55] This low literacy is directly proportional to the low understanding among zakat administrators (*amil*) regarding high-level technology. There is a scarcity of human resources with hybrid expertise: those who understand zakat jurisprudence (*fiqh*) deeply while also mastering data science. Without competent HR, AI technology will only become an expensive, unused tool or, even worse, be misused.[56]

From an economic perspective, AI integration requires significant fiscal investment. The costs of developing IT infrastructure, maintaining cybersecurity systems, and procuring licensed software are heavy burdens for many Zakat Management Organizations (LAZ).[57] Meanwhile, inefficiency in traditional operational management remains high, causing funds for innovation to often be sidelined in favor of short-term aid distribution needs.[58] Institutionally, the lack of integrated coordination between BAZNAS and various LAZs to unify a national database causes AI to work in isolated data silos, which reduces the accuracy of its predictions.[59]

Last but not least is the cultural barrier. Indonesian society has a legal culture that strongly emphasizes moral harmony and human-centric collective responsibility.[60] Shifting decision-making authority from human amils to machines is often perceived as stripping away the spiritual and human elements of zakat worship. Organizational resistance to this change is exacerbated by low public trust in digital platforms compared to direct face-to-face interactions. Additionally, AI technology must be aligned with the principles of Maqasid al-Sharia to ensure that the efficiency pursued does not violate the social justice that is the essence of Islamic economics.[61]

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[55] Eva Yunita Sari, Hartono Hartono, and Rini Armin, "Analisis Strategi Pemasaran Pada UMKM Nawasena Dalam Meningkatkan Minat Beli Konsumen," *Lokawati : Jurnal Penelitian Manajemen Dan Inovasi Riset* 1, no. 5 (2023): 171–80, https://doi.org/10.61132/lokawati.v1i5.147.

[56] S Pulungan et al., "The Digital Innovation in Zakat Collection and Distribution: Opportunities and Challenges," in *Indonesian Conference of Zakat - Proceedings*, n.d., 423–432.

[57] D F Mukaromah, A Rahim, and H A Khafidz, "Leveraging Artificial Intelligence for Efficient and Transparent ZISWAF Management," *Comparative Insights from Indonesia and Malaysia* 1, no. 2 (n.d.): 27–40.

[58] Y Takanashi, "Future of Finance," n.d., https://doi.org/10.1007/978-3-030-544553-18.

[59] A Zuliansyah, D Pratomo, and O Supriyaningsih, "The Role of Financial Technology (Fintech) in ZIS Management to Overcome Poverty," *Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE* 5 (n.d.): 203–224, https://doi.org/10.31538/iijse.v5i1.1794.

[60] Ayu Suci Rianingsih Hairiyah, "Strategi Pondok Pesantren Dalam Menghadapi Tantangan Globalisasi (Studi Kasus Di Pondok Pesantren Api Asri Tegalrejo Magelang)," *Transformasi : Jurnal Kepemimpinan & Pendidikan Islam* 3, no. 2 (2020): 10–26, https://doi.org/10.47945/transformasi.v3i2.335.

[61] R Hartono, A Ikrom, and A Mardhatillah, "Prinsip Hukum Fiqih Muamalah Dalam Transaksi Ekonomi Kontemporer: Analisis Normatif Dan Aplikatif," *Jurnal Budi Pekerti*, n.d.

Table 1. Obstacles in Adopting AI for Zakat Management

Category	Specific Issues & Obstacles	Key Impact
Legal & Regulatory	AI evolves faster than the industrial-age legal framework. Lack of specific governance for AI in the ZISWAF sector. Uncertainty regarding "Legal Personhood" (who is liable for AI errors?).	Creates legal uncertainty for institutions and hinders international/domestic zakat procedures.
Technical	*Digital Divide*: Uneven infrastructure in remote areas (e.g., Nabire). Risk of discrimination against specific groups if training data is unrepresentative. Vulnerability of sensitive muzakki and mustahik data to cyber threats.	Risks include systemic exclusion of vulnerable populations and potential loss of data privacy.
Human Resources	Sharia financial literacy is low (39.11%). Lack of "hybrid" professionals (experts in both Fiqh Zakat and Data Science). Fear among amils that AI will replace human spiritual touch.	Technology becomes an "expensive, unused tool" or is mismanaged due to a lack of competence.
Institutional	Lack of coordination/integrated database between BAZNAS and various LAZs. Suboptimal data governance in Indonesia's financial sector.	Reduces the accuracy of AI predictive models and slows down national-scale implementation.
Fiscal & Economic	Expensive infrastructure, software licensing, and cybersecurity maintenance. Low actual collection (~3% of potential) limits funds available for innovation.	Smaller institutions (LAZ) struggle to afford AI, widening the gap between large and small agencies.
Cultural & Ethical	*Moral Harmony*: Conflict between cold machine logic and human-centric religious values. Difficulty ensuring efficiency doesn't violate social justice. Public preference for face-to-face interaction over digital platforms.	Organizational and public resistance to shifting decision-making from humans to machines.

4.5 Ethical Implications of AI Adoption in Zakat Governance

The rapid expansion of artificial intelligence across financial and social sectors has begun to reshape the institutional landscape of zakat management. Zakat institutions increasingly rely on algorithmic systems to support assessment, collection, and distribution processes, driven by the promise of operational efficiency, scalability, and

data-driven precision. However, the integration of AI into zakat governance raises fundamental ethical questions that extend beyond technical performance. As Zakat embodies both an economic mechanism and a form of religious devotion, its digital transformation must be evaluated through an ethical lens grounded in Islamic moral philosophy.[62]

A central ethical issue concerns the growing dependence on personal data within AI-based zakat systems. Digital platforms collect and process extensive information related to donors and beneficiaries, including financial status, family composition, health conditions, and consumption patterns. In Islamic ethical thought, the protection of personal privacy represents a core moral value rather than a secondary legal concern.[63] Qur'anic teachings emphasize respect for personal boundaries and the inviolability of private life, establishing a moral framework that obliges institutions to avoid intrusion and exploitation. In the context of AI-driven zakat management, personal data effectively constitutes a form of digital sanctity that must be safeguarded against misuse and unauthorized access.[64]

Closely related to privacy is the Islamic concept of *amanah*, which frames ethical responsibility in terms of trust and accountability. When zakat institutions assume control over personal data, they do so as trustees rather than owners. This trust-based relationship imposes ethical limits on how data may be collected, analyzed, and applied within AI systems. The misuse of data, whether for institutional gain or administrative convenience, undermines the moral legitimacy of zakat governance. Therefore, ethical AI adoption requires governance structures that ensure transparency, limit data usage to legitimate objectives, and protect vulnerable populations from digital harm.[65]

Another critical ethical dimension emerges from the increasing reliance on AI-assisted decision-making in zakat governance. Algorithms are used to classify beneficiaries, predict eligibility, and optimize allocation strategies. While these tools offer practical advantages, they also raise concerns about justice and fairness. AI systems operate on historical data and predefined criteria, which may reflect existing biases or structural inequalities. If left unchecked, such biases can lead to exclusion errors or misallocation of funds, contradicting the ethical principles of equity and compassion that underpin Zakat.[66]

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[62] G M Naidoo and A Nicolaides, "Prospects and Challenges in Artificial Intelligence Use and the Christian Faith: Augustinian and Other Considerations," *Pharos Journal of Theology* 106, no. 4 (n.d.).

[63] Eko Rial Nugroho, "Implementation Of Sharia-Compliance In Islamic Bank Product Innovations," *Prophetic Law Review* 3, no. 2 (2021), https://doi.org/10.20885/plr.vol3.iss2.art4.

[64] Muhlisin Muhlisin, Syamsul Hilal, and Moh. Bahrudin, "Analisis Literasi Ekonomi Syariah Dan Ekosistem Halal Value Chain Terhadap Perkembangan Ekonomi Syariah Pondok Pesantren Di Provinsi Lampung," *Jurnal Ilmiah Ekonomi Islam* 8, no. 3 (2022): 2603, https://doi.org/10.29040/jiei.v8i3.6762.

[65] B Feriati et al., "The Integration of Science and Technology in Islamic Fiqh: A Contemporary Perspective," *Indonesian Journal of Education Research (IJoER* 6, no. 1 (n.d.): 77–86, https://doi.org/10.37251/ijoer.v6i1.1407.

[66] M T Suleiman Alqudah and M A A Almomani, "Digital Media and Islamic Jurisprudence: Exploring Legal Adaptations and Challenges," *Pakistan Journal of Criminology* 16, no. 2 (n.d.): 1–16, https://doi.org/10.62271/pjc.16.2.1031.1046.

From the perspective of Islamic legal thought, these challenges highlight the epistemological limits of AI. Islamic jurisprudence is not merely a rule-based system but a dynamic interpretive tradition that integrates textual evidence, ethical objectives, and contextual judgment. AI lacks the moral reasoning and contextual sensitivity required to replace human scholars and practitioners. Consequently, AI should function as a supportive instrument rather than an authoritative decision-maker in zakat governance. Human oversight remains essential to ensure that algorithmic outputs align with Shariah principles and social realities.[67]

The ethical risks associated with AI adoption in zakat management also extend to institutional accountability. As decision-making becomes increasingly automated, responsibility may become diffused between system designers, administrators, and institutions. Islamic ethics, however, emphasizes clear moral accountability and the prohibition of harm. Zakat institutions must therefore establish ethical oversight mechanisms that clarify responsibility for algorithmic outcomes, including errors or unintended consequences. This requires interdisciplinary collaboration between technologists, Shariah scholars, and policymakers to develop ethical standards that govern AI use in Islamic philanthropy.[68]

These considerations point to the necessity of an ethical framework that integrates technological innovation with Islamic moral values. Such a framework should address data protection, algorithmic transparency, spiritual integrity, and legal accountability as interconnected ethical domains. Extending classical *fiqh mu'amalat* into the digital sphere, ethical guidelines must define acceptable uses of AI, set boundaries for automation, and ensure that technological tools serve the higher objectives of Zakat, including poverty alleviation, social justice, and human dignity.[69]

The automated AI-based system, even though capable of significantly boosting the effectiveness of the Zakat institutions, presents numerous ethical issues. Laylo believes that AI can help with the automatic process of zakat collection and distribution, as well as increase transparency in the identification of recipients. Zakat organizations in Indonesia are encouraged to be more effective in the following areas of their operations: socialization, volunteer organization, and fund management.[70] Challenges remain in implementing AI, however, notably within the domains of data protection, cybersecurity, and ensuring Shariah compliance. There are also important ethical considerations when applying AI to manage sensitive information about zakat

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[67] I Al Momani, "Ethical Challenges for Using Artificial Intelligence in Understanding Islamic Jurisprudence," *Salud, Ciencia y Tecnología-Serie de Conferencias* 4 (n.d.): 1519, https://doi.org/10.56294/sctconf20251519.

[68] F Alnizar and A Munjid, "The Voice of the Ulema and Dilemma of the Indonesian Ulema Council's Fatwa among Low Literate Society," *Teosofi: Jurnal Tasawuf Dan Pemikiran Islam* 10, no. 1 (n.d.): 74–96, https://doi.org/10.15642/teosofi.2020.10.1.29-51.

[69] F Mahzumi et al., "Cyber-Islamic Moderation In Indonesia: Digital Activism of Islam. Co and IBTimes.Id and Its Implications for Young Muslims," *MIQOT: Jurnal Ilmu-Ilmu Keislaman* 49, no. 1 (n.d.): 22–49, https://doi.org/10.30821/miqot.v49i1.1290.

[70] Al-Ayubi S.T.E.I.T.A.Z.K.I.A.Ascarya S and Taufiq Possumah B, "Examining the Efficiency of Zakat Management: Indonesian Zakat Institutions' Experiences," *International Journal of Zakat* 3 (n.d.).

recipients (*mustahik*) and donors (*muzaki*). Key issues include the privacy of the data, the biases of the algorithms, and fairness in the decisions of the AI.[71]

To overcome these issues, institutions need to implement robust data governance frameworks, minimize bias, and develop explainable AI procedures to ensure there is transparency in their systems. To provide a framework that can remedy these ethical issues and ensure that the Shariah law is being followed, regulatory technology (RegTech) can be employed.[72]

4.6 Comparison Framework of Manual Zakat vs AI-Based Zakat Systems

The evaluation of zakat management performance in Indonesia must be situated within the existing legal and institutional governance framework. The national zakat system is grounded in Law No. 23 of 2011 and Government Regulation No. 14 of 2014, with BAZNAS serving as the national coordinator, supported by Licensed Zakat Institutions (LAZ) and Zakat Collection Units (UPZ), and reinforced by the national digital system SIMBA.[73] Accordingly, the comparison between manual zakat systems and AI-based zakat systems should not be understood merely as a shift from traditional to technological practices. Rather, it reflects differences in institutional capacity to fulfill legally mandated responsibilities related to zakat management, sharia compliance, and public accountability.[74]

Zakat collection is commonly conducted through physical channels or basic transfers that require manual data entry. Zakat calculation, particularly for complex assets such as business income, investments, and mixed sources of earnings, depends largely on the understanding of individual donors and zakat officers. This condition creates room for calculation errors, inconsistent standards across institutions, and variations in management practices.[75]

Performance evaluation thus shifts from procedural compliance alone toward data-driven performance, speed, and accuracy. Automated zakat calculation through Sharia-compliant digital calculators helps reduce human error and improve consistency, especially for donors with complex asset structures.[76] In AI-based systems, automated verification and integrated data processing enable faster and near-real-time workflows. Performance indicators such as approval time, monitoring latency, and reporting speed

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[71] I Hamadou et al., "Unleashing the Power of Artificial Intelligence in Islamic Banking: A Case Study of Bank Syariah Indonesia (BSI," *Mod Financ [Internet* 2 (n.d.): 131–44, https://doi.org/10.61351/mf.v2i1.116.

[72] Muhammad Fahroni Hamsan et al., "The Growth and Development of Wealth From the Islamic System," *Profetika: Jurnal Studi Islam* 24, no. 02 (2023): 226–43, https://doi.org/10.23917/profetika.v24i02.1718.

[73] BAZNAS et al., "& Kajian Strategis -Badan Amil Zakat Nasional Gedung Kebangkitan."

[74] N et al., "Review of Islamic Social Finance and Entrepreneurship (RISFE."

[75] Idris Hidayanto B, Segara Gustanto E, and Nur Rahmawanti I, "THE PROGRESSIVENESS OF ISLAMIC FINANCIAL REGULATIONS IN ENCOURAGING THE GROWTH OF THE HALAL ECOSYSTEM IN THE DIGITAL ERA," n.d.

[76] B Mamluatul Karomah and M Reza Fahlevi, "Prediction of Supporting Factors for the Success of BAZNAS RI Digital Fundraising Using the C4.5 Algorithm," *International Journal of Zakat* 9, no. ue 1) (n.d.).

can be significantly reduced, allowing zakat funds to reach eligible beneficiaries more promptly.[77]

Leakage control constitutes another critical dimension of performance evaluation. Under the manual system, leakage resulting from under-reporting or recording errors is difficult to detect early. Audits are typically periodic and sampling-based, constrained by limited supervisory resources. In AI-based systems, machine learning approaches enable anomaly detection and risk-based audit prioritization using revenue-at-risk metrics.[78] As a result, supervisory performance is assessed not by the number of audits conducted, but by the effectiveness of audits in identifying and recovering unrealized zakat potential.[79]

In terms of zakat distribution to beneficiaries, the manual system faces challenges related to data synchronization and targeting accuracy. Beneficiary data are often fragmented across institutions and difficult to cross-verify, increasing the risk of mistargeting and duplicate assistance. AI-based systems improve performance through integration with national welfare databases such as the Integrated Social Welfare Data (DTKS)[80]. AI can be used to validate beneficiary proposals and support geographic and demographic mapping, while remaining embedded within nationally recognized data structures.

Accountability and transparency also reveal substantial performance differences. Manual systems produce periodic and static reports, with limited access to information for the public and donors. In AI-based systems integrated with SIMBA, reporting can be conducted in real time or near real time.[81] Donors gain the ability to track the allocation of their contributions, while regulators obtain enhanced visibility over institutional performance. From a performance evaluation standpoint, transparency is no longer measured solely by the existence of annual reports, but by the timeliness and openness of information.[82]

Sharia compliance represents a central evaluation dimension. In manual systems, Sharia compliance relies heavily on human supervision and manual audit processes, which are often difficult to trace in detail. In AI-based systems, Sharia compliance must be embedded into an auditable system design. AI-generated recommendations or outputs are required to be documented, traceable, and explainable in accordance with the Sharia audit guidelines issued by the Ministry of Religious Affairs.[83] Consequently,

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[77] Pulungan et al., "The Digital Innovation in Zakat Collection and Distribution: Opportunities and Challenges."

[78] B Sujadmiko et al., "The Urgency of Digital Right Management on Personal Data Protection," *International Journal of Research in Business and Social Science* 10, no. 1 (n.d.): 253–258, https://doi.org/10.20525/ijrbs.v10i1.990.

[79] Agung Nugroho, "Penerapan Manajemen Risiko Perusahaan Modal Ventura Syariah Pada Pembiayaan Bmt (Studi Kasus Pada PT. Permodalan BMT Ventura)" (Universitas Islam Negeri Syarief Hidayatullah, 2018).

[80] BAZNAS et al., "& Kajian Strategis -Badan Amil Zakat Nasional Gedung Kebangkitan."

[81] A Chadjib Halik, I Parakkasi, and R Dwi Ayu Parmitasari, "Blockchain Dan Keuangan Sosial Islam: Merevolusi Zakat Dan Wakaf Untuk Distribusi Kesejahteraan Sosial Yang Lebih Transparan," *Jurnal Cendekia Ilmiah* 4, no. 3 (n.d.): 575–584.

[82] Laylo, "The Impact of AI and Information Technologies on Islamic Charity (Zakat): Modern Solutions for Efficient Distribution," n.d.

[83] A Priantina and M Uula, "AI IN FATWA FORMULATION : TRANSFORMING SHARIA-COMPLIANT FINANCE," n.d.

Sharia compliance performance is not only normative but also administratively verifiable. Data protection further differentiates system performance. Manual systems generally exhibit weak data controls and dispersed documentation, increasing the risk of data breaches. In AI-based systems, the management of donor and beneficiary data is governed by Law No. 27 of 2022 on Personal Data Protection.[84] Principles of privacy-by-design and security-by-design become integral performance indicators, as digital zakat systems must ensure the lawful and ethical handling of sensitive personal data.[85]

Finally, Sharia-oriented digital literacy functions as a supporting factor for AI-based system performance. Manual systems require lower digital capacity but limit efficiency and inclusion. AI-based systems necessitate improved digital literacy among donors, zakat administrators, and beneficiaries through education, partnerships, and the development of a Sharia-compliant digital ecosystem. In long-term performance evaluation, the success of AI-based zakat systems is measured by their ability to enhance management efficiency, transparency, and participation, while remaining fully aligned with Indonesia's legal, institutional, and sharia governance framework.[86]

Table 2. Comparison between the Manual Zakat System and the AI-based Zakat

Evaluation Dimension	Manual Zakat System	AI-Based Zakat System
Governance Context	Operates within national zakat law but relies heavily on human-driven procedures.	Operates within the same legal framework, strengthened by AI as an internal analytical layer within SIMBA.
Institutional Role	Strong dependence on individual amil capacity and manual coordination.	AI supports institutional capacity without replacing BAZNAS authority or Sharia supervision.
Infrastructure	Fragmented or basic digital tools. Manual data entry dominates.	Integrated national digital infrastructure centered on SIMBA with embedded AI functions.
Zakat Collection	Physical channels or basic transfers. Manual recording and verification.	Digital payment platforms with automated verification and recording.
Zakat Calculation	Calculated manually by muzaki or officers. High risk of inconsistency for complex assets.	Automated Sharia-compliant calculators. Consistent and accurate for diverse asset types.
Verification Process	Manual document checks. Sequential and time-consuming.	Automated verification using AI analytics. Faster and data-driven.

[84] Nugroho, "Penerapan Manajemen Risiko Perusahaan Modal Ventura Syariah Pada Pembiayaan Bmt (Studi Kasus Pada PT. Permodalan BMT Ventura)."

[85] Damaris, Rosadi, and Bratadana, "Data Governance for Artificial Intelligence Implementation in the Financial Sector: An Indonesian Perspective."

[86] E Masykuroh, N Hidayati, and Y T Cahyani, "Islamic Corporate Philanthropy in Islamic Banking: Implementation of Zakat Regulation and Sharia Compliance in Indonesia," *Justicia Islamica* 22, no. ue 1) (n.d.), https://doi.org/10.21154/justicia.v22i1.10397.

Operational Efficiency	Slow processing. High administrative workload.	Streamlined workflows. Reduced processing time and administrative burden.
Time-to-Disbursement	Long delay between collection and distribution.	Shorter time-to-disbursement through near real-time processing.
Leakage Control	Under-reporting is difficult to detect. Audits are periodic and sampling-based.	AI detects anomalies and prioritizes audits based on revenue at risk.
Audit Effectiveness	Measured by number of audits conducted.	Measured by audit effectiveness and recovered zakat potential.
Mustahik Targeting	Data is fragmented and often outdated. Risk of mistargeting and duplication.	AI-assisted validation using national welfare data such as DTKS.
Data Integration	Limited cross-institutional data synchronization.	Integrated data flows across zakat institutions and national databases.
Reporting System	Periodic and static reports. Limited real-time visibility.	Real-time or near real-time reporting through SIMBA dashboards.
Transparency	Public access to information is limited and delayed.	Muzaki can track fund allocation. Higher transparency and trust.
Sharia Compliance	Relies on manual supervision and human judgment. Hard to trace decisions.	Embedded, auditable, and explainable AI outputs aligned with Sharia audit guidelines.
Accountability	Procedural accountability based on reports and manual audits.	Data-driven accountability with traceable decision logs.
Leakage Control	Under-reporting is difficult to detect. Audits are periodic and sampling-based.	AI detects anomalies and prioritizes audits based on revenue at risk.
Audit Effectiveness	Measured by the number of audits conducted.	Measured by audit effectiveness and recovered zakat potential.
Mustahik Targeting	Data is fragmented and often outdated. Risk of mistargeting and duplication.	AI-assisted validation using national welfare data such as DTKS.
Data Integration	Limited cross-institutional data synchronization.	Integrated data flows across zakat institutions and national databases.
Data Protection	Weak controls and dispersed documentation. Higher risk of data leakage.	Privacy-by-design and security-by-design are aligned with Law No. 27 of 2022.
Digital Literacy Requirement	Low digital skills are required, but limit efficiency and inclusion.	Requires Sharia-oriented digital literacy for muzaki, amil, and mustahik.

Scalability	Difficult to scale consistently at the national level.	Scalable nationally due to standardized digital and AI-supported systems.
Overall Performance Logic	Focus on procedural compliance and manual control.	Focus on efficiency, accuracy, transparency, and institutional capacity strengthening.

4.7 Artificial Intelligence Within Indonesia's Zakat Architecture

Positioning artificial intelligence within Indonesia's zakat architecture, therefore, requires a pragmatic shift away from abstract governance rhetoric toward an institutional capability perspective. Rather than framing AI as an external or transformative ideal, its most direct and legally coherent role lies in strengthening the capacity of zakat institutions to meet their existing statutory obligations. Within SIMBA-driven workflows, AI can function as an internal analytical layer that enhances auditability, standardization, and reporting efficiency.[87]

Potential applications include automated anomaly detection in transaction logs to flag irregularities, algorithmic reconciliation of collection and disbursement records to reduce reporting discrepancies, and predictive workload routing to optimize verification and distribution processes. By embedding AI functions within SIMBA, the technology becomes anchored to a nationally recognized system already used by BAZNAS and LAZ, thereby resolving common criticisms regarding contextual mismatch or regulatory transplantation from foreign jurisdictions. In this configuration, AI does not replace institutional judgment or governance authority but operates as a decision-support mechanism that reinforces the administrative logic of Indonesian zakat law. This approach aligns AI deployment with legally defined reporting duties, transforming technological innovation into a tool for compliance enhancement rather than institutional disruption.[88]

A second critical institutional constraint shaping AI adoption in Indonesian zakat governance is the formal Sharia supervision regime administered by the Ministry of Religious Affairs. Ministerial Decree No. 733 of 2018 establishes detailed guidelines for Sharia audits over zakat management reporting conducted by BAZNAS and affiliated institutions. This framework directly influences what constitutes acceptable AI use, particularly in sensitive decision areas such as mustahik eligibility assessment, prioritization, and fund allocation. From a governance standpoint, AI-supported decision rules must be designed as auditable controls that can be inspected against Sharia audit criteria. This implies requirements for transparent documentation, traceable decision logs, and explainable outputs that allow auditors to understand how algorithmic recommendations are generated. Opaque or black-box scoring systems that

[87] N I Made, N I A Bunga, and Surya Dewi, "Analisa Limbah Rumah Tangga Terhadap Dampak Pencemaran Lingkungan" lim (2021): 1159–64.

[88] Qisma Halimatun Nisa et al., "Implementasi Sistem Informasi SIMBA: Analisis Dampak Terhadap Efisiensi Pengelolaan Keuangan Zakat Dan Tantangan Operasional Di BAZNAS Kota Madiun - Indonesia: (Implementation of SIMBA Information System: Impact Analysis on Zakat Financial Management Efficiency and Operational Challenges at BAZNAS Madiun - Indonesia," *Al-Muhasib: Journal of Islamic Accounting and Finance* 5, no. 1 (n.d.): 99–114, https://doi.org/10.30762/al-muhasib.v5i1.2241.

cannot be justified during Sharia audits would conflict with existing supervisory mechanisms and undermine institutional legitimacy.[89]

Moreover, mustahik identification in Indonesia operates within a broader welfare-data ecosystem, most notably the Integrated Social Welfare Data (DTKS), which functions as a national reference for identifying priority populations. AI-driven targeting mechanisms can therefore be positioned as tools for cross-validating mustahik proposals against DTKS-linked poverty profiles, reducing duplicate assistance and improving demographic and geographic coverage, while remaining embedded within domestic data structures already used for social policy implementation.[90]

Finally, the deployment of AI in zakat management is legally constrained by Indonesia's personal data protection regime, particularly Law No. 27 of 2022 on Personal Data Protection. Mustahik data typically contains sensitive personal and socioeconomic information, rendering zakat institutions data controllers subject to strict obligations regarding lawful processing, purpose limitation, access control, retention policies, and breach response. Consequently, privacy-by-design and security-by-design principles are not optional enhancements but foundational requirements for any AI-enabled zakat system. These legal constraints reinforce the need for governance-oriented AI deployment, where data pipelines are designed to satisfy regulatory compliance before scaling predictive analytics or automated verification. When viewed holistically, Indonesia's zakat architecture reveals that AI adoption is neither a purely technological nor a purely ethical issue, but a governance challenge situated at the intersection of law, institutional design, Sharia supervision, and digital administration. Integrating AI within this framework requires aligning technological capabilities with statutory reporting duties, supervisory audit mechanisms, welfare data infrastructures, and data protection obligations. Such alignment ensures that AI contributes to measurable improvements in efficiency and accountability while preserving institutional legitimacy and legal compliance within Indonesia’s distinctive zakat governance system.[91]

The Financial Services Authority (OJK) plays a crucial role as the primary regulator and supervisor, ensuring the integration of zakat management within Indonesia's sharia banking sector. This role is manifested through the registration and supervision of Sharia banks, where the OJK mandates these institutions to report their Islamic philanthropy performance in audited annual reports. As a competent authority, the OJK acts as a bridge between national financial policy and sharia compliance, promoting transparency and accountability for banks in managing corporate Zakat. Furthermore, the OJK provides integrative policy input aimed at synchronizing Corporate Social Responsibility (CSR) reporting with Islamic Corporate Philanthropy (ICP) practices to optimize zakat distribution for broader social welfare.[92]

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[89] A Nuraini, “Peran Penyuluh Agama Dalam Meningkatkan Literasi Zakat Dan Wakaf Masyarakat Kabupaten Probolinggo (Studi Pada Kementrian …,” *At Tujjar* 12, no. 01 (2024): 99–114.

[90] D Widyaningsih, Ruhmaniyati, and N Toyamah, “Urgensi Memutakhirkan Data Terpadu Kemiskinan Secara Berkelanjutan Dan Berkualitas: Pembelajaran Dari Studi Kasus Di Enam Daerah Di Indonesia,” *Jurnal Ekonomi Dan Pembangunan* 31, no. 2 (n.d.): 21–42, https://doi.org/10.55981/jep.

[91] Dewan Perwakilan Rakyat, “No Title,” n.d.

[92] Nihayatul Masykuroh, “Sistem Ekonomi Kapitalis, Sosial Dan Islam,” *Alqalam* 22, no. 1 (2005): 101, https://doi.org/10.32678/alqalam.v22i1.1446.

The legal standing underlying this role is rooted in regulatory synergy between banking and zakat management laws. The primary legal basis includes Law Number 21 of 2008 concerning Sharia Banking, which mandates the OJK to regulate and supervise Sharia bank operations, including their social functions in distributing social funds. This role is strengthened by Law Number 23 of 2011 concerning Zakat Management, which positions sharia banks as Zakat Collection Units (UPZ) that must coordinate with BAZNAS. Moreover, OJK Regulations (POJK) regarding Good Corporate Governance and sustainability reporting serve as technical instruments requiring the disclosure of zakat distribution. With this legal framework, the OJK holds full authority to ensure that every sharia financial institution fulfills its zakat obligations in accordance with national regulatory standards and Islamic legal principles.

Zakat management can be improved through digital literacy initiatives that are aligned with Shariah principles. One important step is increasing public awareness of digital zakat instruments and their benefits. Zakat institutions can organize educational seminars or produce simple learning materials that explain how to use online zakat platforms, including how to register, calculate Zakat, and monitor donations. This approach makes the donation process easier and more accessible, which can encourage wider public participation and increase zakat collection.[93]

Another important strategy is building strategic partnerships with institutions that specialize in Islamic finance and technology. Through such collaborations, zakat organizations can develop Shariah-compliant digital tools, such as accurate zakat calculators and management applications. These partnerships also help strengthen digital skills within zakat institutions while ensuring compliance with Islamic financial principles.[94]

In addition, developing a Shariah-compliant digital ecosystem is essential. This includes providing secure payment gateways and mobile applications that follow Shariah requirements, enabling safe, reliable, and convenient zakat transactions for all stakeholders. Community-based digital literacy programs also play a key role. By organizing outreach activities, zakat institutions can help people, especially those with limited technological skills, learn how to use digital zakat services effectively.[95] Overall, strengthening Shariah-oriented digital literacy can make zakat management more efficient, transparent, and fair. It supports better collection and distribution, empowers communities, and helps Zakat fulfill its core mission of reducing poverty and promoting social justice.[96]

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[93] Inggitana Widya Kumala Putri, Tiena Gustina Amran, and Dadang Surjasa, "Application of The Triple Layered Business Model Canvas in Corporate Social Responsibility: Systematic Literature Review," *OPSI* 16, no. 1 (June 2023): 45, https://doi.org/10.31315/opsi.v16i1.8379.

[94] B S Nugroho and D T Prastyo, "Personal Data Protection in the Development of Digital Society (A Maqashid Syariah Perspectives," in *Proceedings of International Postgraduate Conference on Interdisiplinary Islamic Studies*, vol. 2, n.d., 130–143.

[95] B S Nugroho et al., "Understanding ChatGPT : Islamic Worldview Perspective," *Tsaqafah [Internet* 20, no. 2 (n.d.): 443–66.

[96] Hamadou and Suleman, "FinTech and Islamic Finance: Opportunities and Challenges."

5 Conclusion

The integration of Artificial Intelligence and blockchain into Indonesia's zakat management offers a transformative pathway to bridge the gap between potential and actual collection. By embedding AI as an internal analytical layer within the existing SIMBA infrastructure, institutions can automate complex sharia-compliant calculations, expedite time-to-disbursement through real-time reporting, and enhance targeting accuracy using national databases such as DTKS. This study confirms that AI does not replace the hierarchical authority of BAZNAS or Sharia supervisory boards; instead, it functions as a critical decision-support mechanism that strengthens institutional capacity, transparency, and leakage control through risk-based audit prioritization and anomaly detection. However, successful adoption depends on addressing significant legal, ethical, and technical barriers. Challenges such as the regulatory velocity gap, algorithmic bias, and data privacy, as governed by Law No. 27 of 2022, require a governance-centric approach in which technology remains explainable and auditable under Sharia standards. Future implementation must prioritize Sharia-oriented digital literacy and strategic regulatory synergy between the Ministry of Religious Affairs, BAZNAS, and OJK. Ultimately, by aligning technological innovation with the principles of Maqasid al-Sharia, Indonesia can establish a transparent and efficient zakat ecosystem that fulfills its religious mandate and social mission of poverty alleviation.

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