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Reimagining Digital Transformation in Zakat Institutions: Cloud Computing, Governance, and Institutional Resilience

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Abstract

Digital transformation promises efficiency, yet within zakat institutions, efficiency alone has never been sufficient to sustain legitimacy. As Islamic philanthropic organizations increasingly operate under regulatory complexity, rising public expectations, and accelerating technological change, the adoption of cloud computing introduces institutional tensions between digital innovation, Shariah governance, public trust, and the ethical management of religious wealth. This study aims to examine how cloud computing architecture can be strategically adapted and optimized within zakat institutions, with particular attention to the operational and governance context of Malaysia. The study employs a qualitative descriptive-analytical approach through a systematic synthesis of interdisciplinary literature on cloud computing, nonprofit digital transformation, and Islamic wealth management. The findings reveal that cloud transition in zakat institutions cannot be understood as a one-time technological migration, but rather as a recursive socio-institutional transformation shaped by external regulatory pressures, human capital development, organizational maturity, and continuous governance adaptation. The analysis further demonstrates that hybrid cloud and Software as a Service (SaaS) represent the most institutionally viable technological configurations, as they enable operational scalability while preserving data sovereignty, ethical accountability, and compliance with religious oversight. The study also shows that successful digital transformation depends not merely on technological deployment, but on the institution's ability to align innovation with organizational legitimacy, adaptive governance, and long-term social responsibility. These findings imply that cloud adoption within Islamic philanthropic institutions must be approached as an iterative process of institutional learning rather than a finite modernization project. This study contributes to the growing scholarship on Islamic digital philanthropy by proposing an integrated Shariah-compliant cloud transition framework that connects technological innovation, institutional resilience, and sustainable social impact.

Keywords: cloud computing; zakat institutions; shariah governance; Islamic digital philanthropy; institutional adaptation; organizational maturity.

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Introduction

The rapid advancement of digital technology has profoundly transformed the way organizations operate globally, from traditional locally oriented frameworks to highly integrated online environments. One of the leading forces in this disruption is cloud computing, a technology defined as the on-demand provision of information technology

resources, such as servers, storage, databases, and software, through the internet with a flexible usage-based pricing model.[1] This has become increasingly significant considering that cloud computing provides a comparative advantage for organizations through cost efficiency, resource elasticity, and the enhancement of technology-based operational capabilities without the need for substantial infrastructure investment.[2] On the other hand, nonprofit organizations such as zakat institutions, whose role is highly significant in society, often face operational constraints due to limited technology adoption, and even when such technology exists, it is often ineffective because of the substantial costs required to develop their technological systems.[3] This has become increasingly urgent given the various challenges faced by zakat institutions, such as weak supervision,[4] demands for transparency and low public trust,[5] derisking that leads to financial exclusion,[6] intense competition in securing funds,[7] and demands for accountability regarding the outcomes achieved.[8] Therefore, this article argues that cloud computing technology presents an important opportunity to optimize operations and achieve the mission-based objectives of zakat institutions.

The growing academic attention toward the integration of nonprofit organizations in adopting cloud computing has increased,[9] however, previous studies discussing the

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1 Ali Sunyaev, "Cloud Computing," in *Internet Computing*, by Ali Sunyaev (Springer Nature Switzerland, 2024): 165-209; Lewis Golightly et al., "Adoption of Cloud Computing as Innovation in the Organization," *International Journal of Engineering Business Management* 14 (November 2022): 1-17.

2 Michael Armbrust et al., "A View of Cloud Computing," *Communications of the ACM* 53, no. 4 (2010): 50–58; Alexandros Marinos and Gerard Briscoe, "Community Cloud Computing," in *Cloud Computing*, ed. David Hutchison et al., vol. 5931, ed. Martin Gilje Jaatun et al., Lecture Notes in Computer Science (Springer Berlin Heidelberg, 2009): 472-484; Peter Mell and Timothy Grance, "The NIST Definition of Cloud Computing," Special Publication, *National Institute of Standards and Technology*, 2011, 800–145; Ibrahim Abaker Targio Hashem et al., "The Rise of 'Big Data' on Cloud Computing: Review and Open Research Issues," *Information Systems* 47 (January 2015): 98–115.

3 Aisyah Abdul-Rahman et al., "Technological Integration within Zakat Institutions: A Comprehensive Review and Prospective Research Directions," *International Journal of Islamic Thought* 24, no. 1 (2023): 31–43; Ahmad Munawar Ismail et al., "Key Features of Effective Database Management System Guidelines for Assisting Asnaf - Individuals in Need (GAIN)," *Islamiyyat* 47, no. 1 (2025): 66–78.

4 Saeed Awadh Bin-Nashwan, "Alms Tax (Zakat) Law Intricacies: An Institutional and Governance-Based Analysis," *Thunderbird International Business Review*, October 29 (2025): 1–16.

5 Musa Yusuf Owoyemi, "Zakat Management: The Crisis of Confidence in Zakat Agencies and the Legality of Giving Zakat Directly to the Poor," *Journal of Islamic Accounting and Business Research* 11, no. 2 (2020): 498–510; Mahadi Ahmad, "An Empirical Study of the Challenges Facing Zakat and Waqf Institutions in Northern Nigeria," *ISRA International Journal of Islamic Finance* 11, no. 2 (2019): 338–56.

6 Alexandra Spencer and Helen Alderson, *Financial Access Challenges Specific to Non-Profit Organisations, Notably Local and Faith- Based Organisations*, Humanitarian Policy Group (HPG) Outcome Note (ODI Global, 2025): 12.

7 Nuryanti Mustari et al., "Multipartner Governance and the Urgency of Poverty Alleviation Policy: Zakat Fundraising Management," *Cogent Social Sciences* 10, no. 1 (2024): 1-16.

8 Muhammad Iqmal Hisham Kamaruddin et al., "Exploring Shariah Audit Practices in Zakat and Waqf Institutions in Malaysia," *Journal of Islamic Accounting and Business Research* 15, no. 3 (2024): 402–421; Devi Megawati and Zulkifli Zulkifli, "Sharia Auditing in Zakat Institutions: Challenges and Prospects in Indonesia," *Share: Jurnal Ekonomi Dan Keuangan Islam* 14, no. 1 (2025): 145–174.

9 See: Lauri Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations" (Thesis, Jyväskylä: JAMK University of Applied Sciences, 2022); Aparna Raman, "How Do Social Media, Mobility, Analytics and Cloud Computing Impact Nonprofit Organizations? A Pluralistic Study of Information and Communication Technologies in Indian Context," *Information Technology for Development* 22, no. 3 (2016): 400–421; Jeremiah Lucas Williams SR, "Determinants for the Adoption of Cloud Computing among Alaskan Nonprofit Organizations" (Dissertation, Northcentral University, 2021); Hasan Nuseibeh, "Adoption of Cloud Computing in Organizations," paper presented at Proceedings of the Seventeenth Americas Conference on Information

role of technology in improving the management of zakat institutions have shown different tendencies. For instance, studies on technology adoption in zakat institutions have tended to focus on basic operational digitalization, such as the use of social media as an information system,[10] online payment platforms, and mobile applications for the collection and distribution of funds.[11] Within this framework, technology is primarily positioned as an instrument of administrative efficiency and enhanced transparency, with an emphasis on ease of access for *muzakki* and the optimization of *asnaf* (beneficiaries) data management. Although several studies have begun to move toward the integration of more advanced technologies such as fintech and data analytics,[12] the approaches employed still tend to be partial and have not yet addressed the comprehensive transformation of technological infrastructure. In this context, cloud computing emerges as both a conceptual and technological novelty that has not been widely explored in the zakat literature. The importance of cloud computing in the context of zakat institutions lies in its ability to address the classical limitations of Islamic philanthropic organizations, such as resource constraints, data fragmentation, and low interoperability among institutions. Nevertheless, the adoption of cloud computing does not come without obstacles, as the existing literature highlights distinctive operational and legal challenges.[13] Therefore, this study argues that the adoption of cloud computing holds significant potential to optimize the operations of zakat institutions, yet it requires a transition strategy that is aligned with aspects of Sharia compliance, data sovereignty, and institutional governance.

Based on the mapping above, the primary objective of this conceptual article is to examine the potential of cloud computing in optimizing the performance of zakat institutions from the perspective of operational benefits, while simultaneously critically examining its various limitations. Conceptually, this study adopts the cloud computing framework as a strategic infrastructure for digital transformation, as emphasized by Thomas Abell and his colleagues, who argue that cloud computing functions as a "key enabler" that enhances organizational efficiency, scalability, and resilience in the digitalization process.[14] This model developed by Thomas Abell will subsequently be

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Systems, Detroit, Michigan August 4th -7th 2011, 2011; Dana Haywood, "The Relationship between Nonprofit Organizations and Cloud Adoption Concerns" (Thesis, Walden University, 2017).

10 Zaimah Abdullah et al., "Zakat Institutions' Adoption of Social Media," *Journal of Islamic Accounting and Business Research* 14, no. 8 (2023): 1261–1280.

11 Shifa Mohd Nor et al., "Digitizing Zakat Distribution in Malaysia: A Case Study on Application Process at Kedah State Zakat Board," *Samarah: Jurnal Hukum Keluarga Dan Hukum Islam* 8, no. 3 (2024): 1901; Dahlia Bonang et al., "Muslim Gen Z's Intention on Infaq and Sadaqah through Online Payment: An Insight from Indonesia," *Journal of Islamic Accounting and Business Research*, ahead of print, September 29, 2025; Marhanum Che Mohd Salleh and Muhamad Abdul Matin Chowdhury, "Technology Adoption among Zakat Institutions in Malaysia," *International Conference of Zakat*, October 21, 2020, 1–14.

12 Minela Nuhic-Meskovic et al., "Islamic FinTech: A Systematic Literature Review of Trends and Research Gaps," *Journal of Islamic Marketing*, March 23, 2026, 1–33; Amelia Nur Natasha Nazeri et al., "Blockchain Technology in Zakat Management System: Potential and Challenges in Malaysia," *Journal of Islamic Accounting and Business Research*, March 25, 2026, 1–34; Mohamed Cherif EL Amri et al., "Fintech Adoption and Its Investment Impact in Islamic Social Finance: The Case of Zakat," *Qudus International Journal of Islamic Studies (QIJIS)* 12, no. 2 (2024): 213–254; Ahmet Faruk Aysan et al., eds., *Artificial Intelligence and the Future of Islamic Finance*, 1st ed. (Routledge, 2026).

13 رشا حميدة عبد اللطيف, "أثر استخدام تقنيات الحوسبة السحابية في النظام الزكويّ (دراسةٌ فقهيةٌ) The Impact of Using Cloud Computing Technologies in the Zakāt System (A Jurisprudential Study)," *مجلة كلية الدراسات الإسلامية والعربية للبنات بدمنهور* 10, no. 4 (2025): 955-1026.

14 Operationally, cloud computing functions as a key enabler through its ability to: (1) reduce infrastructure costs by shifting from capital expenditure to usage-based operational expenditure (pay-as-you-go), (2)

further developed using the findings of Lauri Pakkala, which focus on the adoption of cloud computing in nonprofit organizations,[15] his study contributes by offering a reinterpretation of zakat digitalization through positioning cloud computing as an infrastructure with the potential to shift the logic of management, data control, and institutional authority within Islamic philanthropy. At the same time, this study provides an initial foundation for formulating a more reflective and contextual direction for adoption amid the structural limitations that have long shaped zakat management practices.

Following the introduction, this article outlines the research methodology employed as the conceptual foundation for analyzing cloud computing in the context of organizational transformation. Subsequently, the article presents the main findings related to cloud computing models and their general implications, particularly in terms of efficiency, scalability, and institutional adaptability. These findings are then critically discussed by adapting them to the specific context of zakat management to highlight both the opportunities and the limitations of their implementation. In the final section, this article provides strategic recommendations to encourage a more contextual adoption of cloud computing within zakat institutions, while simultaneously identifying directions for future research to enrich and further deepen the analytical framework developed in this study.

Research Method

This study employs a descriptive-analytical qualitative approach, functioning primarily as a conceptual paper based on an extensive literature review.[16] This study does not rely on primary field data; rather, it constructs a theoretical and analytical framework through the synthesis of existing knowledge on digital technology and Islamic philanthropy.[17] The selection of this qualitative approach is justified as it allows for an in-depth and nuanced exploration of how technology models, which are inherently rigid, can be adapted to align with religious and administrative boundaries in the management

enhance efficiency and service delivery speed through process streamlining and system integration, (3) provide dynamic scalability of resources, enabling organizations to respond to demand fluctuations with minimal service disruption, and (4) strengthen system resilience through business continuity and disaster recovery mechanisms based on distributed data architectures. In addition, cloud computing supports the development of advanced analytical capabilities and emerging technologies, thereby expanding organizational capacity for data-driven decision-making. See: Thomas Abell et al., *Cloud Computing as a Key Enabler for Digital Government across Asia and the Pacific*, no. 77 (Asian Development Bank, 2021), 1–38

15 Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

16 Jens Lauterbach and Benjamin Mueller, "Adopt, Adapt, Enact or Use? A Framework and Methodology for Extracting and Integrating Conceptual Mechanisms of IT Adoption and Use," in *Information Systems and Global Assemblages. (Re)Configuring Actors, Artefacts, Organizations*, vol. 446, ed. Bill Doolin et al., IFIP Advances in Information and Communication Technology (Springer Berlin Heidelberg, 2014).

17 Studies in information systems reveal an epistemological fragmentation between positivist approaches, which emphasize individual determinants of technology adoption, and constructivist perspectives, which highlight the role of socio-organizational contexts in shaping technological practices. The limitations inherent in each tradition call for a conceptual synthesis that bridges these perspectives to produce a more comprehensive and context-sensitive understanding of technology adoption. Within this framework, a conceptual study grounded in literature synthesis serves not merely to compile prior findings, but to reconstruct and adapt technological models to specific institutional settings, including value-based governance environments such as zakat institutions. See: Lauterbach and Mueller, "Adopt, Adapt, Enact or Use?"

of Islamic wealth. The subject of this study focuses on the operational and governance frameworks of zakat institutions, particularly within the context of Malaysia, while the material object of the study is the strategic adoption and optimization of cloud computing technology.

The data collection technique is entirely based on secondary data sources compiled through a comprehensive review of documents and literature. These sources include a balanced selection of reputable journal articles, conference proceedings, and up-to-date institutional reports published between 2011 and 2026. The collected literature covers two main domains. First, technical and business publications that describe the implementation of cloud computing, such as Infrastructure, Platform, and Software as a Service.[18] Second, contemporary scholarly works on the management of Islamic wealth. For this second domain, the study specifically refers to recent empirical studies concerning the optimization of zakat collection by local governments,[19] the fundamental role of zakat as a structured social security instrument,[20] and the behavioral motivations underlying Muslim philanthropists from elite circles.[21] Data analysis was conducted using thematic and descriptive-analytical methods. The collected literature was first classified into major themes, with a strict separation between the general capabilities of cloud computing technology and its specific and complex applications within the Islamic nonprofit sector. The interpretation of these findings was guided by an empirical theoretical framework of Islamic wealth management and the principles of Sharia governance. Through this legal-religious framework, this study concludes that cloud computing, particularly Software as a Service (SaaS), must evolve into secure and Sharia-compliant systems under religious and regulatory supervision.

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[18] Pakkala, in his study, developed a cloud computing maturity model by restructuring the *AWS Cloud Transformation Maturity Model* (AWS CTMM) through the selection of evaluation items, initial validation via survey, and practical testing in workshops. While largely retaining the original evaluation indicators, he expanded the model by introducing new dimensions not previously included, such as a soft skills capability area and a distinct security and compliance domain divided into general and cloud-specific capabilities. The model was further adapted to the needs of non-profit organizations by incorporating data protection and regulatory compliance requirements, particularly those related to the European Union framework, as well as technical data handling practices. This resulted in a more comprehensive, context-sensitive, and practically applicable maturity assessment tool. See: Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations": 40-44; According to Abell et al., cloud computing reduces infrastructure costs while improving government operational efficiency, enabling scalable public services without disruption during demand spikes, and strengthening resilience through business continuity and disaster recovery mechanisms. It also enhances cybersecurity capacity, expands access to advanced analytics such as artificial intelligence, and supports human resource development by ensuring continuous technological upgrading. See: Abell et al., *Cloud Computing as a Key Enabler for Digital Government across Asia and the Pacific.*

[19] Aznan Hasan et al., "A Proposed Human Resource Management Model for Zakat Institutions in Malaysia," *ISRA International Journal of Islamic Finance* 11, no. 1 (2019): 98–109; Boedi Satria et al., "Implementation of Presidential Instruction Number 3 of 2014 by the Regional Government in Optimizing the Collection of Zakat, Infaq, and Sedekah for ASN in Bukittinggi City," *Muttaqien; Indonesian Journal of Multidiciplinary Islamic Studies* 7, no. 1 (2026): 57-70.

[20] Hafas Furqani et al., "Zakat as An Instrument for Social Security System: Justification and Framework," Indonesian Conference of Zakat - Proceedings, 2025, 287–97.

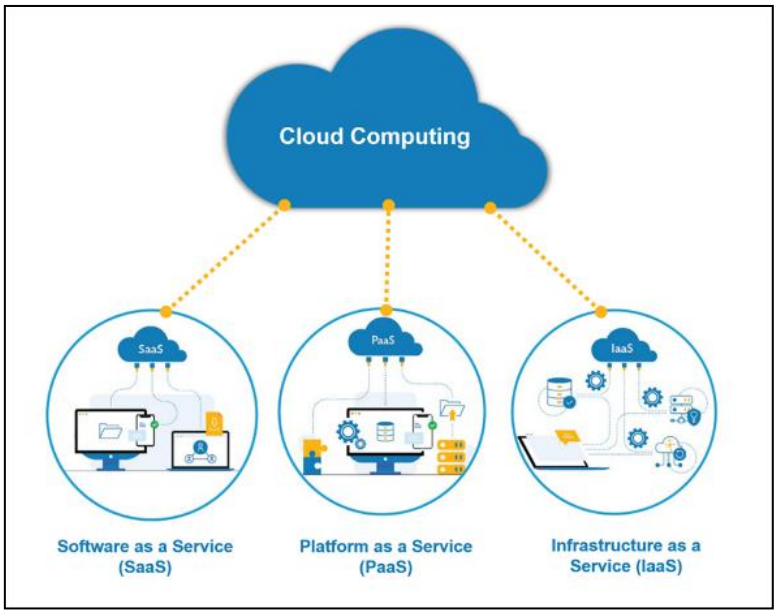
[21] Mohammad Zainal and Muhsin Nor Paizin, "Weighed Altruism: The Construction of Identity and Hidden Motivations in the World of Elite Philanthropy," Asian Journal of Muslim Philanthropy and Citizen Engagement 2, no. 1 (2026): 75–98.

Results

The Architecture and General Capabilities of Cloud Computing

1. General type of cloud computing

Before elaborating in detail on the technical characteristics and operational implications of cloud computing, it is important to first understand the conceptual framework that underlies it. Cloud computing not only represents technological innovation but also reflects a paradigm shift in the way organizations manage digital resources, infrastructure, and information services.[22] Therefore, the following discussion begins with a mapping of the basic architecture and the main service models in cloud computing, which serve as the foundation for assessing its potential, benefits, and limitations more comprehensively. In this regard, to evaluate the potential of cloud computing, it is first necessary to outline its operational architecture and primary service models. The findings from this literature review classify cloud computing into three distinct categories, as illustrated in Figure 2: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).[23]



Source: Mell & Grance (2011) and Abell et al. (2021)

Figure 1. Type of Cloud Computing

The implementation of IaaS essentially enables organizations to lease server hardware and network infrastructure to host applications, thereby eliminating the need for physical data centers.[24] PaaS providers enhance this utility by managing system software and operating systems, thereby transferring the responsibility for updates and security patches away from the organization.[25] Finally, SaaS represents the most

[22] Ramzi El-Haddadeh, "Digital Innovation Dynamics Influence on Organisational Adoption: The Case of Cloud Computing Services," *Information Systems Frontiers* 22, no. 4 (2020): 985–999.

[23] Mell and Grance, "The NIST Definition of Cloud Computing"; Abell et al., *Cloud Computing as a Key Enabler for Digital Government across Asia and the Pacific.*

[24] Nicolae Paladi et al., "Providing User Security Guarantees in Public Infrastructure Clouds," *IEEE Transactions on Cloud Computing* 5, no. 3 (2017): 405–419.

[25] Oliver Gass et al., "PaaS Characteristics for Productive Software Development: An Evaluation Framework," *IEEE Internet Computing* 18, no. 1 (2014): 56–64.

accessible and most widely used category, in which providers deliver fully network-based applications directly to end users.[26] Within the SaaS model, the underlying source code is managed uniformly across all customers, thereby enabling the seamless deployment of new features without requiring significant internal IT intervention. The transition toward these cloud computing models presents substantial operational benefits for nonprofit organizations.

Primarily, cloud computing provides unparalleled mobility and scalability. Organizations are no longer bound by traditional computing arrangements that require the purchase of fixed long-term licenses or the continuous expansion of on-site physical servers. Instead, they can request additional data storage and user accounts strictly according to current needs, thereby fostering a flexible working environment in which critical information can be accessed anytime and from anywhere.[27] In addition, this model generates significant cost savings.[28] By eliminating the need to purchase, house, and maintain expensive physical hardware, nonprofit organizations are able to redirect their limited financial resources from direct IT administration toward their core mission.[29] These organizations have personnel working across various locations—there are continuously off-site projects, remote participants, and board members who frequently travel. With cloud computing, data access becomes easily available from any location, at any time, and through any computing device. This means that access to critical information is available twenty-four hours a day, seven days a week. Furthermore, regardless of location, collaboration and data sharing with other parties become simple. In addition, cloud computing has a symbiotic relationship with Big Data and the Internet of Things (IoT), by providing the storage capacity and real-time processing power required to analyze massive datasets that cannot be feasibly managed by traditional computers. Big Data is defined as large-scale datasets collected from extensive network-based systems, while the Internet of Things refers to a collection of devices in the world that gather and share information. IoT and cloud computing complement one another and are often marketed together.[30] Without cloud computing, there would be substantial untapped potential in Big Data analytics, as existing computers are unable to feasibly analyze data at such a scale, and may even be entirely incapable of doing so. The primary reason we collect Big Data is that services are now available that can collect, store, and process it.

Nevertheless, the findings of Musarat et al. and Dutta et al. also identify a number of inherent limitations. In this regard, cloud computing is entirely dependent on a stable internet connection; connectivity disruptions or provider downtime directly halt an organization's operational capabilities. In addition, the "pay for what you use" model, although reducing initial costs, creates challenges in long-term budgeting as usage increases. The most significant vulnerability, however, is the loss of physical ownership of data. When information is stored on third-party servers, organizations become subject

[26] Sushil Bhardwaj et al., "An Approach for Investigating Perspective of Cloud Software-as-a-Service (SaaS)," *International Journal of Computer Applications* 10, no. 2 (2010): 44–47.
[27] Mell and Grance, "The NIST Definition of Cloud Computing."
[28] Lewis Golightly et al., "Adoption of Cloud Computing as Innovation in the Organization," *International Journal of Engineering Business Management* 14 (November 2022): 1–17.
[29] Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."
[30] Hashem et al., "The Rise of 'Big Data' on Cloud Computing."

to the provider's terms of service, security protocols, and potential data breaches, thereby limiting their control over how sensitive information is stored or shared. Furthermore, if a provider decides to discontinue a product, organizations are required to migrate to another solution. Even when a product remains available, changes in the terms of service may render the program no longer attractive to the organization, which may also force migration. In addition, the ease of acquiring SaaS may encourage individuals within the organization to subscribe to various available software options. When employees make technology decisions without consultation, they create a situation known as "shadow IT."[31] Therefore, staff members who possess curiosity and functional needs often become the parties who select cloud-based products or technologies, while bypassing centralized security protocols.

2. Cloud computing adoption for non-profit organizations

The adoption of cloud computing in nonprofit organizations is not merely a technological choice, but rather a process of organizational transformation that encompasses operational, financial, governance, and workplace cultural dimensions.[32] Unlike profit-oriented organizations that possess relatively stable resources, nonprofit organizations face budget constraints, dependence on donations, as well as more flexible and distributed working structures. In this context, cloud computing functions as a strategic enabler that bridges these limitations with the need for efficiency and scalability. Conceptually, cloud adoption is driven by three main rationalities: cost efficiency through the shift from capital expenditure to a subscription-based model, operational flexibility in adjusting capacity according to organizational needs, and enhanced accessibility and cross-location collaboration.[33] However, this process does not occur linearly. The success of adoption is highly dependent on the organization's internal capabilities, including technical competence, managerial capacity, digital literacy, and institutional readiness in managing change. Therefore, an analytical framework is required to comprehensively map the level of adoption maturity. The maturity model developed by Lauri Pakkala (see Table 2) provides a systematic illustration of how organizations evolve from a condition of having no capabilities toward a stage of strategic integration.[34]

Table 1. New maturity model grid for non-profit organizations

Evaluation Domain	Evaluation Item	Stage 0 (None)	Stage 1 (Initial)	Stage 2 (Opportunistic)	Stage 3 (Systematic)	Stage 4 (Managed/Measurable)	Stage 5 (Optimized)
Skills (Cloud)	Have employees gone through formal cloud training?	No formal cloud training exists in the organisation.	Training occurs at the individual level, driven by personal initiative without organisational coordination.	Training is conducted based on team-level discussions, with some organisational support emerging.	A structured training plan exists based on business unit needs, and its effectiveness is measured using KPIs.	Training plans are embedded in organisational structures, and the culture supports additional individual skill development.	Training is continuously updated in anticipation of technological change, supported by a proactive organisational learning culture.
	Do employees	No understandin	Some individuals	Approximately 10–25% of employees	Around 25–50% of employees	Approximately 50–75% of employees	All employees possess extensive

[31] Jean Pierre Guy Gashami et al., "Privacy Concerns and Benefits in SaaS Adoption by Individual Users: A Trade-off Approach," *Information Development* 32, no. 4 (2016): 837–852.

[32] Haywood, "The Relationship between Nonprofit Organizations and Cloud Adoption Concerns"; Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

[33] Abell et al., *Cloud Computing as a Key Enabler for Digital Government across Asia and the Pacific.*

[34] Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

	have the necessary understanding of service management concepts?	g of service management concepts is present.	possess limited understanding of service management principles.	demonstrate an appropriate level of understanding.	possess sufficient understanding, often supported by certifications.	demonstrate strong and applicable understanding.	understanding, including alignment with business strategy.
	Do employees have the necessary technical cloud skills?	No cloud expertise exists within the organisation.	A few individuals possess limited and fragmented knowledge of cloud technologies.	Around 10–25% of staff have intermediate cloud-related technical skills.	Approximately 25–50% of employees demonstrate advanced cloud competencies.	Around 50–75% of staff possess advanced and applicable technical expertise.	All employees demonstrate extensive, certified, and strategically aligned cloud expertise.
Skills (General)	Do employees demonstrate necessary soft skills?	Work is performed mechanically with no observable initiative or responsibility.	Some employees demonstrate basic problem-solving capabilities.	Employees begin to show responsibility within defined task boundaries.	A clear sense of responsibility and commitment to quality is evident.	Employees demonstrate ownership, initiative, and willingness to experiment.	A strong organisational culture of responsibility, innovation, and quality is fully institutionalised.
FinOps	Are there capabilities for purchasing cloud services?	No structured purchasing capability exists.	Purchasing processes are bureaucratic and inefficient.	Semi-structured purchasing exists with some designated responsible individuals.	Purchasing is governed by role-based KPIs and defined procedures.	Efficient purchasing processes are implemented and aligned with team-level KPIs.	Purchasing processes are automated, optimised, and fully integrated into operations.
FinOps	Is financial control over cloud spending implemented?	No financial control; only invoices are received and processed.	Spending is tracked retrospectively without proactive management.	Budgeting exists at the project level with limited control.	Spending is governed and authorised according to structured processes.	Real-time monitoring and authorisation mechanisms are in place.	Fully automated budgeting and financial integration with operational systems are achieved.
Governance	Is the success of cloud services evaluated?	No evaluation of cloud service success is conducted.	Success is defined informally by users without standardisation.	KPIs can be used, but their application is inconsistent.	Formal KPI-based evaluation processes are implemented.	KPI results are systematically reviewed and analysed.	Continuous evaluation is aligned with broader business outcomes and strategic objectives.
Security & Compliance (Cloud)	Does security training include cloud-specific security aspects?	No security training is provided.	Security issues are discussed informally.	Security training is available but not mandatory.	Systematic security training programmes are implemented.	Certification in cloud security is required for personnel.	Security certification and training are fully integrated into business objectives.
Security & Compliance (General)	Is sensitive data handled responsibly?	No encryption or structured data protection mechanisms are implemented.	Basic encryption mechanisms are applied inconsistently.	Data handling practices vary across projects.	Access control mechanisms are systematically implemented.	Audit trails and monitoring systems are established.	Continuous monitoring, compliance enforcement, and proactive risk management are implemented.
Design	What is the organisational capability for cloud application design?	Applications are limited to traditional client–server architecture.	Some cloud technologies are used in isolated cases.	Cloud storage and compute capabilities are utilised.	Applications are designed for resilience and reliability.	Applications are scalable and adaptable to demand changes.	Systems are modular, reusable, and capable of self-scaling and self-healing.

Source: Pakkala (2022)

The model above demonstrates that the maturity of cloud computing adoption in nonprofit organizations is multidimensional and cannot be reduced to a single indicator. Each domain represents a critical aspect that collectively determines the extent to which an organization can optimally utilize cloud technology. First, the skills domain emphasizes that the success of cloud adoption is highly dependent on human resource capacity. Not only are technical skills required, but conceptual competencies such as an understanding of service management, as well as non-technical capabilities such as responsibility and problem-solving, also become determining factors. This indicates that digital transformation in nonprofit organizations is fundamentally a human transformation, rather than merely a technological transformation. Second, the FinOps domain reveals a dimension that is often overlooked in the technology adoption literature, namely cloud-based financial management.[35] In the context of nonprofit

[35] Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

organizations that face budget constraints, the ability to control, monitor, and optimize cloud expenditures becomes crucial. Without such mechanisms, the flexibility offered by cloud computing may instead generate financial uncertainty. Third, the governance domain highlights the importance of performance-based evaluation mechanisms. In the early stages, the success of cloud services is often defined subjectively; however, as maturity increases, organizations begin to adopt measurable performance indicators that are integrated with strategic objectives. This indicates a shift from an ad hoc approach toward evidence-based governance. Fourth, the security and compliance domain becomes highly significant in the context of nonprofit organizations that manage sensitive data, such as donor or beneficiary information. The increasing maturity within this domain reflects a shift from mere awareness of security toward the full integration of security, regulatory compliance, and organizational strategy. Fifth, the design domain demonstrates the evolution of system architecture from being static to becoming adaptive and resilient.[36] At the highest stage, the system is not only capable of handling dynamic workloads, but also possesses self-scaling capabilities and modularity, which are highly important for long-term service sustainability.

Although this model provides a comprehensive framework, according to Lauri Pakkala, its implementation in nonprofit organizations is not free from challenges. Variations in capacity across teams, resource constraints, as well as differences in levels of digital literacy may hinder both the evaluation process and the achievement of higher levels of maturity. In addition, several indicators within the model—such as the requirement for full certification or comprehensive automation—may be overly idealistic for small- to medium-scale organizations.[37] Therefore, this maturity model should not be understood as a normative standard that must be fully achieved, but rather as a reflective tool for identifying capability gaps and formulating realistic improvement strategies. In the context of nonprofit organizations, a gradual and contextual approach becomes essential, in which priority is given to aspects that are most relevant to the organization's operational needs and social mission.

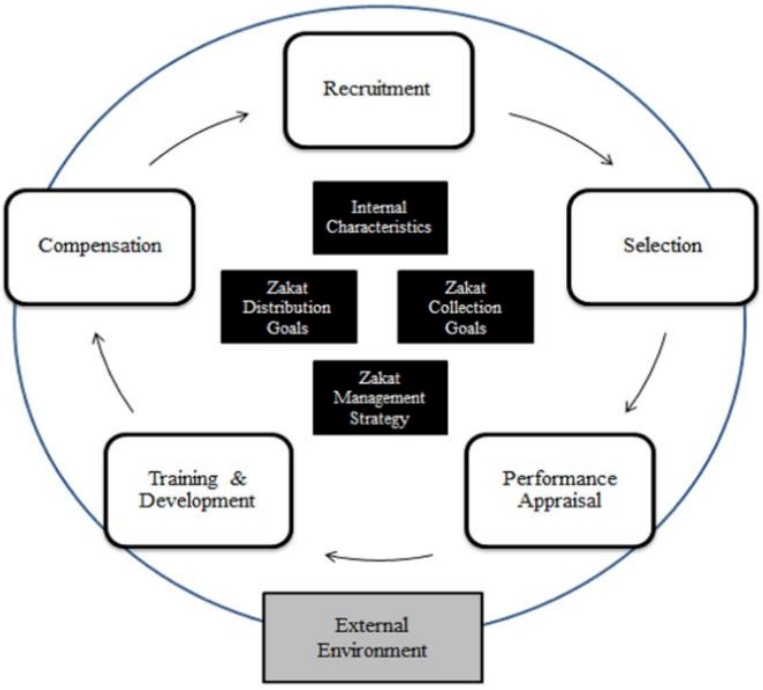
Strategic Adaptation and Optimization for Zakat Institutions

Although the general capabilities of cloud computing have been extensively documented, its implementation in zakat institutions requires a far more nuanced conceptual framework. Zakat management extends beyond standard corporate administration; it is a Sharia-based obligation that functions as a core instrument within the Islamic social security system. To effectively distribute wealth and operate as a non-extractive source of revenue for the empirical Islamic treasury, zakat institutions require data systems that are highly secure, agile, and integrated.[38] Cloud computing, particularly through customized SaaS platforms, enables regional and national zakat agencies to optimize their collection efforts by seamlessly synchronizing data across government institutions and the private sector.[39] In addition, cloud-based Customer Relationship Management

[36] Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."
[37] Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."
[38] Furqani et al., "Zakat as An Instrument for Social Security System: Justification and Framework."
[39] Satria et al., "Implementation of Presidential Instruction Number 3 of 2014 by the Regional Government in Optimizing the Collection of Zakat, Infaq, and Sedekah for ASN in Bukittinggi City."

(CRM) tools can significantly optimize donor engagement.[40] By leveraging data analytics and Big Data processing, zakat institutions are able to track donation patterns, segment donor demographics, and tailor communication strategies with greater precision in order to strengthen donor loyalty and the sustainability of contributions.

Within a more operational framework, the optimization of cloud computing cannot be understood merely as a matter of technological infrastructure or system integration. Its successful implementation is fundamentally dependent on the organizational capacity to prepare, manage, and continuously develop human resources capable of adapting to digital transformation. This becomes particularly significant in nonprofit institutions, where operational effectiveness is often shaped not only by technological readiness, but also by the competence, commitment, and institutional values embodied by organizational actors. In this context, human resources function not simply as system users, but as strategic enablers who translate technological capabilities into sustainable organizational performance. To better understand how this organizational readiness is constructed, the Human Resource Management (HRM) model proposed by Aznan Hasan et al. positions recruitment, selection, performance appraisal, training and development, as well as compensation as an interconnected and continuous cycle (see Figure 3).[41]



Source: Aznan Hasan et al. (2019)

Figure 2. Proposed HRM model for zakat institutions

An appropriate recruitment process becomes the foundation for identifying potential zakat talent; without it, the selection of suitable candidates for strategic

[40] Michael Jay Polonsky and Adrian Sargeant, "Managing the Donation Service Experience," *Nonprofit Management and Leadership* 17, no. 4 (2007): 459–476.

[41] Hasan et al., "A Proposed Human Resource Management Model for Zakat Institutions in Malaysia."

positions will be difficult to achieve. Subsequently, performance appraisal and capacity development ensure the continuous enhancement of amil competencies, while compensation functions to maintain motivation and retention. All these subsystems must be aligned with the primary objectives of zakat institutions, namely collection targets, distribution, and overall zakat management strategies.[42] Therefore, human resource strategy functions as a strategic instrument that directs the achievement of institutional objectives, rather than merely serving as an administrative function.

This integration becomes even stronger when linked to the cloud computing adoption maturity model. The multidimensional approach demonstrates that the success of digital transformation cannot be reduced to technological aspects alone, as it depends on several interconnected key domains.[43] The skills domain emphasizes that the success of cloud adoption is largely determined by human resource capacity, both in technical skills and in conceptual and non-technical competencies such as problem-solving and responsibility. In this context, Human Resource Management (HRM) and the strengthening of amil capacity become essential prerequisites, indicating that digital transformation is fundamentally a human transformation. The FinOps domain highlights the importance of cloud-based financial management, particularly for zakat institutions operating under budget constraints. The ability to control and optimize costs becomes crucial to ensure that the flexibility offered by cloud computing does not lead to financial uncertainty. Furthermore, the governance domain marks a shift toward performance-based governance, in which indicators of success are measurable and integrated with the strategic objectives of zakat institutions. The security and compliance domain becomes highly important considering that zakat institutions manage sensitive data, both from donors and *asnaf*, making data security not merely a technical issue, but also one that concerns compliance with *Sharia* principles and regulatory frameworks. Meanwhile, the design domain reflects the evolution of system architecture toward adaptive, modular, and resilient models, enabling zakat institutions to respond to changing needs in a flexible and sustainable manner.

Nevertheless, the implementation of this maturity model in zakat institutions is not free from structural challenges, such as variations in capacity across teams, resource constraints, and differences in levels of digital literacy. Therefore, this model should be positioned as a reflective tool for identifying capability gaps and formulating realistic and gradual improvement strategies. In this context, a contextual approach becomes essential, in which priority is directed toward aspects that are most relevant to the operational needs and social mission of zakat institutions. On the other hand, this technological transition must still consider the administrative sensitivities that are distinctive to the Islamic philanthropic sector. The storage of the personal financial data of *asnaf* and donors on third-party servers raises serious concerns regarding data sovereignty and Islamic ethics. Therefore, the adoption of cloud computing requires strict oversight from religious authorities, regulators, and *Sharia* advisors. Cloud services must be adapted to the character of *amanah*-based operations, so that technological optimization does not compromise ethical principles and public trust.

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42 Hasan et al., "A Proposed Human Resource Management Model for Zakat Institutions in Malaysia."

43 Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

Strategically, cloud integration must be positioned as a primary catalyst for community economic empowerment. A centralized database enables the distribution of ZISWAF funds to become more accurate and better targeted, while simultaneously preventing duplication. A hybrid approach to data management—by separating non-sensitive functions from highly confidential data—becomes a solution for maintaining a balance between technological efficiency and normative compliance. Furthermore, the utilization of predictive analytics enables zakat institutions to move from a reactive toward a proactive approach, with the ability to map poverty trends and potential crises at an earlier stage. To summarize the overall conceptual findings that have been discussed, Table 2 below presents a structured synthesis of the main dimensions, key components, and strategic implications for zakat institutions in the process of technology-based adaptation and optimization.

Table 2. Synthesis of strategic adaptation and optimization framework for zakat institutions

Dimension	Key Components	Main Findings	Strategic Implications for Zakat Institutions
Technology (Cloud Computing)	Data integration, SaaS, CRM, Big Data	Cloud computing enables cross-sector data synchron ization and optimizes fund raising activities as well as donor engagement.	Digitalization should be directed toward improving efficiency, transparency, and accuracy in the distribution of ZISWAF funds.
Human Resource Management (HRM)	Recruitment, selection, appraisal, training, compensation	HRM operates as a cyclical process and determines the quality of amil as the primary actors of institutional trans formation.	Human resource strategies must be integrated and aligned with zakat collection and distribution objectives.
Skills (Maturity Model)	Technical and non-technical competencies	Digital transformation de pen ds on human capacity rather than technology alone.	Strategic investment should prioritize enhancing digital literacy and analytical com petencies among *amil*.
FinOps	Cloud cost control and optimization	The flexibility of cloud services may generate finan cial risks without effective management.	Cost monitoring mechanisms and usage-based efficiency strategies are required.
Governance	Performance indicators and evaluation	Governance is shifting from subjective decision-making toward evidence-based gover nance.	Data-driven evaluation sys tems should be strengthened and integrated with strategic objectives.
Security and Compliance	Data protection and Sharia compliance	Zakat data are highly sensitive and require robust security standards.	The implementation of hybrid cloud architecture and conti nuous Sharia oversight beco mes essential.
System Design	Modular and adaptive architecture	Systems evolve from static structures toward flexible and resilient architectures.	IT infrastructure must be scalable and capable of responding to changing orga nizational needs.
External Environment	Regulation, economy, technology	External factors significantly influence institutional stra tegy and operational prac tices.	Responsive and sustainable institutional adaptation is required.
Operational Strategy	Alignment and iterative development	Transformation must remain aligned with core institutional objectives and be implemented progressi vely.	Priority should be given to critical domains while organi zational capacity is developed gradually.
Social Impact	Proactive impact and targeting	Data analytics enables a more proactive approach to zakat distribution.	Zakat institutions can antici pate *mustahik* needs and

			improve the effectiveness of social interventions.
Ethics and Amanah	Data sovereignty, trust	The use of digital technology may create ethical risks if not properly governed.	Technology implementation must remain grounded in Sharia principles and preserve public trust.
Contextuality	Organizational capacity	Not all maturity indicators are equally relevant across institutions.	Implementation approaches must remain flexible, realistic, and aligned with institutional scale and internal capacity.

Source: authors compilation (2026)

Table 1 demonstrates that the transformation of zakat institutions is an integrative and multidimensional process, in which technology, human resources, governance, and ethics cannot be separated from one another. Cloud computing indeed provides the technical foundation through data integration and operational efficiency, yet its success is highly determined by the quality of human resources, particularly the capacity of *amil* to manage and utilize such technology. This confirms that digital transformation in zakat institutions is fundamentally an institutional transformation centered on human capacity. On the other hand, the dimensions of FinOps, governance, and security indicate that technology adoption brings new consequences in the form of the need for financial control, evidence-based governance, and strict data protection. Without strengthening these aspects, technological flexibility may instead create risks, both financially and ethically. Therefore, hybrid approaches, *Sharia* oversight, and performance-based evaluation systems become inseparable elements.

Furthermore, the dimensions of system design, the external environment, and operational strategy emphasize the importance of flexibility and adaptation. Zakat institutions are required to build systems that are not only efficient, but also resilient to regulatory changes, economic dynamics, and technological developments. Transformation must also be carried out gradually and strategically, with a focus on the most relevant strategic priorities. Finally, the dimensions of social impact, ethics, and contextuality affirm that the entire optimization process must not lose sight of the primary objective of zakat institutions, namely the empowerment of *mustahik* and the preservation of public trust as an *amanah*. Technology must be directed toward improving the accuracy of distribution and social impact, while remaining compliant with Sharia principles. Therefore, the success of adaptation strategies is not measured solely by technical efficiency, but by their ability to maintain a balance between innovation, accountability, and the normative values of Islam.

The Transitioning Process to the Cloud: A Conceptual Framework

Digital transformation in zakat institutions cannot be understood merely as the migration of conventional information technology. In this regard, it must be understood as a process of institutional adaptation that requires the integration of digital innovation, organizational governance, and compliance with *Sharia* principles.[44] Unlike nonprofit organizations in general, zakat institutions manage public trust funds and highly

[44] Hilmi Ridho et al., "The Evolution of Islamic Philanthropy in Indonesia's Digital Age (2016–2023)," *Al-Ahkam* 35, no. 1 (2025): 31–58.

sensitive financial data, both related to donors and *mustahik*,[45] thereby making the adoption of cloud computing not only present opportunities for operational efficiency, but also generate new demands concerning data sovereignty, information security, institutional accountability, and religious legitimacy. In this context, the selection of cloud architecture—whether private, public, hybrid, or multi-cloud—cannot be based solely on technical considerations,[46] but must also consider its compatibility with operational needs, the characteristics of zakat data, as well as the regulatory and ethical requirements that govern the institution.

At the implementation level, the transition toward cloud computing also requires a comprehensive evaluation of organizational functions, ranging from donor Customer Relationship Management (CRM), data synchronization across institutions, ZISWAF distribution tracking, to internal communication mechanisms and project management. In many cases, the hybrid cloud model emerges as the most relevant approach because it enables zakat institutions to separate non-sensitive operational functions that require high flexibility from financial data and *mustahik* databases that require strict institutional control. Nevertheless, the success of technological migration is not determined solely by infrastructure readiness, but also by the organizational capacity to establish security protocols, manage operational risks, avoid shadow IT practices, and ensure that the entire digitalization process remains aligned with the social objectives and the principle of *amanah* inherent in zakat institutions. Furthermore, this transformation process cannot be understood as a linear and one-time technology project.

On the contrary, cloud adoption in zakat institutions is a cyclical process, involving continuous organizational learning, consistent performance evaluation, human resource capacity development, and technology audits that operate alongside Sharia audits. In this context, the Human Resource Management model developed by Aznan Hasan emphasizes that recruitment, selection, performance appraisal, training and development, as well as compensation constitute the primary foundation for building the readiness of *amil* as the driving actors of digital transformation.[47] At the same time, the New Maturity Model Grid for Non-Profit Organizations developed by Lauri Pakkala demonstrates that the success of cloud adoption must be evaluated multidimensionally through the domains of skills, FinOps, governance, security and compliance, as well as design,[48] thereby ensuring that organizational maturity is not measured solely by the successful implementation of technology, but also by institutional sustainability, resilience, and adaptive capacity. Based on this conceptual synthesis, this study proposes an integrative framework that positions cloud computing transition in zakat institutions as a continuous cycle of strategic adaptation.

Building upon the conceptual synthesis developed throughout this study, the proposed framework positions cloud transition in zakat institutions as a multidimensional and iterative process rather than a one-time technological migration. The framework is designed to capture how digital transformation within Islamic

45 Zainal and Paizin, "Weighed Altruism."
46 Mell and Grance, "The NIST Definition of Cloud Computing."
47 Hasan et al., "A Proposed Human Resource Management Model for Zakat Institutions in Malaysia."
48 Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

philanthropic institutions is continuously shaped by the interaction between technological innovation, organizational readiness, governance requirements, and Shariah-based institutional values. More specifically, this framework is constructed through four interconnected phases, namely Shariah & Legal Vetting, Architectural Selection & Operational Synergy, Impact-Driven Distribution & Empowerment, and Governance & Continuous Auditing. Each phase represents a critical layer of institutional adaptation, beginning with legal and ethical validation, followed by the strategic alignment of technological architecture with operational needs, the translation of digital capabilities into measurable social impact, and the establishment of continuous governance, security, and accountability mechanisms. Importantly, these phases do not operate in isolation, but are embedded within a dynamic interaction among external environmental pressures, human capacity development, organizational maturity evaluation, and the ongoing creation of strategic value for zakat institutions. To illustrate this conceptual synthesis more systematically and to clarify the recursive relationships among these dimensions, Figure 3 presents the Integrated Shariah-Compliant Cloud Transition Framework for Zakat Institutions.

Source: designed by author (2026)

Figure 3. Integrated Shariah-Compliant Cloud Transition Framework for Zakat Institutions

As illustrated in Figure 3, strategic adaptation in zakat institutions operates through an interconnected cycle, rather than through linear stages that end once technology has been successfully implemented. First, this process begins with the external environment, namely regulatory changes, economic dynamics, technological developments in the era of Industry 4.0, as well as shifts in the social needs of society. These external factors create both pressures and opportunities that encourage zakat institutions to undertake institutional adjustments. In this context, digital transformation emerges not merely because of technological modernization, but from the need to maintain institutional relevance, improve service quality, strengthen transparency, and respond to increasingly higher public demands for accountability in the management of religious social funds.

Second, these pressures are subsequently translated into the human enabler dimension, which emphasizes that technological change cannot take place without the readiness of human resources. In this regard, referring to the Human Resource Management model developed by Aznan Hasan, such readiness is built through the cycle of recruitment, selection, performance appraisal, training and development, as well as compensation.[49] At this stage, zakat institutions not only require *amil* who possess technical capabilities, but also individuals who understand the values of *amanah*, social responsibility, and service orientation. Recruitment becomes the starting point for identifying suitable talent, selection ensures competency alignment, performance appraisal measures the ability to adapt to change, training strengthens digital capacity, while the compensation system maintains motivation and performance sustainability. Therefore, digital transformation in zakat institutions fundamentally begins with human transformation.

Third, once organizational readiness has been established, the process advances to the core of transformation, namely the Shariah-Compliant Cloud Transition Framework. At this phase, the transition toward cloud computing is carried out through four interconnected stages. The first stage, Shariah & Legal Vetting, focuses on legal evaluation, regulatory compliance, and the alignment of cloud services with Sharia principles, particularly those related to data sovereignty and the protection of sensitive information. The second stage, Architectural Selection & Operational Synergy, emphasizes the selection of the most appropriate cloud architecture, particularly the hybrid cloud model, so that institutions can achieve operational flexibility without losing control over confidential zakat data. The third stage, Impact-Driven Distribution & Empowerment, demonstrates how technology begins to be translated into tangible social impact through data synchronization, predictive analytics, and more accurately targeted distribution systems. The fourth stage, Governance & Continuous Auditing, ensures that the entire digitalization process operates under strict governance control through system security, performance evaluation, technology audits, and continuous Sharia audits.

Fourth, once the system is operational, the process does not end at implementation but proceeds to the maturity evaluation stage. In this phase, the nonprofit organizational maturity model developed by Lauri Pakkala functions as an evaluation tool to assess the extent to which the organization is truly prepared and capable of sustaining the transformation in the long term. The evaluation is conducted through five main domains,

[49] Hasan et al., "A Proposed Human Resource Management Model for Zakat Institutions in Malaysia."

namely skills, FinOps, governance, security and compliance, as well as design.[50] The skills domain assesses the capability of human resources in operating and developing the system. FinOps evaluates the extent to which cloud costs can be efficiently controlled. Governance measures the quality of data-driven decision-making. Security and compliance ensure that information security and regulatory compliance remain maintained. Meanwhile, design examines whether the system architecture is sufficiently flexible to address future organizational needs. Through this evaluation, zakat institutions can identify capability gaps while simultaneously determining more realistic priorities for organizational strengthening.

Fifth, the outcomes of this entire process ultimately converge into strategic outcomes, namely the creation of operational efficiency, institutional sustainability, organizational integrity, *Sharia* compliance, increased public trust, as well as more measurable *mustahik* empowerment. These outcomes demonstrate that the success of digital transformation in zakat institutions is not measured solely by the successful implementation of technological systems, but by the ability of such technology to strengthen institutional legitimacy and expand the resulting social impact. More importantly, these strategic outcomes do not represent the endpoint of the process. On the contrary, the outcomes achieved will continuously interact with the external environment, generating new needs, new challenges, and new opportunities that require further adaptation. This is what makes the overall model in Figure 3 operate as a *continuous adaptation loop*, namely a cycle of institutional learning that continuously evolves through the interaction between environmental change, human capacity strengthening, technological implementation, organizational maturity evaluation, and the creation of social impact. Within this framework, cloud computing is no longer understood as the final objective of transformation, but rather as a strategic medium for sustaining the continuity, integrity, and relevance of zakat institutions amid continuously evolving social and technological change.

Discussion

Reconfiguring Cloud Architecture within Shariah-Based Institutional Logics

Migration toward cloud computing in zakat institutions does not begin with technology. It begins with legitimacy. The most significant contribution of Figure 3 does not lie in its ability to demonstrate that zakat institutions can adopt cloud technology, since such a proposition no longer presents theoretical novelty. Its actual contribution lies in its ability to demonstrate that within institutions operating under Sharia-based institutional logics, cloud adoption ceases to be merely a technological issue and becomes a matter of institutional legitimacy. What emerges from the proposed framework is a fundamental shift: digital transformation is no longer understood as a managerial project driven solely by efficiency, but as an ongoing process of negotiation among multiple overlapping institutional logics—between technological scalability and data sovereignty, between managerial flexibility and religious accountability, as well as between organizational innovation and moral responsibility.

[50] Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

The first finding that emerges from Figure 3 concerns the position of the external environment as the primary trigger of institutional transformation. Regulatory changes, economic volatility, the rapid expansion of technologies in the industry 4.0 era, as well as rising social expectations collectively create pressures that make organizational stagnation no longer sustainable. However, these pressures do not operate merely as market signals or operational disruptions. Within zakat institutions, such pressures function as mechanisms of institutional scrutiny that compel organizations to demonstrate not only efficiency, but also transparency, responsiveness, and religious integrity. This finding reinforces the institutional perspective that views organizational change as a process driven by the pursuit of legitimacy, rather than merely the pursuit of efficiency.[51] Within zakat administration, such legitimacy is not monopolized solely by the state or civil society. It is simultaneously mediated by religious authorities, Sharia advisory structures, and the moral expectations of Muslim communities. Therefore, it is not surprising that the model proposed in this study positions environmental pressure as the starting point of the cycle, because within Sharia-based institutions, transformation begins when existing administrative structures are no longer capable of meeting continuously evolving boundaries of legitimacy.

However, institutional pressure alone does not automatically produce transformation. The model we propose demonstrates that adaptation becomes possible only when organizational capacity is reconstructed through human beings as the primary drivers of change. By integrating the Human Resource Management model developed by Aznan Hasan, this finding demonstrates that recruitment, selection, performance appraisal, training and development, as well as compensation cannot be understood merely as routine administrative mechanisms.[52] Collectively, these elements function as institutional instruments for reproducing the competencies required to sustain digital transformation. The significance of this finding lies in the repositioning of amil, from merely administrative executors to institutional intermediaries operating at the intersection of religious ethics and technological systems. Recruitment functions to identify individuals who can navigate both worlds; training builds digital literacy without disconnecting normative commitments; performance evaluation measures not only technical productivity, but also adaptive capacity; while compensation sustains organizational commitment amid structural change. Cloud transformation, in this sense, is always preceded by the construction of what may be called a *human architecture*. Without it, digital infrastructure may function technically yet remain institutionally fragile.

The next finding demonstrates that the selection of hybrid cloud architecture cannot be understood merely as a technological compromise between flexibility and control. Within zakat institutions, it emerges as a form of institutional buffering. Public cloud services offer scalability, mobility, collaboration, and cost efficiency—characteristics that are increasingly important in the management of donor CRM, operational synchronization, and real-time analytics. At the same time, however,

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[51] Karl Gabriel, "Organisation Und Legitimation / Organization and Legitimization: Die Selbststeuerungsimperative Der Organisation Und das Problem Der Legitimation / The Requirements of Organizational Self-Regulation and the Problem of Legitimization," *Zeitschrift Für Soziologie* 3, no. 4 (1974): 339–355; Dana Landau et al., "Multiple Legitimacy Narratives and Planned Organizational Change," *Human Relations* 67, no. 11 (2014): 1321–1345.

[52] Hasan et al., "A Proposed Human Resource Management Model for Zakat Institutions in Malaysia."

financial records, donor identities, and *mustahik* databases carry institutional sensitivities that extend far beyond conventional cybersecurity concerns. Such data constitute repositories of trust, social vulnerability, and religious obligation. Figure 3 demonstrates that hybrid architecture becomes strategically compelling because it enables organizations to embrace digital innovation without losing control over assets that are morally highly sensitive. This finding suggests that architectural decisions within Sharia-based institutions are never entirely technical. They are always juridical, ethical, and political—namely, decisions about how organizations negotiate the boundaries between openness and protection, innovation and preservation, efficiency and *amanah*.

Equally important is the role of organizational maturity, which is analyzed through the integration of the maturity model framework developed by Lauri Pakkala.[53] Figure 3 demonstrates that the success of cloud adoption cannot be reduced merely to the successful implementation of a system. Digital transformation acquires meaning only when an organization is capable of continuously evaluating its internal readiness across multiple dimensions. The skills domain demonstrates that technological systems consistently evolve more rapidly than organizational competencies, making continuous learning a structural necessity. The FinOps domain introduces a dimension that is often overlooked in the digitalization of nonprofit organizations, namely the possibility that technological flexibility, if not financially controlled, may instead generate new forms of institutional vulnerability. The governance domain reflects a deeper shift, from intuition-based administration toward evidence-based decision-making. Meanwhile, the security and compliance domain demonstrates that data protection in zakat institutions possesses a dual character: as a regulatory obligation and as a religious imperative. The design domain shows that resilient organizations are not those with the most sophisticated systems, but those capable of building architectures that are modular, adaptive, and able to evolve according to contextual demands. Taken together, these domains demonstrate that digital maturity in zakat institutions is more appropriately understood as a form of continuous institutional discipline rather than a technical objective that is achieved once and for all.

Perhaps the most compelling finding emerging from Figure 3 lies in the strategic outcomes it generates. Unlike the dominant narratives in the cloud adoption literature, the most important value that emerges here does not stop at operational efficiency or cost reduction. What becomes more prominent instead is the strengthening of institutional integrity, the enhancement of Sharia compliance, the growth of public trust, and the increasingly measurable empowerment of *mustahik*. This finding demonstrates that within Islamic philanthropic institutions, technology acquires legitimacy not because of its ability to accelerate processes, but because of its ability to strengthen the moral capacity of institutions in carrying out their social mission. Efficiency remains important, yet efficiency without trust is institutionally hollow. Scalability is equally important, yet scalability without justice may instead weaken the legitimacy that has long sustained the existence of zakat institutions.

Ultimately, the cyclical structure presented in Figure 3 challenges the assumption that cloud migration ends once implementation has been completed. Instead, this model

[53] Pakkala, "Measuring Capability for Cloud Infrastructure Adoption in Software Production for Finnish Non-Profit Organisations."

demonstrates a recursive institutional logic, in which every strategic outcome generates new environmental pressures, new organizational questions, and new governance requirements. Regulations continue to evolve, technological possibilities continue to expand, donor expectations continue to change, and social vulnerabilities continue to transform. Under such conditions, digital transformation can never be treated as a completed project. It becomes a continuous cycle of technological learning, institutional auditing, human development, and Sharia calibration. What Figure 3 ultimately demonstrates is that the reconfiguration of cloud architecture in zakat institutions is not merely an effort to digitalize religious administration, but rather a process of redesigning institutional infrastructure so that technological innovation remains consistently subject to the ethical, juridical, and social logics that have long served as the source of legitimacy within Islamic philanthropy.

Cloud Transition as a Socio-Institutional and Iterative Transformation Process

If cloud migration within zakat institutions initially appears as a technological response to the demands of digital modernization, the findings of this study suggest a far more consequential transformation. What is ultimately being reshaped is not merely operational infrastructure, but the institutional foundations through which authority, accountability, and organizational sustainability are continuously produced. Cloud transition, in this context, should therefore be understood not as a technical intervention, but as a socio-institutional transformation in which digital systems become embedded within broader structures of religious governance, professional responsibility, and public trust. The first implication of this transformation concerns the reconfiguration of organizational governance. The integration of cloud-based systems gradually shifts zakat management away from administrative structures that rely heavily on procedural routines and centralized decision-making toward governance models that are more adaptive, data-driven, and distributed. Real-time access to operational information, integrated donor databases, predictive analytics, and digital auditing mechanisms create conditions in which organizational decisions can no longer depend solely on managerial intuition or hierarchical authority. Instead, governance increasingly becomes an ongoing process of evidence-based coordination, collective accountability, and continuous institutional adjustment. This shift carries important implications for zakat institutions, as legitimacy is no longer maintained only through compliance with formal regulations or religious norms, but also through the institution's ability to demonstrate measurable transparency, responsiveness, and strategic consistency.

A second implication emerges in relation to professional identity and institutional roles. As digital systems become integrated into the operational core of zakat institutions, the role of amil undergoes a significant transformation. No longer positioned merely as administrators of collection and distribution, amil increasingly function as digital stewards who operate at the intersection of technological competence, ethical responsibility, and social mediation. Their responsibilities extend beyond managing transactions or verifying beneficiaries; they are now expected to interpret data, safeguard sensitive information, facilitate digital interactions with donors, and ensure that technological decisions remain aligned with institutional values. This transformation suggests that digitalization within faith-based organizations does not simply demand

new technical skills. It produces new professional identities, new ethical obligations, and new forms of institutional authority.

The third and perhaps most far-reaching implication concerns institutional sustainability. Within conventional digital transformation discourse, sustainability is often associated with operational efficiency, scalability, or cost optimization. The findings of this study point toward a different reality. Within zakat institutions, long-term sustainability increasingly depends on organizational resilience, public legitimacy, and the ability to continuously learn from changing social, regulatory, and technological environments. Technological systems, no matter how sophisticated, do not guarantee institutional continuity unless they are supported by mechanisms of ongoing evaluation, adaptive governance, ethical oversight, and organizational learning. Sustainability, therefore, is no longer measured solely by growth in zakat collection or operational expansion, but by the institution's ability to preserve trust while continuously recalibrating its structures in response to emerging challenges. Taken together, these implications suggest that cloud transition within zakat institutions should no longer be interpreted as a finite modernization project. It represents an ongoing institutional journey in which technology, human agency, religious stewardship, and social accountability evolve together. The significance of digital transformation, therefore, lies not in the speed with which new systems are adopted, but in the institution's capacity to ensure that innovation remains permanently accountable to the ethical and social purposes that define its existence.

Conclusion

This study demonstrates that the adoption of cloud computing within zakat institutions cannot be reduced to a mere technological upgrade or an administrative modernization initiative. Rather, it represents a multidimensional institutional transformation in which technological infrastructure, human resource capacity, governance mechanisms, financial control, data security, and Shariah compliance operate as mutually constitutive elements. The findings reveal that cloud computing—particularly when implemented through hybrid architecture, integrated SaaS platforms, data analytics, and maturity-based organizational evaluation—has the potential to significantly enhance operational efficiency, cross-institutional data synchronization, donor engagement, distribution accuracy, and institutional resilience. More importantly, the proposed integrated shariah-compliant cloud transition framework shows that successful digital transformation within zakat institutions depends not solely on technological readiness, but on the institution's ability to continuously align digital innovation with human capacity development, evidence-based governance, ethical accountability, and the preservation of public trust.

The contribution of this study lies in extending mainstream cloud adoption discourse beyond efficiency-oriented and corporate-centered perspectives by positioning cloud transition within the socio-institutional logics of Islamic philanthropy. By integrating cloud computing architecture, human resource management, and nonprofit maturity evaluation into a single conceptual framework, this study offers an alternative analytical model for understanding digital transformation in faith-based institutions. Nevertheless, this article remains conceptual in nature and therefore has not yet been empirically tested within operational zakat institutions across different regulatory or

organizational contexts. Future research should therefore empirically validate the proposed framework through comparative case studies, mixed-method approaches, or longitudinal investigations involving zakat institutions across different jurisdictions, institutional scales, and governance environments; to further examine how technological adaptation interacts with organizational culture, Shariah governance, and long-term social impact in practice.

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