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Improving zakat management with QRIS: A system thinking approach to boost financial literacy and inclusion

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ABSTRAK

Introduction

Zakat management in Indonesia faces operational inefficiencies, low digital adoption, and limited financial inclusion, especially in underserved areas. The introduction of QRIS (Quick Response Code Indonesian Standard) as a digital payment system presents an opportunity to improve zakat collection, transparency, and accessibility. However, systemic barriers such as low zakat literacy, limited trust, infrastructure gaps, and regulatory challenges hinder optimal adoption.

Objectives

This study aims to analyze the systemic factors influencing QRIS adoption in zakat management. It investigates how variables such as zakat literacy, digital literacy, user trust, infrastructure, and policies interact to affect digital zakat ecosystems in Indonesia.

Method

The research employs a System Thinking approach, utilizing qualitative methods including expert interviews, document analysis, and literature triangulation. A Causal Loop Diagram (CLD) is developed to map feedback loops among macro, micro, interface, and policy-level

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factors, enabling identification of leverage points for strategic interventions.

Results

Findings reveal that increasing zakat and digital literacy significantly enhances user trust and QRIS adoption, forming a reinforcing feedback loop. However, high transaction costs and inadequate infrastructure create balancing loops that impede adoption. Comparative insights from Malaysia, Pakistan, and Gulf countries support the importance of Shariah compliance and regulatory clarity in building trust.

Implications

This study highlights the need for integrated strategies combining financial and digital literacy programs, regulatory reforms, and infrastructure investments to promote equitable and sustainable digital zakat systems in Indonesia. It offers actionable insights for policymakers, Islamic financial institutions, and zakat organizations.

Originality/Novelty

This study contributes to the limited literature on digital zakat management by applying a System Thinking approach—an analytical method rarely used in Islamic finance. Using a Causal Loop Diagram (CLD), it visualizes dynamic interconnections and feedback loops between trust, cost, infrastructure, and Shariah legitimacy. This feedback-based framework offers a more holistic view than conventional linear models such as TAM or UTAUT, providing practical insights for improving Sharia-compliant financial inclusion.

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INTRODUCTION

Zakat, a core pillar of Islamic economic principles, functions as a redistributive mechanism that alleviates poverty and promotes social equity. In Indonesia, where the Muslim population is the largest globally, the potential of zakat to contribute to national development remains underutilized due to inefficiencies in its management system (Alkhayyal & Parveen, 2024; Bin-Nashwan et al., 2023). Conventional zakat collection methods in Indonesia are often plagued by high administrative costs, lack of digital traceability, and logistical inefficiencies. For instance, a report by Badan Amil Zakat Nasional (2024) revealed that over 30% of zakat institutions still rely on manual record-keeping and cash-based transactions, leading to low traceability and potential leakage. These challenges are further amplified in rural and underserved areas where digital infrastructure is limited and awareness of institutional zakat is low (Fitriani et al., 2024; Wahyuni & Hermawan, 2022).

To address these challenges, digital payment innovations such as the Quick Response Code Indonesian Standard (QRIS) have been introduced to enhance efficiency, accountability, and reach in financial transactions (Ciptowati & Setiawan, 2024; Tricahyono et al., 2024). While QRIS has shown promising adoption in the commercial sector, its integration into zakat management remains underexplored both in practice and academic literature. Existing studies on QRIS adoption have primarily used behavioral frameworks such as TAM or UTAUT to explore factors like perceived usefulness, ease of use, and user intention (Fitria et al., 2024; Nabila & Putri, 2024). However, these models are limited in scope—they emphasize individual decision-making but fail to capture broader systemic variables such as infrastructure readiness, religious compliance, or regulatory dynamics. Very few studies have applied System Thinking or other systemic modeling frameworks to analyze zakat digitalization holistically (Fadillah et al., 2022; Setiawan et al., 2024).

In addition, the momentum for digital finance integration is accelerating regionally. In a significant development, Bank Indonesia (BI) announced that starting August 17, 2025—coinciding with Indonesia's 80th Independence Day—Indonesian travelers will be able to use QRIS for transactions in Japan. This follows successful sandbox trials initiated in mid-May 2025 with Japanese payment authorities. BI is also finalizing cross-border QRIS collaborations with China through UnionPay International and four Indonesian payment service providers, and is engaging in technical discussions with India's NPCI International. Previously, cross-border QRIS implementations have been established with Malaysia, Thailand, and Singapore, and are now being expanded to include Japan, China, India, Saudi Arabia, and South Korea (Chusaeni et al., 2024). Despite these advancements, the systemic integration of QRIS for religious financial services like zakat remains insufficiently addressed—both empirically and conceptually.

This study aims to analyze the systemic factors influencing QRIS adoption in zakat management using a System Thinking approach. By mapping the interrelations between zakat literacy, digital literacy, user trust, infrastructure, and regulatory factors through a Causal Loop Diagram (CLD), this research seeks to identify leverage points for creating a more inclusive, efficient, and Sharia-compliant zakat ecosystem.

System Thinking is particularly suitable for exploring complex, multi-variable problems like digital zakat adoption, where trust, infrastructure, regulation, and religious legitimacy intersect. Unlike linear models, System Thinking captures dynamic complexities, delays, and non-obvious interactions that influence outcomes. In the context of digital zakat management, this approach enables the identification of leverage points where small changes can yield systemic improvements. Applying System Thinking to QRIS adoption allows researchers to move beyond individual user behaviors (as seen in TAM or UTAUT) and instead explore how structural barriers—such as infrastructure gaps, policy delays, and trust erosion—collectively shape the digital zakat ecosystem (Setiawan et al., 2024).

This study provides a novel analytical lens by integrating System Thinking—a methodology seldom applied in Islamic finance—into the analysis of QRIS-based zakat management. By using a Causal Loop Diagram (CLD), the research captures feedback

loops and systemic barriers often overlooked by linear adoption models such as TAM or UTAUT. It expands the literature by connecting technological, religious, and behavioral dimensions through a feedback-driven model. This approach enables a more holistic understanding of the interconnected challenges and leverage points in building a Sharia-compliant digital zakat ecosystem (Bin-Nashwan et al., 2023).

LITERATURE REVIEW

Zakat Management in the Digital Era

Zakat is a foundational pillar of the Islamic economic system, serving as a redistributive mechanism to promote social justice, alleviate poverty, and support sustainable development (Danila et al., 2024; Yuwana et al., 2024). In Indonesia—one of the world's most populous Muslim-majority country—zakat has immense potential to support national development. However, its impact remains limited due to traditional operational inefficiencies such as high administrative costs, limited access in rural areas, and lack of integration with digital financial systems (Alfadri et al., 2024; Bin-Nashwan et al., 2023).

Manual processes like paper-based donor records and offline disbursements continue to dominate many zakat institutions, leading to low transparency and weak accountability (Canggih et al., 2017). In response, digital innovations such as the Quick Response Code Indonesian Standard (QRIS) have been proposed to improve efficiency, traceability, and inclusivity in zakat collection and distribution (Ciptowati & Setiawan, 2024; Fitria et al., 2024). This signals a growing shift toward framing zakat not only as a religious obligation but also as a driver of fintech-enabled social transformation.

In parallel, other Muslim-majority countries have pursued digital zakat innovations. In Malaysia, blockchain-based zakat systems have shown promise in improving donor trust and transparency (Nazeri et al., 2023). In the Gulf, digital zakat platforms are more centralized and state-driven, integrated into national payment systems. These global developments emphasize that successful digital zakat transformation must align technological innovation with religious legitimacy and institutional capacity.

Technology Adoption Models: TAM and UTAUT

The Technology Acceptance Model (TAM), developed by Davis (1989), posits that perceived usefulness and perceived ease of use are the main predictors of a user's intention to adopt a new technology (Alsyouf et al., 2023; Silva, 2015; Tubaishat, 2018; Wu & Chen, 2017). If users believe a technology enhances their performance and is easy to use, adoption is more likely. This model has been widely applied in digital finance studies, including QRIS adoption.

Building on TAM, the Unified Theory of Acceptance and Use of Technology (UTAUT), introduced by Venkatesh et al. (2003), incorporates additional determinants such as social influence, facilitating conditions, and user experience (Chakraborty & Al Rashdi, 2015; Dwivedi et al., 2019; Jahanshahi et al., 2020; Zhou et al., 2019). In the context of QRIS adoption for zakat payments, these models have been applied in previous studies to analyze user behavior (Afandi, 2023; Ciptowati & Setiawan, 2024; Kulsum & Riza, 2024;

Munif & Darwanto, 2024). Several studies confirm that digital literacy, peer influence, and platform accessibility are crucial adoption drivers (Fitria et al., 2024; Nabila & Putri, 2024; Yuwana et al., 2024).

Importantly, in Islamic finance, behavioral intention is shaped not only by perceived utility but also by religious dimensions. Shariah compliance, institutional trust, and the perceived ability of digital platforms to fulfill religious obligations significantly influence technology acceptance among Muslim users (Aulia & Pimada, 2023; Rakhmawati & Rizky, 2023; Ramadania & Shauki, 2023). Thus, models like TAM and UTAUT offer a foundational framework, but they must be complemented by context-specific variables to fully capture the adoption dynamics in zakat management.

QRIS in Indonesia's Digital Financial Landscape

The Quick Response Code Indonesian Standard (QRIS) is a national standardized QR code system launched by Bank Indonesia to unify various digital payment platforms and facilitate seamless, cashless transactions across sectors (Prawitasari et al., 2024). Its widespread adoption in retail, transportation, and tourism reflects its role as a driver of financial inclusion and operational efficiency (Rachman et al., 2024). Notably, beginning August 17, 2025, QRIS will be available for use by Indonesian travelers in Japan, following successful pilot trials. Bank Indonesia is also finalizing cross-border payment interoperability with China (via UnionPay International), India (via NPCI International), as well as existing collaborations with Malaysia, Thailand, Singapore, Saudi Arabia, and South Korea (Utami & Uli, 2025).

However, despite these technological milestones, the integration of QRIS into zakat management remains limited. Many zakat institutions continue to rely on manual processes, fragmented data systems, and offline verification methods—challenges that hinder the transparency, efficiency, and scalability of zakat distribution (Yasin et al., 2024). Moreover, low levels of digital literacy among both amil (zakat managers) and muzakki (zakat payers) further inhibit the effective adoption of QRIS in this sector.

These conditions highlight the necessity of viewing QRIS not merely as a technical innovation but as part of a broader socio-religious and infrastructural system. Understanding the systemic enablers and barriers to QRIS adoption in zakat management is crucial for designing inclusive, Shariah-compliant, and digitally integrated zakat ecosystems.

Previous Studies on QRIS Adoption and Zakat Management

Prior research on QRIS adoption has largely concentrated on its application within the commercial and retail sectors, emphasizing determinants such as perceived usefulness, ease of use, and trust (Aryowiloto et al., 2024; Fauziah et al., 2024; Widyawan et al., 2024). These studies underscored that digital readiness and user-friendly interfaces significantly influence QRIS uptake among MSMEs, with literacy and infrastructure playing a pivotal role.

In the context of zakat management, however, the adoption of QRIS remains limited. Many institutions continue to rely on manual procedures—such as handwritten donor

records, fragmented databases, and delayed verification processes—that hinder transparency, accountability, and efficiency, especially in rural and underbanked regions (Yasin et al., 2024). QRIS offers potential to address these systemic issues by enabling centralized tracking, real-time logging, and geolocation mapping of zakat transactions.

Although some studies have explored digital transformation in religious giving, few have specifically analyzed QRIS within the zakat ecosystem. For example, Utami & Uli (2025) discussed the general shift toward digital financial systems but did not delve into the technical architecture or systemic implications of QRIS. Fadillah et al. (2022) illustrated how QRIS improved donor confidence and transparency, while Anwar (2023) highlighted operational benefits for religious charities. However, these studies predominantly focus on direct outcomes—such as efficiency and trust—without capturing the interplay among digital literacy, regulatory frameworks, religious behavior, and infrastructure that collectively shape adoption.

International comparative studies offer additional insights. In Malaysia, the development of MyZakat and blockchain-based zakat platforms has enhanced transparency and donor trust through state-level religious oversight (Nazeri et al., 2023). In Pakistan, the Ehsaas program demonstrates the effective integration of digital identity verification and direct transfers to optimize zakat disbursement (Maulida & Purnomo, 2023). Similarly, Gulf countries such as Saudi Arabia and the UAE have implemented zakat collection through centralized digital payment systems, albeit within more top-down administrative models (Raza et al., 2025).

During the COVID-19 pandemic, Bin-Nashwan et al. (2023) found that ZakaTech adoption in Saudi Arabia and Egypt was shaped by social influence, religiosity, and trust—factors that closely parallel Indonesia's context. These international cases underscore that successful digitalization of zakat requires systemic alignment across technological, institutional, and religious dimensions.

Despite growing adoption of QRIS in commercial sectors, its role in enhancing zakat—particularly in a cross-border context—remains underexplored. As QRIS expands internationally (e.g., in Japan, China, and India), its potential to facilitate seamless, Sharia-compliant transactions for global zakat contributions becomes increasingly relevant (Nabila & Putri, 2024). Yet, current literature lacks frameworks that assess such cross-border applications within zakat systems.

To address these research gaps, the present study adopts a System Thinking approach that goes beyond linear models like TAM and UTAUT. By employing a Causal Loop Diagram (CLD), this study maps dynamic feedback loops and structural constraints that influence QRIS adoption in zakat. This holistic framework enables the identification of leverage points that can enhance the effectiveness, inclusivity, and transparency of digital zakat systems (Sugeng et al., 2024).

Research Gap and Justification for a System Thinking Approach

While numerous studies have explored the adoption of QRIS in commercial and retail settings, the application of this digital tool within the context of zakat management

remains underdeveloped. Most existing literature focuses on isolated adoption variables—such as perceived trust, ease of use, or usability—without considering the broader systemic interactions among these variables (Kamal et al., 2024). Furthermore, the emerging cross-border functionality of QRIS—recently implemented in countries such as Japan, and soon in China and India—has not been sufficiently analyzed in relation to its potential role in facilitating global zakat contributions (Azwar & Nasir, 2025).

Existing frameworks like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) offer useful insights at the individual user level but often fall short in capturing the complex, feedback-driven nature of digital zakat ecosystems. These models rarely account for the interplay between digital and zakat literacy, infrastructural equity, trust, and religious legitimacy—all of which are essential for adoption in Islamic finance (Ariyani et al., 2024).

To address this gap, this study employs a System Thinking approach, specifically using a Causal Loop Diagram (CLD) (Brereton & Jagals, 2021; Roxas et al., 2019; Veldhuis et al., 2025) to visualize and analyze the dynamic interconnections between literacy, infrastructure, trust, regulatory policy, and religious norms. This approach enables the identification of leverage points—critical areas where targeted interventions can trigger broad, system-wide improvements—thereby complementing and extending conventional adoption models (Sarasi et al., 2021).

Contribution of This Study

This research contributes to the growing body of knowledge in Islamic digital finance by introducing a holistic, system-oriented framework to understand QRIS adoption in zakat management. While previous studies have drawn from models like TAM and UTAUT to assess user acceptance, this study enriches the analysis by integrating these models with System Thinking, thereby addressing both behavioral and structural determinants of adoption.

Through this integrated approach, the study captures complex feedback loops, structural delays, and policy resistance—elements often overlooked by linear models, as introduced by Peter Senge in 2006 (as cited in (Akpan, 2025; Lane & Sterman, 2011). It recognizes that digital zakat adoption in Indonesia is shaped not only by technical usability but also by deeper layers of Shariah compliance, institutional trust, digital infrastructure, and equitable access (Setiawan et al., 2024).

Utilizing a Causal Loop Diagram (CLD) allows the research to visually map reinforcing and balancing loops that influence the effectiveness, sustainability, and inclusivity of digital zakat systems (Yulianti et al., 2021). This perspective is particularly valuable in contexts where religious legitimacy and socio-cultural acceptance play critical roles alongside technological innovation.

Moreover, the study situates Indonesia's QRIS initiative within a broader international landscape, drawing comparative lessons from Malaysia, the Gulf, Pakistan, and Egypt. These cases demonstrate that successful digital zakat

management requires alignment between technological advancement, institutional readiness, and religious authority (Bin-Nashwan et al., 2023; Muflih, 2023; Nazeri et al., 2023).

Finally, the research highlights the strategic relevance of QRIS not just as a national innovation but also as a potential tool for cross-border Shariah-compliant financial inclusion. The findings are expected to inform policymakers, Islamic financial institutions, and zakat organizations in developing integrated, systemic strategies that foster equitable and sustainable digital zakat ecosystems (Muda et al., 2024).

METHOD

Research Design

This study adopts a qualitative research design grounded in a System Thinking approach to explore the systemic factors influencing QRIS adoption in zakat management. The primary analytical tool employed is the Causal Loop Diagram (CLD), which maps dynamic interactions among variables such as zakat literacy, digital literacy, transaction costs, infrastructure availability, and regulatory compliance. System Thinking, originally conceptualized by Forrester (1961), and further advanced in more recent applications, enables a holistic understanding of complex systems by identifying reinforcing and balancing feedback loops (Azar, 2012; Farras et al., 2022; Lich et al., 2017; Richardson, 2011).

This approach was chosen because it captures non-linear relationships, structural delays, and policy resistance—factors often overlooked by linear adoption models such as TAM and UTAUT. In value-laden systems like zakat, where religious compliance, institutional trust, and socio-technical infrastructure are deeply interdependent, System Thinking provides a more comprehensive analytical lens (Santi & Chalid, 2024).

Sampling and Participant Selection

Participants were selected through purposive sampling to ensure expertise and relevance to the research focus. The study involved five experts representing diverse perspectives, including Islamic economics, digital transformation in Islamic banking, zakat institutions, and financial technology. These experts were chosen based on their professional background and involvement in digital finance, zakat management, and regulatory frameworks. This sampling strategy ensured the inclusion of both academic insights and practical experiences, thereby enriching the depth of analysis. The participants' profiles are summarized in Table 1 .

The expert participants in this study represent diverse professional backgrounds, age ranges (28–42 years), and varying levels of experience (5–15 years), ensuring a comprehensive understanding of the systemic factors affecting QRIS adoption in zakat management. The participants include senior academics in Islamic economics, digital finance consultants. The participants include senior academics in Islamic economics, digital finance consultants, Sharia bank risk managers, operational managers of zakat institutions, and fintech founders. Their expertise spans digital finance, zakat operations, and regulatory frameworks, providing a rich mix of perspectives that enhances the

credibility and depth of the analysis. The diversity in positions and experience levels allows the study to capture insights from strategic, operational, and grassroots levels, ensuring that the resulting system model is both theoretically sound and practically grounded.

Table 1

Profile of Participants in the Study

Participant	Age	Gender	Position	Years of Experience	Expertise
1	40	Male	Senior academic in Islamic economics and finance (public university)	12+	Zakat management, Islamic finance, system modeling
2	35	Male	Digital finance consultant	10	Fintech, QRIS implementation, regulatory compliance
3	42	Male	Senior manager, credit risk division (Sharia bank)	15	Risk management, banking operations, digital payment integration
4	30	Male	Operational manager at zakat institution	7	Zakat distribution, community engagement, digital payment
5	28	Male	Founder of Sharia fintech startup	5	Digital zakat solutions, QRIS adoption, Sharia-compliant fintech

Source: Primary data.

Experts were selected based on their institutional roles and practical experience in digital zakat implementation and policy development (minimum 5 years). Data triangulation was applied by cross-verifying interview findings with government-issued QRIS reports and BAZNAS guidelines (Fadillah et al., 2022; Fitriani et al., 2024). While this study focused on expert insights to model systemic dynamics using CLD, it recognizes the absence of primary data from muzakki (donors) and mustahik (recipients) as a limitation. Their perspectives are essential to understand behavioral barriers, emotional trust, and socio-religious motivations that influence QRIS adoption. Future studies should adopt a mixed-methods approach by integrating survey or ethnographic interviews with grassroots zakat stakeholders to complement the systemic model. This inclusion will enhance the model's contextual richness and practical relevance, especially in underserved rural communities.

To operationalize the CLD construction, a series of semi-structured expert interviews was conducted. Five experts were interviewed, representing diverse backgrounds such as Islamic economics academia, zakat institution operations, digital financial consultancy, and fintech entrepreneurship. Participants were selected through purposive sampling based on their institutional roles and expertise in QRIS implementation and digital zakat systems, with a minimum of five years of professional experience. Each interview lasted between 45 to 60 minutes and covered core themes

including: existing practices in zakat payment and distribution, adoption challenges and opportunities of QRIS in zakat, literacy, trust, cost, infrastructure, and policy dynamics, and perceived feedback loops in digital zakat ecosystems.

The qualitative data were thematically analyzed to extract key variables and causal linkages. These were iteratively structured into a preliminary Causal Loop Diagram (CLD). The initial model was then validated and refined using triangulation with institutional documents (e.g., QRIS implementation reports from Bank Indonesia and BAZNAS guidelines), ensuring both theoretical robustness and real-world relevance. This methodological flow facilitated a systemic understanding of QRIS adoption in zakat management through expert input and document-based validation.

Data Collection and CLD Operationalization

To operationalize the construction of the Causal Loop Diagram (CLD), this study conducted a series of semi-structured expert interviews. Five experts were selected through purposive sampling, representing diverse domains including Islamic economics academia, zakat institution operations, digital financial consultancy, and fintech entrepreneurship. Each expert had a minimum of five years of professional experience related to QRIS implementation or digital zakat systems. This purposive sampling method was chosen to ensure that participants possessed practical and institutional insights necessary for system modeling. While not aiming for generalizability, this approach provides rich, experience-based data appropriate for qualitative system thinking analysis.

Interviews lasted between 45 to 60 minutes and explored themes such as current zakat payment practices, adoption challenges and opportunities of QRIS, literacy and trust issues, transaction costs, infrastructural constraints, policy frameworks, and perceived feedback loops in digital zakat ecosystems. The qualitative data were thematically analyzed to identify key variables and causal relationships, which were then structured into a preliminary CLD.

To ensure validity and real-world relevance, the model was refined through triangulation with institutional documents, including QRIS reports issued by Bank Indonesia and operational guidelines from BAZNAS (Fitriani et al., 2024). Insights from Silalahi et al. (2023), which examine the roles of digital literacy and trust in QRIS adoption for Islamic financial services, and Syed Yusuf et al. (2024), which assess governance structures and digital readiness of zakat institutions across ASEAN, were also used to strengthen the contextual relevance of the model.

While expert input was central to modeling systemic dynamics, the absence of primary data from muzakki (donors) and mustahik (recipients) is acknowledged as a limitation. Their perspectives—particularly on behavioral barriers, emotional trust, and religious motivations—are essential for a more holistic understanding. Future research should adopt mixed-methods approaches, such as surveys or ethnographic interviews with grassroots zakat stakeholders, to enhance the model's contextual richness and applicability in rural or underserved communities

The responses from expert interviews were categorized into themes and aligned with variables in the Causal Loop Diagram (CLD). This triangulation process ensured that participant insights were systematically mapped to the core systemic factors identified in the study. These themes were not only extracted qualitatively but also validated through triangulation with institutional references. A summary of the mapped responses is presented in Table 2.

Table 2

Expert Questionnaire Responses and Triangulation Analysis

Question	Response Summary	Linked Variable in CLD	CLD Variable Type
How would you assess the understanding of zakat obligations and the importance of zakat literacy in society today?	Awareness of zakat obligations was widespread, but deeper literacy on its management and social benefits was needed.	Zakat Literacy	Micro
How likely are people to use QRIS for zakat payments if they fully understand its benefits?	Greater understanding of QRIS benefits was likely to increase adoption significantly.	Perceived Trust in QRIS	Interface (QRIS Adoption)
To what extent does digital literacy influence people's willingness to use QRIS for zakat payments?	Strong agreement that digital literacy was a key factor in motivating QRIS adoption.	Digital Literacy	Micro
What are the main barriers in society to adopting QRIS for zakat payments?	High transaction costs, lack of digital literacy, and limited infrastructure were major obstacles.	Transaction Costs, Technological Infrastructure	Macro
How effective are training programs on zakat and digital literacy in encouraging QRIS adoption in the community?	Training programs on zakat and digital literacy were highly effective in promoting QRIS adoption and fostering community engagement.	Zakat Literacy, Digital Literacy	Micro

Source: Primary data. Primary data.

As illustrated in Table 2, the expert responses reflect critical leverage points such as literacy, infrastructure, and trust, which shape the adoption of QRIS in zakat systems. These variables were then synthesized and interlinked to form the Causal Loop Diagram (CLD), enabling a systems-level analysis of the feedback mechanisms influencing digital zakat adoption. The following section presents the construction and interpretation of this diagram.

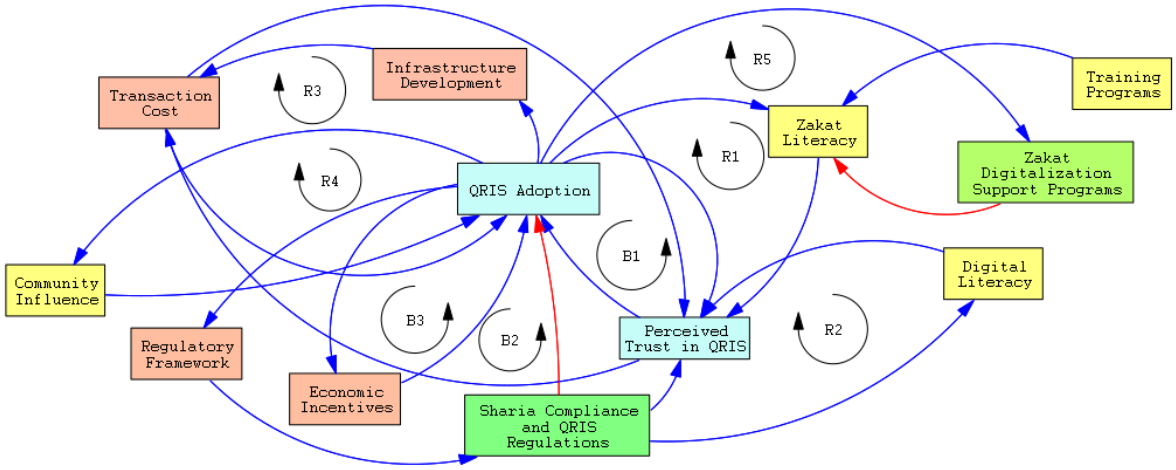
Data Analysis

Thematic analysis was applied to examine both interview transcripts and secondary data, enabling the identification of key themes related to systemic factors influencing QRIS adoption. These themes were subsequently translated into a Causal Loop Diagram

(CLD) to visualize dynamic feedback loops and interconnections among variables. The analysis revealed several reinforcing loops—such as the Literacy–Trust Loop (R1), where enhanced zakat and digital literacy boost public trust and drive QRIS adoption—and balancing loops—such as the Cost–Trust Loop (B1), where improved infrastructure lowers transaction costs and strengthens trust, whereas high costs create friction that inhibits adoption. This approach is consistent with established practices in qualitative system modeling (Nasution et al., 2023). The synthesized findings are illustrated in Figure 1.

Figure 1

Causal Loop Diagram (CLD) of Systemic Interactions Influencing QRIS Adoption in Zakat Management



Source: Primary data. Primary data.

Figure 1 presents a comprehensive Causal Loop Diagram (CLD) that visualizes the systemic interactions influencing the adoption of QRIS in zakat management. The diagram is structured around four interdependent domains: macro (orange), micro (yellow), interface (green), and policy or intervention (blue). Each arrow in the diagram represents a causal relationship, where the direction and polarity (positive or negative) indicate how a change in one variable affects another. Feedback loops are labeled as reinforcing (R) or balancing (B), representing dynamic patterns that either amplify or stabilize change within the system.

The first reinforcing loop, R1 (Literacy–Trust Loop), illustrates how improvements in both zakat and digital literacy foster greater public trust in QRIS. As trust increases, adoption rates grow, which further reinforces the value of educational efforts. This loop highlights the foundational role of knowledge in accelerating digital transformation within religious financial practices. A similar pattern is observed in R2 (Digital Capacity Loop), where digital training and institutional support increase digital literacy, leading to higher adoption and further motivation for capacity building.

Infrastructure plays a critical role in loops R3 and R4. In R3 (Infrastructure–Adoption Loop), the availability of reliable digital infrastructure reduces transaction costs, thereby

encouraging broader use of QRIS. As adoption grows, so does the justification for further infrastructure investments. R4 (Transaction Cost Loop) reinforces this mechanism by showing that increased adoption leads to greater system efficiency and reduced costs over time, further bolstering public trust and sustained usage. R5 (Zakat Engagement Loop) integrates religious, social, and technological dimensions. It demonstrates how enhanced zakat literacy and institutional digitalization efforts make QRIS a more credible and attractive channel for zakat distribution. This loop not only improves adoption rates but also strengthens the perceived alignment between Islamic values and digital financial systems, reinforcing both participation and institutional legitimacy.

In contrast to the reinforcing dynamics, several balancing loops introduce system resistance. B1 (Cost–Trust Loop) shows how high transaction costs reduce public trust in QRIS, which suppresses adoption. However, investments in infrastructure can mitigate this barrier, stabilizing the system. B2 (Shariah Trust Loop) reflects the sensitive relationship between technological adoption and religious compliance. As adoption increases, scrutiny over Shariah conformity may rise; without clear religious endorsement, public trust can erode. This loop underscores the importance of transparent and consistent religious guidance. Lastly, B3 (Regulatory Constraint Loop) highlights how policy decisions—such as unclear regulations or inadequate incentives—can either slow down or support adoption. While flexible and supportive policies can drive growth, overly rigid frameworks may create hesitation among both institutions and users, thereby balancing or even reversing progress.

Taken together, this CLD presents a dynamic and interconnected view of the challenges and opportunities in QRIS-based zakat digitalization. By visualizing both reinforcing and balancing loops, it highlights how technological, religious, and institutional variables interact to shape system behavior (Kutty et al., 2020; Prahasta, 2018; Voulvoulis et al., 2022). For instance, interface variables such as Shariah compliance and regulatory clarity play a pivotal role in aligning digital innovation with Islamic principles, thereby enhancing public legitimacy and trust (Alam, 2021; Alam et al., 2021; Grimmelikhuijsen et al., 2024; Stupak et al., 2021; Wahid et al., 2022). Meanwhile, policy-level dynamics—such as QRIS adoption rates and perceived trust—serve as emergent outcomes that signal the maturity of digital zakat ecosystems and the effectiveness of institutional strategies (Sari et al., 2025). The model thus provides a non-linear roadmap for stakeholders to identify leverage points—such as educational programs, infrastructure investment, and regulatory coherence—to design inclusive, efficient, and Sharia-compliant digital financial systems aligned with Indonesia's socio-religious context.

Ethical Considerations

This study adhered to established ethical standards in qualitative research by ensuring informed consent, anonymity, and confidentiality for all participants. Prior to each interview, participants were fully briefed on the study's objectives, their voluntary role, and the nature of their contributions. It was emphasized that their participation was optional and that they could withdraw at any time without consequence. All data

collected were anonymized and securely stored, with no personal identifiers included in the analysis or publication. Participant feedback was integrated during the validation process to enhance the accuracy and trustworthiness of the findings. This study complied with ethical guidelines for social science research, following protocols outlined in (Zhang et al., 2024).

Validity and Reliability

To uphold the credibility of the research, this study employed triangulation by cross-referencing data from expert interviews with relevant literature, institutional guidelines, and government-issued policy documents. This multi-source validation strengthened the theoretical grounding and practical relevance of the findings. Member checking was conducted by sharing the preliminary Causal Loop Diagram (CLD) and synthesized insights with participants, allowing them to verify interpretations and clarify systemic linkages.

Reliability was maintained through transparent and rigorous documentation of the research process. Thematic coding was conducted systematically, followed by iterative discussions to identify and structure causal relationships. Each variable was mapped carefully into the CLD framework, ensuring internal consistency. Additionally, the study provided thick descriptions of the research context and the dynamic interactions within the QRIS-zakat ecosystem. This allows readers to assess the transferability of the model to other Islamic digital finance settings. This approach ensures analytical transparency and supports future replication or adaptation in similar socio-religious financial ecosystems.

RESULTS

The findings of this study reveal that QRIS adoption in zakat management is shaped by the interplay of several systemic factors, with zakat literacy and digital literacy emerging as the most critical drivers. Experts consistently highlighted that low levels of public understanding regarding zakat obligations—especially in rural communities—alongside limited digital competence have significantly hindered the use of QRIS for zakat payments. This condition forms the reinforcing loop (R1: Literacy–Trust Loop), where improvements in both forms of literacy directly increase trust in QRIS, thereby encouraging greater adoption. Without such literacy, the system tends to stagnate, underscoring the urgency of launching targeted educational programs that not only build digital confidence but also deepen public understanding of zakat as a pillar of Islamic social justice.

At the same time, balancing forces hinder this growth. The most prominent are high transaction costs and poor technological infrastructure, represented in B1 (Cost–Trust Loop). According to expert input, practical barriers—such as unreliable internet, limited access to payment agents, and perceptions of hidden fees—undermine trust and usability. These issues are especially pronounced in rural and underserved areas. As trust erodes, QRIS adoption slows, especially when digital channels are perceived to contradict the value of zakat as a tool for equitable distribution. Therefore, reducing

transaction costs and expanding community-level infrastructure are non-negotiable prerequisites for inclusive digital transformation.

Another insight from the interviews concerns the role of Shariah compliance and regulatory clarity—categorized as interface variables—in bridging the gap between technological innovation and religious legitimacy. While QRIS is widely used in commercial contexts, its application in zakat management remains sensitive. Experts emphasized that without clear religious validation and communication from authorities, public skepticism will remain. Trust in QRIS is not only technical; it is also deeply ethical and religious. As supported by previous works (Prahasta, 2018; Sari et al., 2025; Wahid et al., 2022), formal fatwas, regulatory transparency, and public campaigns are essential to legitimize QRIS as a Shariah-compliant tool.

The systemic interactions visualized in Figure 1 underscore that QRIS adoption is not driven by isolated factors, but by a dynamic interplay of feedback loops. While reinforcing loops (e.g., literacy and infrastructure) can accelerate adoption, balancing loops (e.g., cost and religious concerns) can significantly slow it down. These findings highlight the importance of integrated interventions: improving literacy, lowering costs, enhancing infrastructure, and ensuring regulatory and religious legitimacy. Only by addressing these systemic leverage points can a trustworthy, inclusive, and fully Shariah-compliant digital zakat ecosystem be realized across Indonesia.

DISCUSSION

Systemic Factors Driving QRIS Adoption in Zakat Management

This study confirms that systemic factors such as zakat literacy, digital literacy, trust, infrastructure readiness, and regulatory clarity are pivotal in driving QRIS adoption in zakat management, reinforcing previous findings (Alfadri et al., 2024; Alhammadi et al., 2018). The Literacy–Trust Loop (R1) illustrates how improvements in both religious and digital literacy enhance public trust, thereby reinforcing adoption. This aligns with Alnsour (2024), who highlights that trust in digital financial platforms grows when users understand both functional benefits and religious legitimacy. However, this reinforcing mechanism is fragile—without adequate literacy, trust weakens, and adoption stagnates. This underscores the importance of integrated educational programs that bridge digital competencies and Islamic financial knowledge, as advocated by Danila et al. (2024).

Despite this potential, momentum is constrained by the Cost–Trust Loop (B1), where high transaction costs and limited infrastructure act as balancing forces that suppress adoption. These macro-level barriers mirror previous findings (Canggih et al., 2017; Chusaeni et al., 2024) suggesting that insufficient infrastructure and perceived high fees discourage digital financial engagement, especially in rural areas. Experts in this study echoed these concerns, emphasizing that without equitable access and affordable transaction models, QRIS cannot fully function as a zakat payment mechanism.

Moreover, Shariah compliance emerged as a central interface variable, consistent with the findings of Ramadania & Shauki (2023), who argue that religious legitimacy is indispensable in digital zakat systems. QRIS adoption is not solely a technological decision—it is a religiously anchored act, shaped by perceptions of conformity to Islamic principles. Thus, regulatory clarity is essential to reinforce public trust, as highlighted by Zahari et al. (2024).

Although the present model is built on expert perspectives, the exclusion of muzakki and mustahik viewpoints represents a limitation in understanding behavioral nuances at the user level. These groups may face digital hesitation, emotional doubt, or institutional unfamiliarity that influence adoption. Future studies should incorporate bottom-up system mapping that captures lived experiences and trust formation at the grassroots, thereby complementing and validating the current expert-driven framework.

Challenges in Scaling QRIS for Zakat Management

The key challenges identified—low literacy, digital skill gaps, high costs, and infrastructure deficits—are deeply intertwined. These findings echo concerns raised by Rachman et al. (2024) and Tricahyono et al. (2024), who argue that while QRIS has thrived in commercial sectors, its application in social finance (such as zakat) remains constrained by socio-economic disparities and weak support structures. The absence of contextualized literacy programs that specifically address zakat payments, along with the lack of focus on cost-reduction strategies for small-value, high-frequency transactions, represent major gaps. These systemic frictions underscore the need for targeted, multi-level interventions that address both technical and religious dimensions of QRIS adoption in the zakat ecosystem.

Theoretical Implications and Contributions

This study contributes to the literature by integrating System Thinking and the Causal Loop Diagram (CLD) into the analysis of QRIS adoption for zakat management—an approach that remains underutilized in Islamic finance research (Hidayat et al., 2024; Nasution et al., 2023). The resulting model reveals that QRIS adoption is not a linear or isolated process but rather a dynamic system shaped by interlocking feedback loops, where literacy, trust, transaction cost, and compliance interact in multifaceted ways. This systemic lens complements and expands traditional technology adoption models such as UTAUT (Danila et al., 2024) by showing how reinforcing and balancing loops function in a context bound by religious and social values. The framework identifies strategic leverage points—including literacy enhancement, cost reduction, and Shariah compliance—that can accelerate systemic progress in the digital zakat ecosystem.

Practical Implications and Recommendations

Practically, this study underscores the need for regulatory authorities to issue clear fatwas and public guidance that explicitly validate QRIS as a Shariah-compliant payment method for zakat, echoing the recommendations of Riofita (2025). Zakat institutions and fintech providers should co-develop literacy programs that are tailored

not only to technological competencies but also to religious sensitivities—ensuring user confidence in both the functionality and the Islamic legitimacy of QRIS. Reducing transaction costs—particularly for small-value, high-frequency zakat contributions—through policy incentives or fee waivers (Chusaeni et al., 2024) can further eliminate critical adoption barriers. Additionally, infrastructure development, such as expanding internet coverage and local payment access points, is indispensable, as emphasized by Prawitasari et al. (2024) in the context of digital equity.

These findings reinforce the necessity of a coordinated, multi-stakeholder strategy involving regulators, financial institutions, zakat agencies, and technology providers. Only through a holistic and systemic approach can Indonesia harness the full potential of QRIS to promote inclusive financial participation and fulfill zakat's broader mandate of equitable wealth distribution and social justice.

CONCLUSION

This study demonstrates that QRIS adoption in zakat management is a dynamic and interdependent process shaped by the interplay of literacy, trust, infrastructure, transaction costs, and regulatory clarity. The analysis reveals that zakat and digital literacy are essential drivers that reinforce trust and encourage adoption, whereas high costs and infrastructural limitations act as systemic constraints. These findings highlight the importance of addressing such challenges through integrated strategies—blending education, affordability, technological access, and Shariah-aligned governance. By applying a System Thinking approach and constructing a Causal Loop Diagram (CLD), the study offers a novel, feedback-driven framework for understanding the complexity of digital zakat transformation. This perspective not only extends conventional adoption models but also identifies strategic leverage points that can guide stakeholders in building a more inclusive, efficient, and Shariah-compliant digital zakat ecosystem.

Limitations of the Study

This study is limited by its qualitative scope and reliance on a relatively small sample of five expert participants. While the insights provide rich, context-specific understanding, they may not fully capture the diversity of user experiences across Indonesia's socio-economic and regional contexts. Additionally, the study does not incorporate quantitative validation or behavioral data from actual QRIS users, which could provide deeper insights into adoption patterns and challenges. While expert perspectives are valuable for system-level mapping, they may also reflect subjective interpretations, limiting the broader applicability of findings across diverse user groups.

Recommendations for Future Research

Future research should aim to validate the systemic model through quantitative studies that measure the strength and significance of the identified feedback loops across different user segments and regions. Surveys and experiments involving actual zakat payers, particularly in rural and underserved areas, can provide critical insights into

behavioral patterns and barriers to adoption. In addition, future studies could explore the longitudinal impact of literacy programs and policy interventions on QRIS adoption rates, using system dynamics simulations to assess policy impacts under different scenarios. Expanding the scope to include comparative studies with other digital zakat systems in Muslim-majority countries could further enrich insights into best practices and context-specific strategies for advancing financial inclusion and Shariah-compliant innovation in zakat management.

Author Contributions

Conceptualization	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.	Resources	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.
Data curation	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.	Software	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.
Formal analysis	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.	Supervision	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.
Funding acquisition	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.	Validation	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.
Investigation	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.	Visualization	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.
Methodology	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.	Writing – original draft	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.
Project administration	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.	Writing – review & editing	V.S., D.S.N., A.F., S.A., J.I.F., & M.F.S.

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Informed Consent Statement

Informed consent was obtained before respondents answered the interview.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the author used ChatGPT to improve the clarity of language and readability of the article. After using this tool, the author reviews and edits the content as needed and takes full responsibility for the content of the published article.

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