

PERSONALIZE QRIS FOR TRACKING AND RETAINING MUZAKKI BASE IN ENHANCING ZAKAT COLLECTION

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ABSTRACT

This research investigates the utilization of a customized Quick Response Code Indonesian Standard (QRIS) for zakat donations to monitor and maintain the donor base (muzakki) within a zakat institution, with the expectation of improving zakat collection. Personalized QRIS is the creation of a QRIS code for alms/donation payments that is specific to each donor/muzakki. The study conceptualizes muzakki retention as a strategic asset within the Resource-Based View (RBV) and represents the donor base as a stock influenced by acquisition and turnover flows through feedback loops in a system dynamics (SD) framework. The data shows that personalized QRIS interfaces make it harder for customers to leave and find new ones, which helps the Active muzakki stock grow faster. This study identifies reinforcing loops that strengthen retention among active muzakki and boost reactivation among passive muzakki. These patterns align with donor-loyalty research, where service quality and commitment consistently emerge as the main drivers of continued giving. The findings originate from a single institutional context and are contingent upon the quality of the data and the model boundary selections. Future research could examine the multi-institutional generalizability, investigate heterogeneous treatment effects, and incorporate end-to-end customization on the receiving end of the donation. For zakat institutions, QRIS adoption and customization offer a low-cost data backbone to track donor journeys and layer personalization on the main actionable levers: welcome flows, amount anchoring, churn-risk flags, and reactivation cadences. These tools can be stacked and evaluated as muzakki resource indicators, such as acquisition, retention, and reactivation rate. In line with the national digitization of zakat initiatives, the operationalization of personalized QRIS within zakat institutions could improve data management and increase predictable zakat inflows. It will enable them to establish a sustainable zakat distribution program, which will enhance social welfare outcomes. Evidence shows that the zakat sector is ready for scalable digital transformation. The paper contributes to the body of knowledge by using a resource-based view management approach to donor retention and management as a strategic resource in zakat institutions. It also utilizes a system dynamics stock and flow model that focuses on the donor base, transforming personalized QRIS into a testable policy lever using real transaction data.

Keywords: Donor Retention, System Dynamics, Personalized Donation, Personalized QRIS.

I. INTRODUCTION

The national zakat ecosystem has continued the growth trend, with reported collections reaching IDR 40.5 trillion in 2024 and a policy target of IDR 50 trillion in 2025 (Baznas, 2024). These trends signal both scale and social impact, while underscoring the need for stable, predictable inflows that enable sustainable zakat distribution to mustahik. Fundraising research consistently shows that retaining existing donors is more cost-effective than acquiring new ones. For zakat institutions, muzakki retention is therefore a strategic lever.

Indonesia's rapid shift to digital payments is reshaping how individuals conduct and manage small transactions. Bank Indonesia's Quick Response Code Indonesian Standard (QRIS) unifies QR payments across providers, creating interoperable rails that reduce limitations and open space for service innovation. Despite strong adoption of QRIS and continued growth in zakat collection, retention remains under-examined in this context. Payments made through QRIS are not tied to a verified donor identity. Unless donors self-report, payer information remains unknown. As a result, the zakat institution faces a growing volume of transactions that cannot be linked to a specific donor or assigned to a particular program. The issue is compounded by QRIS's very low entry threshold (as low as Rp 1), which drives high usage and leads to an increase in the number of untraceable gifts. This undermines donor management, accurate reporting, and targeted program stewardship.

This study addresses that gap with four objectives. First, it conceptualizes muzakki retention as a strategic resource within the RBV and links it to sustained institutional performance. Most digitization efforts emphasize onboarding and payment convenience, while fewer studies explicitly treat donor retention as a strategic resource. Second, it develops a system dynamics model of the donor base (active muzakki). Third, it assesses the impact of personalized QRIS touchpoints on donor acquisition and reactivation of donor lapses. Personalized QRIS is the creation of a QRIS code for alms/donation payments that is specific to each donor/muzakki. Finally, it derives a strategy and implementation avenue for the zakat institution on how to operationalize QRIS-based personalization within existing processes.

The remainder of the paper proceeds as follows. The next section reviews the literature on donor retention, zakat digitization, and RBV foundations. We then present the system dynamics model and the personalization policies embedded in it, followed by data and methods for empirical evaluation. Subsequent sections discuss managerial and social implications, limitations, and directions for future research. The paper closes with conclusions.

II. LITERATURE REVIEW

The literature on donor retention, digital payments and personalization, and organizational theory offers a coherent foundation for modeling zakat donor (muzakki) dynamics. In nonprofit fundraising, donor loyalty is consistently linked to perceptions of service quality, trust, and commitment (Morgan & Hunt, 1994; Parasuraman et al., 1988; Sargeant & Woodliffe, 2007), and retention is shown to drive long-run revenue more efficiently than acquisition (Sargeant & Shang, 2010).

In parallel, research on digital payment adoption finds performance and effort expectancy, social influence, and facilitating conditions to be robust predictors of uptake (Oliveira et al., 2016; Venkatesh et al., 2003). Within charitable contexts, field experiments demonstrate that personalized or targeted appeals can lift participation and donation amounts, suggesting operational levers for digital touchpoints (Huck & Rasul, 2011; Karlan & List, 2007; DellaVigna et al., 2012). Evidence from donor-return studies using survival/hazard models further shows that lapse can be quantified and predicted, though most work comes from general charities or blood donation and has not yet been translated to zakat institutions (Charbonneau et al., 2013).

From a strategy lens, the Resource-Based View (RBV) explains sustained performance as arising from valuable, rare, inimitable, and non-substitutable resource bundles (Barney, 1991). By interpreting an engaged muzakki base as such an essential resource, this study extends RBV application to Islamic social finance. System dynamics (SD) provides a complementary method to formalize the donor base as a stock regulated by acquisition and churn flows (Sterman, 2000), embed feedback for learning, and test decision rules before deployment

The QRIS payment service is now available nationwide in Indonesia, enabling payment systems that work across various institutions (Bank Indonesia, 2024). The payment platform also has a capability for customization, specifically personalized payment for zakat donors. A vast body of literature indicates a clear consensus that donor retention is important. That the quality of a relationship leads to loyalty, and that personalization and digital rails can improve giving outcomes. What remains unresolved and drives this study is how to (a) utilize personalized QRIS data within zakat institutions, (b) translate relationship-marketing constructs into decision rules for acquisition and churn in strategic resource management as a strategic resource-based view (RBV), and (c) develop a theoretical model/framework for muzakki retention strategy.

Relative to prior research that links personalization to higher engagement, our contribution is twofold. First, we demonstrate these effects on interoperable QRIS strains within an Islamic social finance setting, which is rarely examined. Second, we quantify both a system-level frequency gain and a measurable shift in donor status composition, positioning the donor base as a strategic stock that can be actively managed for retention-driven growth, even when average ticket sizes remain modest.

III. METHODOLOGY

The study uses a customized QRIS as a transaction interface between the donor and the zakah institution. QRIS was selected because each code is reusable, does not expire, supports unlimited transactions, and can be scanned by any payment app with a quick and low-effort setup. The QRIS platform streamlines the payment process for donors by eliminating the need to manually enter account numbers or confirm payments, reducing bank transfer fees, and enabling micro-donations as low as Rp 1. Each donation record includes a timestamp, amount, intended program, and a pseudonymized donor ID, allowing the institution to track behavior without exposing identities.

Transactions are automatically routed to the intended program under a pseudonymous donor ID, with instant notifications and automated receipts for traceability. Donors can generate QRIS codes for multiple programs and share them with family or friends, widening outreach. From these, the study develops two views: a monthly donor-by-time panel (to track acquisition, retention, and reactivation) and an event-level file to examine when donors cease giving.

The study also developed a simple system dynamics model, adapted from Bass's adoption of innovation, to hypothesize the structure of the donor base as it evolves over time. The stock of active Muzakki increases through two inflows (acquisition of new donors and reactivation of lapsed donors) and decreases through lapses of inactivity. Personalized QRIS payments are represented as decision rules that affect these flows via two feedback loops: (i) a reinforcing loop in which improved donor experience raises retention, enriches donor-to-program data, and in turn enables better personalization; and (ii) another reinforcing loop in which increases engagement for passive donors which amplifying the reactivation loops. This approach is chosen because donor retention is shaped by feedback, delays, and nonlinear responses; a feedback-explicit model makes these mechanisms testable and transparent.

To build confidence and credibility, the model was assessed with complementary empirical checks. First, we assessed boundary adequacy to ensure that the personalized QRIS intervention is modeled endogenously. Second, the consistency of structural behavior was tested by comparing key relationships to prior literature and the institution's actual implementation data. Notably, QRIS personalization is modeled as a transaction-stage trigger (it operates only when a donation occurs), in contrast to advertising, which can cause transactions. In addition, targeted tests were conducted on

specific flows (e.g., becoming active donors, becoming passive donors) with pre-specified outcome metrics to confirm reasonable behavior. Finally, model predictions were compared to the institution’s observed data and calibrated parameters only within plausible ranges. This mixed approach yields three benefits: (1) a clear explanation of why behavior changes (feedback structure), (2) credible estimates of effect size (causal and predictive validity), and (3) a safe, ex-ante environment to test policies before wide rollout.

IV. RESULTS AND DISCUSSION

Figure 1 shows the stock and flow structure indicating the dynamic hypothesis of the main resource in the zakat institution, which is the donor base (muzakki). In line with the Bass model, Potential Donors become Active Donors through two pathways: advertising loop (B1) and word of mouth loop (R1). In B1, adoption depends on advertising effectiveness but faces diminishing returns as the reachable audience shrinks, producing a balancing (saturation) effect. In R1, Active Donors are assumed to be in contact with Potential Donors at a contact rate (c), and a share of those contacts adopt with adoption fraction (i). More active donors lead to more contacts, which in turn lead to more adopters. A reinforcing process that accelerates growth until market saturation slows it down.

Individuals move from *Potential* to *Active Donor* through the inflow, becoming active donors. Due to inactivity, some users then transition from Active to Passive via the *Becoming Passive Donor* process, governed by the average inactivity (attrition) threshold. Passive donors can be re-engaged and transition back to Active status through reactivation, prompted by advertising, personalized nudges, or other motivating factors. Donations come from three streams: the *Initial Donation Rate*, which applies to new active donors; the *Repeat Donation Rate*, which applies to current active donors; and the *Reactivation Donation Rate*, which applies to donors who have been inactive but decide to donate again after re-engagement. Together, these sum to the Total Donation Rate.

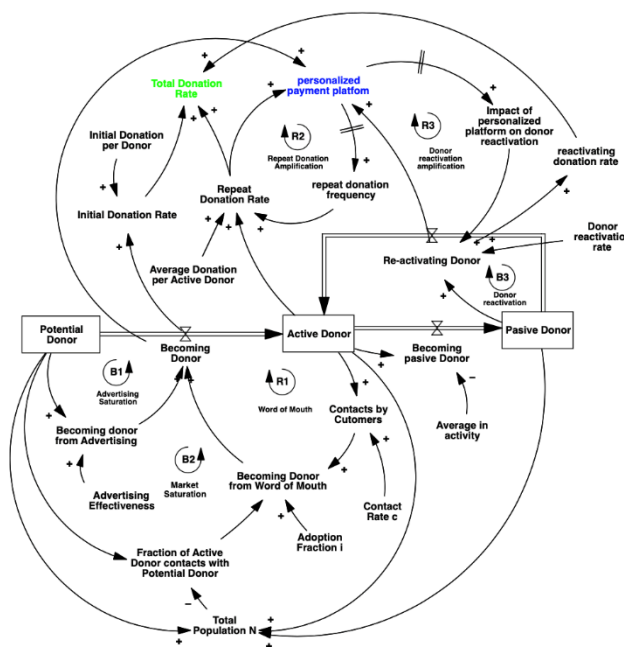


Figure 1. Stock and Flow Diagram of Donor Adoption

The personalized payment platform operates at all three transaction points (Initial, Repeat, and Reactivation) and generates two reinforcing effects. First, repeat-donation amplification (R2), where the platform increases both repeat frequency and average donation per active donor, thereby strengthening satisfaction and making subsequent repeats more likely. Second, the reactivation amplification (R3) raises the reactivation rate. Together, R2 and R3 expand the active donor base, aiming to increase the Total Donation Rate and stabilize revenue by converting first-time and lapsed donors into habitual givers.

The results show that personalized QRIS primarily stimulates high-frequency, small-ticket amount donations. In 2025, QRIS accounted for 27.02% of all transactions but only 8.08% of total funds, indicating an average ticket of approximately 30% of the overall average.

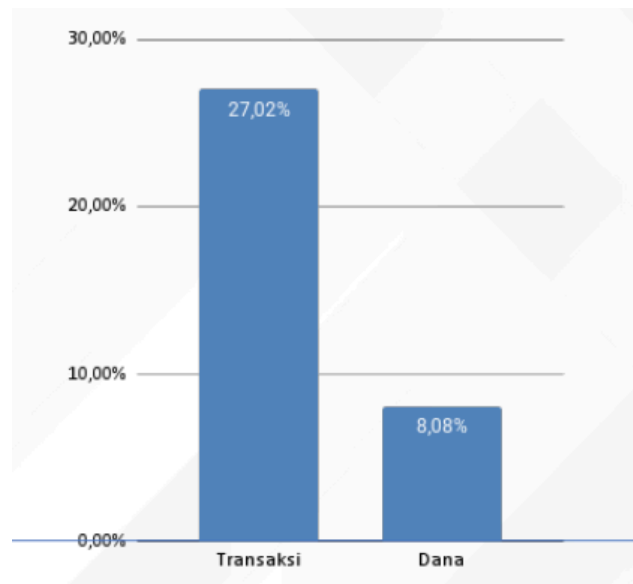


Figure 2. Transaction Number and Donation Value using personalized QRIS in 2025

The donation frequency per donor (in **Figure 3**) increases to 6.14 via QRIS in 2025, up from 4.71 in 2024. Donation frequency was 4.31 (in 2022) and 4.88 (in 2023), indicating roughly a 30% increase over the nearest pre-period. The empirical patterns are consistent with the stock–flow structure of the model. Personalization introduced at QRIS touchpoints increased perceived service quality and donor commitment, triggering the reinforcing pathway anticipated in the model. Better experience leads to higher retention due to richer interaction data further gains in personalization quality. In practice, this loop dominated the countervailing balancing loop from message fatigue. We observed sustained improvements in retention and repeat-giving alongside growth in the volume and depth of interaction data, without a corresponding rise in churn attributable to messaging frequency.



Figure 3. Historical Average Transaction Frequency per Donor

Donor status composition (in Figure 4) also improves, with 25.81% active and 23.11% returning/reactivated. As hypothesized earlier, since the personalized QRIS is involved in the transaction process, personalization at transaction touchpoints enhances perceived service quality and commitment. It creates a reinforcing loop that fosters a better experience and richer interaction data, leading to higher retention and, furthermore, more effective personalization. It appears that the mechanism counterbalances the effects of message fatigue that typically occur in communication with the donor. The small share of passive donors (2.55%) also suggests that cadence controls were adequate, allowing the frequency to rise without eroding engagement. While a small share of new donors (4.48%) might suggest that the platform functions more as a retention and reactivation lever than a pure acquisition tool.

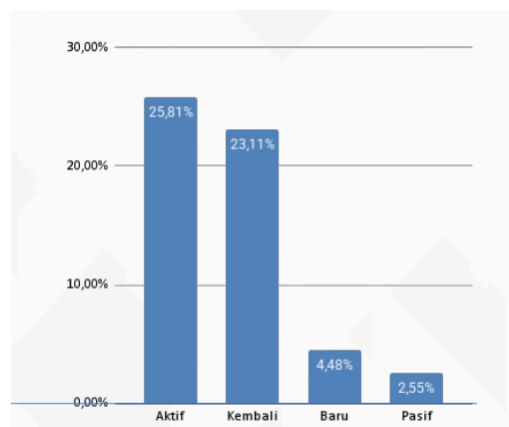


Figure 4. Donor Status using personalized QRIS compared to the total donors

The evidence shows that personalized QRIS empowers donors to choose which program to support at any stage (initial, repeat, or reactivation donation rate), with suggested options and amounts based on their recent giving history. By linking QRIS logs and the Muzakki Resource Management (MRM) under a single pseudonymized donor ID (for example, a phone number) and running ongoing A/B tests with preset outcomes, strategies can be adjusted continuously. From a resource-based view, these simple routines (personalization, data integration, and continuous model testing) build a donor retention strength that is valuable, hard to imitate, and key to long-term zakat collection and distribution performance.

V. CONCLUSION AND RECOMMENDATION

This study set out to answer whether a QRIS payment platform can be used to (1) simplify the transaction process while identifying donors, (2) grow and stabilize the donor base (Active Muzakki), and (3) lift zakat collection through higher acquisition, retention, and reactivation of muzakki. The results demonstrate clear and consistent effects on behavioral frequency and muzakki composition. Personalized QRIS achieves approximately a 30% increase in donation frequency, a larger share of active and returning donors, and a smaller share of passive donors. Taken together, these findings support the stock-and-flow explanation that personalization enhances perceived service quality and commitment, thereby reinforcing retention while minimizing message fatigue. Personalized QRIS also contributes disproportionately to transactions relative to funds, revealing a high-frequency, small-ticket profile typical of micropayments. This mix is valuable for stabilizing inflows even when average donation sizes are modest.

The following recommendations could help regulators to preserve trust while accelerating the adoption of digital payment platforms in practice. Several key actions can amplify these gains: (i) maintain interoperability and data standards for donor-safe identifiers and campaign tags across providers; (ii) issue consent and privacy templates tailored to philanthropic use, enabling lawful personalization while protecting donors; (iii) encourage reporting baselines so institutions can benchmark fairly; and (iv) support sandbox trials where zakat organizations can test personalization variants on QRIS rails with light-touch oversight.

The analysis in this study was based on a single institution; to test external validity and persistence, multi-institution research could be conducted. While this study pairs system dynamics with quasi-experimental methods, fully randomized field experiments could sharpen dynamic hypotheses and quantify spillovers across payment channels. Heterogeneity also warrants further investigation through uplift modeling to identify and target the highest-retention segments in an ethical manner. Linking behavioral outcomes to distribution-side impact metrics would connect personalization not only to fundraising performance but also to a greater social impact.

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