

# DRIVERS AND CHALLENGES OF ZAKAT INTEGRATION IN DIGITAL BANKING: EVIDENCE FROM PAKISTANI ISLAMIC FINANCIAL INSTITUTIONS

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## Keywords

Zakat integration, digital banking, Islamic banks, Pakistan, Technology Organization Environment framework, Fintech, drivers and challenges, Islamic finance, Shariah compliance, digital transformation

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## Abstract

**Purpose:** This study examines the drivers and challenges influencing the integration of Zakat services into digital banking platforms within Islamic financial institutions in Pakistan.

**Design/Methodology/Approach:** A qualitative multiple case study design was employed. Data were collected through 22 semi-structured interviews across seven Islamic financial institutions, supplemented by documentary analysis. A hybrid deductive inductive thematic analysis was conducted using the Technology Organization Environment (TOE) framework as the guiding analytical lens. Cross-case comparison enabled identification of institutional patterns and variations.

**Findings:** The findings demonstrate that successful digital Zakat integration requires alignment across technological readiness, organizational capacity, and environmental support. Technological drivers include perceived relative advantage, system compatibility, and secure infrastructure, while challenges involve calculation complexity and cybersecurity risks. Organizational commitment, leadership support, strategic alignment, and Shariah governance engagement significantly influence implementation outcomes. Environmental pressures, including regulatory encouragement and competitive dynamics, further shape adoption decisions. Cross-case analysis reveals systematic variation by institutional type and size, with full-fledged Islamic banks exhibiting stronger integration capabilities than Islamic windows.

**Originality/Value:** The study contributes empirical evidence on digital Zakat integration within commercial Islamic banking and extends understanding of Fintech adoption in Islamic social finance contexts.

## 1. INTRODUCTION

### 1.1 Background of the Study

The global financial landscape is undergoing profound transformation driven by rapid digitalization, with financial technology (Fintech) reshaping banking operations worldwide (Abdeldayem & Aldulaimi, 2023; Rabbani et al., 2020). This digital revolution has not spared the

Islamic finance industry, which concurrently navigates technological adoption and Shariah compliance (Hudaefi & Badeges, 2021; Mohd Nor et al., 2022). As Hassan, Rabbani, and Rashid (2022) observe, Fintech integration into Islamic financial institutions is no longer a choice but a strategic necessity for survival and growth in increasingly competitive banking environments.

Within the Islamic financial ecosystem, Zakat the third pillar of Islam represents a fundamental socio-religious obligation with immense potential for poverty alleviation and wealth redistribution (Abdullah & Sapiei, 2018; Saad & Farouk, 2019). The Qur'an explicitly identifies eight categories of Zakat recipients in Surah At-Taubah (9:60), establishing a comprehensive framework for wealth distribution. However, traditional Zakat collection and distribution mechanisms have often been criticized for lacking efficiency, transparency, and optimal outreach to deserving beneficiaries (Lessy et al., 2021; Widiastuti et al., 2021). Research on block chain based Zakat platforms in Europe similarly highlights that persistent issues of public trust and institutional transparency undermine effective Zakat management across Muslim communities (Amri et al., 2024).

The digital transformation of Zakat management represents a critical intersection between Islamic religious obligations and contemporary technological capabilities. Muyassarrah et al. (2025) argue that digitalization can significantly enhance Zakat distribution efficiency, accelerate fund allocation processes, and improve transparency and accountability. Digital platforms, including mobile applications and internet banking portals, offer the potential to streamline Zakat calculation, collection, and distribution while ensuring greater compliance with Maqasid al-Shariah (Firdaus et al., 2025; Kasri & Yuniar, 2021). Studies from Indonesia demonstrate that digital Zakat platforms have achieved 150% growth in transactions and 40% increases in operational efficiency (Noviani et al., 2025).

Pakistan presents a particularly compelling context for examining Zakat integration into digital banking platforms. As the sixth most populous nation with over 240 million people, predominantly Muslim, Pakistan possesses immense Zakat potential that remains largely underutilized (Akhtar et al., 2022; Khan & Shafiq, 2022). The State Bank of Pakistan (SBP) has actively championed digital financial inclusion, with Governor Jameel Ahmad noting that over 70% of people worldwide now use digital financial services, while more than 80% express willingness

to transition to digital systems (Ahmad, 2026). The 6th Al Baraka Forum Regional Conference, held in Karachi in January 2026, specifically highlighted Pakistan's evolving role in shaping the digital Islamic economy across Asia (Al Baraka Forum, 2026).

## 1.2 Problem Statement

Despite growing discourse on Islamic Fintech and the recognized potential of digital Zakat management, a significant gap exists in understanding the specific drivers and challenges facing Islamic financial institutions in Pakistan as they attempt to integrate Zakat services into their digital banking platforms. While theoretical benefits are well-articulated, empirical evidence regarding actual implementation experiences remains limited, particularly within the Pakistani context (Ahmed & Ali, 2023; Hassan et al., 2023). Research on Fintech adoption in Islamic social finance identifies critical challenges including insufficient technical knowledge, conservative cultural influences, lack of awareness, talent deficits, sharia compliance concerns, trust deficits, security issues, and regulatory uncertainty (Amri et al., 2024).

The challenge is multifaceted. From a technological perspective, Islamic banks must contend with legacy systems, cybersecurity concerns, and substantial investment requirements (Alam et al., 2021; Raza et al., 2023). From a Shariah compliance standpoint, automating Zakat calculation requires sophisticated algorithms capable of handling complex jurisprudential rules governing different asset categories, including gold, silver, cash, stocks, and business inventory (Laldin & Furqani, 2020; Mohd Nor et al., 2022). Furthermore, institutional factors such as organizational resistance, limited technical expertise, and competing strategic priorities may impede integration efforts (Alam & Asim, 2021; Zafar & Aziz, 2022).

Khalawi, Secretary General of the AlBaraka Forum for Islamic Economy, aptly framed the contemporary challenge: "The challenge today is no longer whether the Islamic economy can be digitalised, but how this transformation is

managed" (AlBaraka Forum, 2026, p. 4). This underscores the pressing need for empirical research that systematically examines factors facilitating or hindering Zakat integration in Pakistan's Islamic banking sector.

### 1.3 Research Questions

#### Primary Research Question

What are the key drivers and challenges influencing the integration of Zakat management into the digital banking platforms of Islamic financial institutions in Pakistan?

#### Sub-Questions

1. What technological, regulatory, and market factors drive Islamic financial institutions in Pakistan to integrate Zakat services into their digital banking platforms?
2. What operational, Shariah-related, cybersecurity, and organizational challenges hinder effective Zakat integration?
3. How do these drivers and challenges vary across different types of Islamic financial institutions based on size, age, and ownership structure?
4. What strategies can be recommended to enhance successful Zakat integration?

### 1.4 Research Objectives

This study pursues the following objectives:

- To examine the key drivers and challenges affecting the integration of Zakat management into the digital banking platforms of Islamic financial institutions in Pakistan.
- To identify and analyze the technological, regulatory, and market-related drivers that motivate Pakistani Islamic financial institutions to integrate Zakat services into their digital platforms.
- To investigate the operational, Shariah compliance, cybersecurity, and organizational challenges that impede Zakat integration in digital banking.

- To compare the experiences of different categories of Islamic financial institutions to understand how institutional characteristics (size, age, and ownership structure) influence integration outcomes.
- To develop evidence-based recommendations for policymakers, bank managers, and Shariah scholars to facilitate successful Zakat integration in digital banking.

### 1.5 Significance of the Study

Theoretically, the study contributes to emerging literature on Islamic Fintech by providing empirical evidence from Pakistan, applying the TOE framework to Islamic social finance within commercial banking (Baker, 2012; Tornatzky & Fleischer, 1990). Research on Fintech adoption in zakat institutions remains limited despite significant advancements, with particular gaps in understanding implementation challenges (Amri et al., 2024). Practically, findings benefit bank managers, Shariah scholars, and technology providers by identifying critical success factors and potential pitfalls. At the policy level, the study offers inputs for SBP and other regulatory bodies seeking to promote digital Islamic finance, responding to calls for "a transparent and integrated framework for digital Islamic banking" (AlBaraka Forum, 2026, p. 8). Studies on online Zakat payment adoption emphasize that trust has the largest effect size on user attitudes, highlighting the importance of security and transparency in digital Zakat systems (Caniago et al., 2025). Ultimately, improved digital Zakat integration has the potential to enhance wealth redistribution efficiency, contributing to poverty alleviation and sustainable social welfare development.

### 1.6 Scope and Delimitations

The study focuses on Islamic financial institutions operating within Pakistan's banking sector, including full-fledged Islamic banks and Islamic windows of conventional banks. It examines Zakat integration within digital banking platforms, adopting a supply-side perspective. The research

captures the current state as of 2025–2026, employing qualitative approaches for depth and nuance. The study does not extend to dedicated Zakat institutions, comprehensively examine Zakat distribution mechanisms, or provide detailed technical evaluation of specific platforms.

## 2. LITERATURE REVIEW

### 2.1 Theoretical Foundation: The Technology-Organization-Environment Framework

The Technology-Organization-Environment (TOE) framework, developed by Tornatzky and Fleischer (1990), provides a comprehensive theoretical lens for understanding technology adoption at the organizational level. The framework posits that three contextual elements influence technological innovation adoption: the technological context, the organizational context, and the environmental context. These elements present "both constraints and opportunities for technological innovation" (Tornatzky & Fleischer, 1990).

The technological context encompasses internal and external technologies relevant to the firm. The organizational context refers to firm characteristics and resources, including size, structure, and human resources. The environmental context includes industry structure, competitors, and regulatory environment. Since its introduction, the TOE framework has been widely applied across diverse technological and industrial contexts (Oliveira & Martins, 2011; Baker, 2012). Research on technology acceptance in Islamic social finance frequently employs extended frameworks combining TAM, UTAUT, and trust constructs (Kasri & Yuniar, 2021; Caniago et al., 2025), demonstrating the importance of multi-dimensional approaches to understanding adoption phenomena.

In banking and Fintech research, the TOE framework has been extensively employed. Abdurrahman et al. (2024) applied it to investigate Islamic mobile banking adoption in Indonesia, finding that factors within each contextual dimension significantly impact adoption outcomes. Studies on behavioral intention to adopt blockchain-based Zakat platforms in European contexts similarly emphasize the

importance of performance expectancy, intrinsic religiosity, and trust as significant determinants (Islamic Social Fintech in Europe, 2026). The framework is particularly suitable for this study because its organizational level of analysis aligns with the focus on financial institutions, its three dimensions map directly onto research questions, and its flexibility allows incorporation of context-specific factors like Shariah compliance.

### 2.2 Islamic Fintech: Evolution and Landscape

Islamic Fintech refers to technology-enabled innovation in financial services complying with Shariah principles (Hassan et al., 2022; Rabbani et al., 2020). It encompasses digital applications in Islamic banking, Takaful, Sukuk, and Islamic asset management. According to the Islamic Financial Services Board (IFSB, 2025), Islamic finance assets surged to \$3.88 trillion in 2024, posting 14.9% annual growth.

Key technologies enabling Islamic Fintech include blockchain for enhanced transparency (Ghouse Mohiuddin & Abolola, 2025), artificial intelligence for personalized services (Kestrl, 2024), and digital platforms integrating faith-aligned features (Bank Muamalat Malaysia, 2024). Research on blockchain-based Zakat systems highlights their potential to address transparency and trust issues through immutable transaction records and smart contracts that automate compliance with Shariah rules (Islamic Social Fintech in Europe, 2026). Adoption in Islamic finance is more gradual than conventional finance due to strict Shariah compliance requirements (Akram et al., 2025). Studies on risk perception in Fintech-based Zakat payment reveal that perceived risks of privacy, security, and time may not significantly determine adoption intention, suggesting that muzakkis prioritize perceived behavioral control, perceived usefulness, and subjective norms (Mustofa et al., 2025).

### 2.3 Digital Transformation in Zakat Management

Zakat is an obligatory wealth redistribution mechanism serving both spiritual and material purposes (Kahf, 2019). Contemporary scholarship emphasizes Zakat's potential for poverty alleviation

and sustainable development (Abdullah & Sapiei, 2018; Widiastuti et al., 2021). Digital Zakat refers to applying digital technologies to Zakat management processes, including calculation, collection, distribution, and reporting (Muyassarrah et al., 2025; Kasri & Yuniar, 2021). Research from Indonesia demonstrates that digital Zakat platforms have successfully integrated sharia principles with technological innovation, achieving significant growth in transactions and operational efficiency (Noviani et al., 2025).

International experiences vary significantly. Malaysia leads with comprehensive Zakat services integrated into digital banking (Bank Muamalat Malaysia, 2024). The UAE has partnered with Fintech companies for enhanced offerings (Emirates Islamic, 2025). Indonesia has witnessed substantial growth while addressing challenges including digital literacy gaps affecting 35% of potential users and absence of national standardization (Noviani et al., 2025). Studies on online Zakat payment adoption in Indonesia validate that trust, perceived usefulness, and perceived ease of use have significant positive effects on attitude, while attitude strongly influences behavioral intention (Caniago et al., 2025).

Challenges include legacy systems, cybersecurity concerns, Shariah compliance complexity, and institutional resistance (Alam et al., 2021; Laldin & Furqani, 2020). Research identifies insufficient technical knowledge, traditional cultural influences, lack of awareness, talent deficits, trust deficits, and regulatory issues as significant barriers to Fintech adoption in zakat institutions (Amri et al., 2024).

#### 2.4 Islamic Banking in Pakistan: Context and Digital Transformation

Pakistan's Islamic banking industry has grown substantially since SBP introduced comprehensive Islamic banking policy in 2001 (State Bank of Pakistan, 2024). The digital banking landscape has transformed rapidly, driven by SBP's National Financial Inclusion Strategy and the launch of Raast, Pakistan's instant payment system (Khan & Shafiq, 2022). Zakat management operates through dual state-administered and voluntary

mechanisms, with digital integration limited until recently (Akhtar et al., 2022).

#### 2.5 Conceptual Framework Development

Based on the Technology-Organization-Environment (TOE) framework and the literature review, this study develops a conceptual framework identifying potential drivers and challenges across three contextual dimensions.

##### 2.5.1 Technological Context

Drivers include relative advantage the perceived benefits of Zakat integration compared to traditional methods, encompassing operational efficiency and customer satisfaction (Rogers, 2003; Tornatzky & Fleischer, 1990). Compatibility refers to alignment with existing IT infrastructure, facilitating smoother adoption (Abdurrahman et al., 2024). Trialability enables pilot testing before full implementation, reducing risk (Rogers, 2003). Observability makes integration outcomes visible to stakeholders, encouraging broader adoption (Baker, 2012). Challenges include complexity of implementing accurate Zakat calculation (Alam et al., 2021), cybersecurity risks associated with financial transactions (Raza et al., 2023), legacy system constraints limiting integration capabilities (Alam & Asim, 2021), and substantial integration costs, particularly for smaller institutions (Bany Mohammad et al., 2022).

##### 2.5.2 Organizational Context

Drivers encompass top management support, ensuring resource allocation and strategic priority (Awa et al., 2017; Kimiagari & Baei, 2022). Organizational readiness reflects availability of financial, technical, and human resources (Senyo et al., 2019). Strategic alignment ensures consistency with broader digital strategy (Abdurrahman et al., 2024). Shariah committee support provides religious legitimacy and guidance (Fidhayanti et al., 2024; Laldin & Furqani, 2020). Challenges include limited technical expertise in Islamic Fintech (Alam et al., 2021), organizational resistance to changing established processes (Alam & Asim, 2021), competing priorities diverting resources from Zakat initiatives (Kajla et al., 2023), and knowledge gaps among decision-makers

regarding digital possibilities (Ahmed & Ali, 2023).

### 2.5.3 Environmental Context:

Drivers include regulatory support from the State Bank of Pakistan encouraging digital financial services (Ahmed & Ali, 2023; Khan & Shafiq, 2022). Competitive pressure motivates institutions to match rival offerings (Abdurrahman et al., 2024). Customer demand, particularly during Ramadan, creates market validation (Ahmad, 2026; Kasri & Yuniar, 2021). Industry best practices from other Muslim countries inform local approaches (Moniruzzaman, 2025). Challenges encompass regulatory uncertainty due to absent specific guidelines for digital Zakat (Akhtar et al., 2022; IFSB, 2025). Shariah compliance complexity requires ongoing scholarly engagement beyond initial approval (Mohd Nor et al., 2022). Market volatility affects investment decisions, particularly for smaller institutions (State Bank of Pakistan, 2024). Infrastructure limitations, including inconsistent internet connectivity, constrain service reach (Raza et al., 2023; Khan & Shafiq, 2022).

This framework guides the empirical investigation by identifying specific factors within each TOE dimension that may influence Zakat integration outcomes, acknowledging variation across institutions based on size, age, and ownership structure.

## 3. RESEARCH METHODOLOGY

### 3.1 Research Design

This study adopts a qualitative multiple case study design to explore the drivers and challenges associated with digital Zakat integration within Islamic financial institutions in Pakistan. A qualitative approach was selected to capture contextual, organizational, and governance dynamics that cannot be adequately understood through quantitative measures alone. Consistent with the Technology Organization Environment (TOE) framework (Abdurrahman et al., 2024), the study examines how institutional conditions across three dimensions influence digital adoption processes in Islamic banking contexts.

The multiple case design enables cross-institutional comparison, allowing identification of both convergent patterns and structural variations across institutional types and sizes. This design is appropriate for investigating complex, context-dependent innovation phenomena where technological, organizational, and environmental factors interact dynamically.

### 3.2 Theoretical Framework

The Technology Organization Environment (TOE) framework provides the analytical foundation for this study. Originally developed to explain organizational technology adoption, TOE posits that innovation decisions are shaped by technological characteristics, organizational readiness, and environmental pressures (Abdurrahman et al., 2024). The framework has been widely applied in banking and fintech research; however, its application to digital Zakat integration within Islamic banking remains underexplored.

In the context of Islamic social finance, additional domain-specific considerations arise, including Shariah compliance complexity and jurisprudential governance requirements (Laldin & Furqani, 2020). By integrating TOE with Islamic fintech literature, this study examines how religious governance structures interact with technological modernization processes.

### 3.3 Sample and Data Collection

Data were collected through semi-structured interviews conducted with 22 senior professionals across seven Islamic financial institutions operating in Pakistan. The sample included full-fledged Islamic banks and Islamic banking divisions within conventional banks to capture structural variation. Respondents held roles in digital banking, information technology, Shariah compliance, strategic planning, and executive management.

Semi-structured interviews were selected to allow flexibility in exploring institution-specific experiences while maintaining consistency across core themes aligned with the TOE framework. Interview protocols included questions related to technological infrastructure, leadership support,

Shariah governance involvement, regulatory environment, competitive dynamics, and implementation challenges.

Each interview lasted between 45 and 90 minutes and was conducted under confidentiality agreements to ensure candid responses. Interviews were recorded (with consent), transcribed verbatim, and anonymized during analysis. In addition to primary interview data, document analysis was conducted using annual reports, digital banking disclosures, regulatory publications, and policy documents to triangulate findings and enhance credibility.

### 3.4 Data Analysis

Thematic analysis was conducted using a hybrid deductive inductive coding approach. The initial coding framework was informed by the TOE model, providing three aggregate dimensions: technological, organizational, and environmental. Within each dimension, open coding was first applied to identify first-order concepts emerging from interview transcripts. These concepts were subsequently grouped into second-order themes through iterative axial coding.

Constant comparison techniques were employed to refine category boundaries and ensure conceptual clarity. The coding process involved repeated review of transcripts to identify patterns, similarities, and differences across institutions. Cross-case analysis was then conducted to examine how themes manifested differently across institutional types (full-fledged Islamic banks versus Islamic windows), sizes, and infrastructure maturity levels.

NVivo software was used to facilitate data organization and coding management; however, thematic interpretation remained researcher-driven. Theoretical saturation was achieved when additional interviews did not yield new thematic categories.

### 3.5 Trustworthiness and Rigor

To enhance credibility, the study employed methodological triangulation by combining interview data with institutional document analysis. Member checking was conducted informally during interviews to confirm

interpretive accuracy. Consistency in coding was maintained through iterative review and reflexive memoing.

Dependability was strengthened by maintaining an audit trail documenting coding decisions and theme development. Confirmability was supported through systematic alignment between empirical findings and theoretical constructs. While qualitative research does not seek statistical generalization, analytic generalization was achieved by linking findings to established theoretical frameworks (Rogers, 2003; DiMaggio & Powell, 1983; Abdurrahman et al., 2024).

### 3.6 Ethical Considerations

All participants were informed of the study's academic purpose and assured confidentiality. Institutional identities are referenced only where publicly available information is used; interview responses are anonymized to protect organizational and individual confidentiality. Data were stored securely and used solely for academic research purposes.

## 4. FINDINGS AND ANALYSIS

This section presents the findings derived from semi-structured interviews conducted with senior managers, Shariah advisors, IT specialists, and digital banking executives across seven Pakistani banks: Meezan Bank, BankIslami Pakistan, Dubai Islamic Bank Pakistan, Bank Alfalah (Islamic Banking Division), HBL Islamic Banking, MCB Islamic Banking, and UBL Ameen. Thematic analysis was conducted following iterative coding procedures, and findings are organized according to the Technology–Organization–Environment (TOE) framework. Cross-case comparison enabled identification of convergent and divergent institutional patterns.

### 4.1 Technological Context

#### 4.1.1 Perceived Technological Benefits

Respondents across all participating institutions consistently described digital Zakat integration as an operationally transformative innovation. The automation of Zakat calculation, particularly nisab verification and annual deduction processes, was viewed as enhancing procedural transparency and

reducing reliance on manual computation. Interviewees emphasized that embedding Zakat modules within core banking systems enables real-time calculation accuracy and audit traceability, which strengthens both regulatory compliance and customer trust.

Executives from full-fledged Islamic banks described digital Zakat systems as reinforcing institutional authenticity by aligning technological infrastructure with Shariah governance requirements. In contrast, representatives from Islamic banking divisions of conventional banks framed digital Zakat primarily as an extension of broader digital service enhancement strategies. Despite these framing differences, respondents agreed that digitalization improved operational efficiency, minimized calculation discrepancies, and enhanced customer confidence in Shariah-compliant financial management.

#### 4.1.2 Cybersecurity and Data Governance

Cybersecurity considerations emerged as a central technological theme. Participants highlighted that Zakat-related transactions involve sensitive financial and beneficiary data, necessitating enhanced data protection mechanisms. Institutions with more mature enterprise IT architectures reported integrating Zakat modules within existing cybersecurity governance frameworks, including encrypted transaction channels and multi-layer authentication systems. Respondents emphasized that digital Zakat adoption did not introduce entirely new cybersecurity risks but required recalibration of existing controls to accommodate charitable transaction flows. In several cases, Shariah boards collaborated with IT departments to ensure that digital automation preserved doctrinal integrity while meeting enterprise-level data governance standards. Rather than functioning as a barrier, cybersecurity was described as a structured prerequisite for sustainable digital Zakat implementation.

#### 4.1.3 System Compatibility and Infrastructure Readiness

Compatibility between digital Zakat modules and legacy core banking systems significantly

influenced implementation processes. Full-fledged Islamic banks generally reported smoother integration, attributing this to unified governance structures and centralized Shariah oversight embedded within their operational architecture. Conversely, Islamic banking divisions within conventional banks described additional coordination requirements between centralized IT units and Islamic banking departments.

Although these structural layers occasionally extended implementation timelines, respondents indicated that they did not undermine strategic commitment to adoption. Instead, infrastructure maturity shaped the degree of procedural complexity involved in system integration. Institutions with prior experience in Fintech deployment reported greater adaptability in embedding charitable automation within existing digital ecosystems.

## 4.2 Organizational Context

### 4.2.1 Top Management Support

Across all cases, executive endorsement emerged as a decisive organizational enabler. Respondents consistently noted that digital Zakat initiatives required explicit top management sponsorship to secure budget allocation, vendor partnerships, and Shariah board engagement. In full-fledged Islamic banks, digital Zakat was framed as a strategic extension of institutional mission, reinforcing long-term Islamic finance positioning.

Within Islamic banking divisions of conventional banks, senior leadership often viewed digital Zakat as a reputational differentiator in an increasingly competitive Islamic finance landscape. In both institutional categories, visible executive commitment facilitated interdepartmental coordination and reduced bureaucratic friction during implementation. The findings indicate that leadership framing significantly shapes the institutional legitimacy of digital philanthropic innovation.

### 4.2.2 Organizational Culture and Change Management

Interview data revealed that organizational adaptation to digital Zakat systems required structured change management. While strategic

endorsement was strong, some respondents acknowledged initial hesitation among branch-level personnel accustomed to manual charitable processing methods. This resistance was generally temporary and mitigated through training workshops, internal awareness campaigns, and pilot implementations.

Islamic banks reported comparatively smoother cultural alignment due to existing familiarity with Shariah-compliant instruments. However, even within these institutions, cross-functional collaboration between IT specialists and Shariah advisors required deliberate coordination mechanisms. Conventional banks' Islamic divisions described a greater need for sensitization sessions to harmonize technological innovation with doctrinal compliance expectations. Overall, cultural readiness was strengthened through participatory governance and incremental implementation strategies.

#### 4.2.3 Human Capital and Digital Competence

Human capital capacity emerged as a moderate organizational constraint. Participants emphasized the scarcity of professionals possessing both advanced Fintech competencies and Islamic jurisprudential literacy. Several institutions reported reliance on cross-functional teams combining IT engineers with Shariah scholars to bridge this expertise gap.

Full-fledged Islamic banks appeared to benefit from stronger in-house Shariah integration, while conventional banks leveraged broader enterprise IT talent pools. Respondents agreed that long-term sustainability of digital Zakat initiatives depends on cultivating hybrid skill sets capable of aligning technological sophistication with religious compliance standards.

### 4.3 Environmental Context

#### 4.3.1 Regulatory and Shariah Governance Environment

The regulatory environment was widely perceived as supportive of digital Islamic finance innovation. Participants acknowledged that the State Bank of Pakistan's Islamic banking framework provided structural clarity regarding Shariah governance and compliance oversight. This regulatory

certainty reduced ambiguity surrounding automated Zakat deduction mechanisms.

Institutional Shariah boards were described as central actors in validating algorithmic calculation logic and ensuring doctrinal alignment. Importantly, respondents emphasized that digitalization did not diminish Shariah authority; rather, it operationalized religious oversight within system architecture. This embedded governance structure strengthened environmental legitimacy and enhanced stakeholder confidence.

#### 4.3.2 Competitive Dynamics

Competitive pressure emerged as a meaningful environmental driver. Interviewees indicated that digital Zakat features increasingly function as differentiation mechanisms within Pakistan's expanding Islamic banking sector. Full-fledged Islamic banks tended to interpret this differentiation through a mission-driven lens, whereas Islamic divisions within conventional banks viewed it as part of customer retention strategies.

Several respondents referenced Ramadan as a period of intensified competitive signaling, during which institutions emphasize charitable facilitation capabilities. Early adopters were perceived to gain reputational advantages by demonstrating technological leadership in Shariah-compliant innovation.

#### 4.3.3 Customer Expectations and Societal Norms

Customer demand for seamless, mobile-integrated Islamic financial services was consistently identified as a strong environmental influence. Respondents observed that digitally literate customers increasingly expect automated Zakat calculators embedded within banking applications. Transparency in charitable deduction and distribution mechanisms was described as essential for sustaining public trust. Societal expectations surrounding accountability in Zakat management further reinforced institutional motivation to digitize. Interviewees emphasized that digital solutions respond to broader community calls for traceability and structured governance in religious financial obligations.

#### 4.4 Cross-Case Synthesis

Comparative analysis across cases reveals that institutional identity, governance integration, and technological maturity jointly shape adoption trajectories. Full-fledged Islamic banks demonstrated stronger strategic embedding of digital Zakat within core institutional narratives, whereas Islamic banking divisions integrated the innovation within broader digital transformation agendas. Institutions with cohesive Shariah IT coordination structures experienced smoother compliance validation processes, while infrastructure sophistication reduced but did not eliminate implementation complexity.

These cross-case patterns indicate that digital Zakat adoption is not solely technology-driven but emerges from alignment between organizational culture, governance architecture, and environmental legitimacy pressures.

#### 4.5 Theoretical Implications

The findings reinforce the applicability of the Technology Organization Environment framework within Islamic Fintech contexts while simultaneously extending it. Specifically, Shariah governance functions as a structurally embedded organizational sub-dimension that shapes technological evaluation criteria. Furthermore, environmental pressures in Islamic finance are normatively anchored in religious legitimacy considerations, rather than purely market-based competition.

By illustrating how religious compliance logic intersects with digital innovation strategy, this study contributes to the refinement of TOE theory in culturally embedded financial systems. The adoption of digital Zakat systems reflects not merely technological modernization but the institutionalization of faith-based governance within digital infrastructures.

### 5. DISCUSSION AND CONCLUSIONS

#### 5.1 Discussion of Findings

The findings demonstrate that digital Zakat integration is not a purely technological initiative but a multidimensional transformation requiring alignment across technological, organizational, and environmental domains. Institutions

categorized as advanced exhibit coherence across these dimensions, while those at intermediate or basic stages experience friction arising from misalignment in at least one domain. This reinforces the configurational logic of the TOE framework, where adoption outcomes are shaped by the interaction not isolation of contextual forces.

Within the technological dimension, the results strongly align with Rogers' (2003) diffusion attributes and prior TOE applications in banking contexts (Abdurrahman et al., 2024). Perceived relative advantage, operationalized through improved efficiency, accuracy, and enhanced customer experience, emerged as a central adoption driver. Evidence of strong customer engagement and service performance outcomes reinforces theoretical propositions that innovations perceived as superior to existing practices accelerate adoption. Compatibility with modern digital architectures proved decisive, corroborating Senyo et al. (2019), who argue that infrastructure maturity conditions digital transformation success. Institutions with modular, API-enabled systems progressed more smoothly than those constrained by legacy infrastructures.

Trialability and phased implementation strategies further validate Rogers' (2003) proposition that incremental experimentation reduces uncertainty. Observability effects were evident in competitive benchmarking behavior, aligning with institutional isomorphism theory (DiMaggio & Powell, 1983). Institutions responded to visible industry innovation by initiating board-level discussions and strategic reassessments. At the same time, complexity emerged as uniquely amplified in Islamic Fintech contexts. Accurate Zakat calculation involves jurisprudential variability and asset classification nuance, extending Laldin and Furqani's (2020) argument that Shariah-compliant digitalization entails doctrinal precision beyond conventional Fintech design. Cybersecurity concerns similarly align with Raza et al. (2023), reinforcing that trust infrastructure is foundational in Islamic financial technology ecosystems. Resource intensity and infrastructure asymmetry further validate the "size puzzle" identified by Hassan et al. (2022), where

scale economies condition Fintech adoption capability. Emerging blockchain-based Zakat research also emphasizes that while transparency-enhancing technologies can increase trust, technical complexity and infrastructure demands remain substantial barriers (Islamic Social Fintech in Europe, 2026).

Organizationally, the study confirms the centrality of leadership commitment in digital transformation processes (Alam & Asim, 2021). Executive sponsorship influenced resource allocation, interdepartmental coordination, and the symbolic legitimacy of digital Zakat initiatives. Institutions with strong top management support embedded digital Zakat within broader strategic narratives, enhancing continuity and institutional coherence. Conversely, where leadership framing was weaker, initiatives competed with other digital priorities.

Human capital constraints and cultural resistance further illustrate structural adoption barriers. These findings align with Amri et al. (2024), who identify conservative institutional culture and limited technical expertise as persistent inhibitors of Fintech implementation in zakat institutions. Importantly, this study extends existing literature by demonstrating that Shariah governance engagement must be continuous rather than episodic. As Fidhayanti et al. (2024) suggest, digital Islamic finance requires dynamic oversight; the findings confirm that algorithm updates and interpretive nuances necessitate ongoing scholarly involvement rather than one-time certification.

Environmental findings underscore the enabling yet complex role of regulation. Regulatory encouragement provides legitimacy scaffolding, but operational ambiguity generates cautious implementation. Trust and transparency emerged as pivotal, reinforcing Caniago et al. (2025), who demonstrate that trust exerts the strongest influence on online Zakat adoption attitudes. Interestingly, Mustofa et al. (2025) find that perceived risk does not significantly hinder adoption when usefulness and social norms are strong. The present findings support this proposition: institutions emphasizing efficiency gains and leveraging religious legitimacy narratives

appear better positioned to overcome environmental constraints.

Cross-case analysis highlights systematic variation based on institutional structure, scale, and technological maturity. Full-fledged Islamic banks demonstrated stronger alignment between organizational identity and innovation logic, while Islamic windows faced coordination complexities inherent in hybrid governance models. Larger institutions benefited from scale-driven resource advantages, reinforcing Hassan et al. (2022). Institutional age and infrastructure maturity further shaped readiness, illustrating that digital Zakat capability is path-dependent and structurally embedded.

Collectively, the discussion confirms that digital Zakat adoption represents a layered institutional transformation shaped by technological infrastructure, leadership commitment, Shariah governance integration, and competitive positioning.

## 5.2 Theoretical Contributions

This study advances theory in five principal ways. First, it extends the Technology–Organization–Environment framework to Islamic Fintech applications within commercial banking. While TOE has been widely applied in banking digitization research (Abdurrahman et al., 2024), its deployment in the context of Zakat integration introduces doctrinal complexity and religious governance as embedded subdimensions. This demonstrates that TOE remains robust yet requires contextual adaptation in faith-based financial systems.

Second, the study contributes to emerging literature on digital Zakat management (Firdaus et al., 2025; Muyassarrah et al., 2025) by providing empirical evidence from Pakistan, addressing a significant geographical gap. Prior research has concentrated primarily in Southeast Asia and the Middle East (Islamic Social Fintech in Europe, 2026); this study broadens regional representation and enhances contextual diversity in Islamic Fintech scholarship.

Third, the findings provide empirical elaboration of the “size puzzle” in Islamic Fintech adoption (Hassan et al., 2022). Rather than treating scale as

an abstract structural condition, this study documents how resource availability, IT infrastructure maturity, and talent acquisition capacity concretely mediate innovation outcomes. Fourth, the research contributes to institutional theory by demonstrating how organizational form full-fledged Islamic bank versus Islamic window shapes innovation capability. Hybrid governance arrangements introduce structural negotiation costs that influence technological integration trajectories.

Fifth, the study advances understanding of Shariah compliance as a dynamic governance process in digital environments. Consistent with Laldin and Furqani (2020), it demonstrates that digital Islamic finance requires continuous jurisprudential engagement embedded within technological systems rather than static compliance validation.

### 5.3 Practical Implications

For Islamic bank executives, the findings underscore the necessity of visible leadership commitment and strategic embedding of digital Zakat within broader transformation agendas. Investment in modular, scalable IT infrastructure reduces long-term integration costs and enhances flexibility. Early and sustained engagement with Shariah committees mitigates compliance risks and strengthens institutional legitimacy.

For Islamic windows, the results highlight the importance of internal advocacy and alignment with parent bank objectives. Demonstrating customer demand, reputational differentiation, and alignment with corporate social responsibility strategies may strengthen internal support for innovation.

For Shariah scholars, proactive engagement with digital platforms is increasingly essential. Continuous oversight ensures doctrinal integrity amid algorithm updates and technological evolution. Developing technological literacy among Shariah boards will enhance governance effectiveness.

For technology providers, robust and flexible Zakat calculation engines capable of accommodating jurisprudential diversity are critical. Integration capabilities, security

architecture, and transparency features must be embedded from design inception. As blockchain research suggests, transparency-enhancing technologies may strengthen trust, but design must carefully balance technical sophistication with user accessibility (Islamic Social Fintech in Europe, 2026).

### 5.4 Policy Recommendations

For the State Bank of Pakistan, developing detailed regulatory guidance specific to digital Zakat services would reduce institutional ambiguity. Clear standards regarding data governance, audit trails, and Shariah oversight would strengthen implementation confidence. Regulatory sandboxes and collaborative industry forums could accelerate innovation diffusion. Empirical research confirms that regulatory frameworks significantly influence Fintech adoption trajectories (Amri et al., 2024; IFSB, 2025).

Educational institutions should address hybrid skill shortages by integrating Fintech modules within Islamic finance curricula. Professional certification bodies may consider developing specialized credentials in Islamic Fintech governance.

Industry associations can facilitate collective standard-setting for Zakat calculation algorithms and compliance auditing frameworks, reducing duplication of effort and promoting sector-wide consistency.

### 5.5 Limitations and Future Research

This study is subject to several limitations. Its geographic focus on Pakistan limits generalizability to other regulatory and cultural environments. The supply-side orientation excludes perspectives of Zakat payers and beneficiaries. As a qualitative cross-sectional study, it captures institutional dynamics at a specific moment rather than over time. While anonymity enhanced candor, it limited granular attribution. Furthermore, emerging technologies such as blockchain were not empirically examined.

Future research should pursue quantitative validation through large-scale surveys testing the relative weight of TOE dimensions. Longitudinal

studies could assess how digital Zakat systems evolve over time. Customer-centered research examining adoption behavior, trust formation, and satisfaction would complement institutional insights. Comparative cross-country analysis could illuminate contextual moderators. Finally, empirical investigation of blockchain-enabled Zakat ecosystems could reveal alternative institutional models beyond banking-centric frameworks.

### 5.6 Conclusions

This study examined the drivers and challenges shaping digital Zakat integration within Pakistani Islamic financial institutions. Through multi-case qualitative analysis, it demonstrates that adoption is contingent upon multidimensional alignment across technological infrastructure, organizational governance, and environmental legitimacy pressures.

Technological enablers include perceived relative advantage, compatibility, and observability, while complexity and infrastructure constraints remain significant barriers. Organizational capability hinges on leadership commitment, resource readiness, and continuous Shariah governance engagement. Environmental forces regulatory encouragement, competitive dynamics, and societal expectations simultaneously motivate and constrain institutional action.

Cross-case patterns reveal systematic variation by institutional form, scale, and technological maturity. Full-fledged Islamic banks exhibit stronger integration capacity than Islamic windows; larger institutions benefit from scale-driven advantages; infrastructure maturity shapes readiness trajectories.

Beyond theoretical contribution, the societal implications are substantial. Effective digital Zakat systems enhance transparency, accountability, and operational efficiency in religious wealth redistribution. In contexts with significant Zakat potential and expanding Islamic banking sectors, digital integration offers a pathway toward strengthened financial inclusion and improved social welfare outcomes. As Amri et al. (2024) emphasize, addressing institutional, technological, and governance challenges through capacity

building, regulatory refinement, and transparency enhancement is essential for unlocking the transformative potential of digital Zakat systems.

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