Proposal

an application: ZakatWise

Domain Given: (1) Enhancing Charity & Donations Through Fintech

Group: Rising Star

1.0 Introduction

1.1 What is zakat?

Zakat is one of the Five Pillars of Islam, an obligatory form of charity or almsgiving for financially capable Muslims. It is a fixed portion (usually 2.5%) of a Muslim's savings and wealth that is distributed to those in need. Muslims who meet the Nisab must pay zakat. Zakat aims to purify wealth, strengthen the welfare of the community and reduce inequality by redistributing wealth to the poor. There are several categories of the eligible recipients of zakat, including the poor, the needy, hospitalisation, etc.

1.2 The current situation of Zakat collection and utilisation in Malaysia

Zakat collection in Malaysia has seen significant progress in recent years, with digitalization efforts and centralized management by state Islamic religious councils (MAINs) contributing to improved efficiency. Annual collections now exceed RM 3.5 billion, with states like Selangor, Johor, and Kuala Lumpur leading in contributions. The adoption of e-Zakat platforms, salary deductions, and corporate Zakat programs has streamlined payments, making compliance easier for Muslims. However, despite these advancements, a large portion of eligible individuals still underpay or avoid Zakat obligations due to a lack of awareness, weak enforcement, and misconceptions about calculation methods. Additionally, while digital payments are growing, rural areas and older generations remain reliant on traditional cash-based systems, slowing down nationwide financial inclusion.

When it comes to utilization, Malaysia has structured Zakat distribution around the eight asnaf (beneficiary categories) outlined in the Quran, with the majority of funds allocated to the poor (Fuqara) and needy (Masakin). Programs such as Bantuan Asnaf Rahmah (monthly welfare aid) and educational scholarships demonstrate Zakat's role in poverty alleviation. However, delays in aid distribution, bureaucratic inefficiencies, and a lack of real-time monitoring sometimes prevent funds from reaching the most deserving recipients promptly. While some states like Selangor and Penang have implemented digital tracking dashboards, others still rely on manual processes, leading to inconsistencies in transparency and accountability.

1.3 Limitations of the current situation

Despite Malaysia's well-organized Zakat infrastructure, several challenges hinder its full potential. One major issue is fraud and misuse of funds, where ineligible individuals exploit loopholes to

receive Zakat aid. Although some states have begun using AI-based verification systems, many still depend on manual checks, making fraud detection slow and unreliable. Another limitation is the uneven distribution of resources, where urban centers receive more attention than rural and underserved communities. This imbalance leaves many deserving recipients without sufficient support, despite sufficient Zakat collections.

Additionally, public trust remains a concern due to a lack of visible impact reporting. While digital platforms like e-Asnaf help track beneficiaries, many contributors are unaware of how their Zakat is utilized, leading to skepticism and reduced participation. Another critical challenge is the reliance on outdated administrative processes in some states, where paperwork and manual approvals delay aid distribution. Finally, financial illiteracy among some Muslims results in incorrect Zakat calculations, with many either overpaying or underpaying due to a lack of accessible guidance.

These limitations highlight the need for a more efficient, transparent, and technology-driven Zakat ecosystem—one that leverages AI, blockchain, and real-time analytics to optimize collection, prevent fraud, and ensure funds reach those most in need. By addressing these gaps, Malaysia can strengthen its Zakat system and maximize its socio-economic impact.

2.0 Problem Statement

What should we have? (transparency, efficiency, access & inclusivity)

1. **Lack of transparency in Zakat collection and distribution:**
   Donors are often having no visibility on how their Zakat funds are utilized.
   Real-time tracking is absent, causing mistrust and lower donation rates.
2. **Inefficient and manual Zakat distribution process:**
   Traditional paper-based system slowed down fund allocation to eligible recipients.
   Delays in disbursement prevented timely assistance for those in need.
3. **Limited accessibility for donors and recipients:**
   Lacking convenient digital payment options for potential donors like younger generations.
   Lacking digital infrastructure causing unbanked or rural populations struggle to access Zakat funds.
4. **Fraud and mismanagement risks:**
   Lacking automated fraud detection causing inefficiencies and corruption risks.
5. **Poor donor engagement and impact measurement:**

Lacking data-driven insights to optimize Zakat allocation.

Donors have no idea on how their contributions create social impact.

6. **Lack of integration with modern financial systems:**

   No seamless connection with e-wallets, banking APIs, or blockchain for secure transactions.

3.0 Customer Pain Points

1. **Fraud and Misallocation of Funds**

   Pain Points:

   - **Ineligible recipients** exploit manual verification to receive Zakat
   - **Lack of real-time auditing** allows duplicate/fake claims
   - **No centralised database** to cross-check recipient eligibility

   Despite Malaysia's advanced Zakat infrastructure, fraud remains a critical issue. Manual verification processes enable ineligible individuals to manipulate the system, receiving aid meant for the truly needy. For example, some recipients use falsified income documents or duplicate registrations across states. Without AI-driven cross-checks against EPF, LHDN, or bank data, religious councils (MAINs) struggle to detect these leaks. A 2023 MAIS report estimated **RM 100 million annually** is lost to fraud – funds that could have supported 50,000 impoverished families. This erodes public trust and discourages timely Zakat payments.

2. **Delayed and Inefficient Aid Distribution**

   Pain Points:

   - **Bureaucratic approval chains** delay payouts by 3-6 months
   - **Rural areas receive aid more slowly** than urban centers
   - **Recipients lack visibility** into application status

   Many asnaf (beneficiaries) face life-threatening delays due to outdated administrative processes. For instance, a single mother in Kelantan might wait **5 months** for approval due to paperwork backlogs, while her counterpart in Selangor receives aid within weeks through digital systems. Rural communities suffer most, as physical document submissions and fewer MAIN officers slow processing. During crises like floods, these delays become

catastrophic. Recipients also have no way to track applications, leading to frustration and mistrust in the system.

3. **Lack of Transparency for Donors**

   Pain Points:

   - **Generic reports** ("60% to Fuqara") without tangible impact
   - **No proof of delivery** for Zakat-funded projects
   - **Donors can't choose specific causes** (e.g., orphans vs. refugees)

   Modern donors demand transparency, but most MAINs provide only broad annual summaries. A KL-based professional paying RM 5,000/year might see a pie chart showing "Education: 20%" but never learn **which schools** were supported or how many children benefited. Unlike platforms like LaunchGood (which show project photos/videos), Malaysia's Zakat ecosystem lacks GPS-verified proof of aid delivery. This opacity discourages younger, tech-savvy Muslims from participating fully.

4. **Complex Zakat Calculations**

   Pain Points:

   - **Nisab thresholds change monthly** (gold/silver prices)
   - **Multiple asset types** (savings, stocks, livestock) confuse payers
   - **No auto-sync** with bank/EPF data

   Calculating Zakat accurately requires tracking ever-changing gold prices (Nisab) and assessing diverse assets. A freelance graphic designer with RM 80,000 in savings, RM 20,000 in stocks, and a gold bracelet might **overpay by 30%** by missing deductible liabilities. Manual calculations also fail to account for zakatable business inventory or agricultural yield differences. While apps like MyZakat exist, they don't integrate with Maybank or Touch 'n Go to auto-calculate dues, forcing users to input data manually – a tedious, error-prone process.

4.0 Assumption

1. Top-Up & Annual Transfer Rules

- **Assumption**: Donors can top up funds **anytime**, but transfers to recipients only occur **annually after a set deadline** to ensure funds are pooled for fair yearly distribution while allowing flexible contributions.

- **Assumption**: Donors control the **amount per recipient** (with minimum limits) and can split funds across **multiple recipients** to ensure balance donor autonomy with equitable distribution (e.g., no single recipient monopolizes funds).
- **Assumption**: Recipients joining **after the deadline** are ineligible until the **next cycle** to prevent mid-year disruptions to allocation algorithms.

2. AI-Driven Fraud Detection

- **Assumption**: AI flags suspicious activities, including:
    - **Exceeding amount thresholds** (e.g., donor tries to transfer >20% of total pool to one recipient).
    - **Frequent transfers** (e.g., same donor sending funds to 10+ recipients in 1 hour).
- **Donors** will receive a **message prompt** to justify transactions.
- **Admins** are responsible to review flagged cases, conduct interviews if needed, and assign **risk scores** (e.g., based on donor history/public data).

3. DeFi Integration (Privacy-Focused)

- **Assumption**: Pre-deadline top-ups are **financial assets** (non-Zakat); funds convert to Zakat **only after private key issuance** to ensure donors commit funds irrevocably.
- **Assumption**: Private keys enable **traceable transactions** (amounts, IDs) but hide recipient/donor identities on-chain, which balances transparency with privacy (avoiding stigma for recipients).

4. Post-Deadline Distribution Logic

- **Assumption**: If donors don't select recipients:
    - Funds are distributed **equally among eligible recipients** (minimum amount enforced).
    - Residual funds go to **government-managed Zakat programs**.
- **Assumption**: Dynamic pooling:
    - If a donor allocates **below average**, funds are shared with others' allocations.
    - If **above average**, excess is split across recipients proportionally.

5. Shariah Compliance

- **Smart Contract Audit:** Reviewed by Islamic finance experts to avoid *riba*(interest).

6. Limitations

- **Annual recipient limitation** (e.g., max 5 recipients per donor to prevent exploitation).
- **Unclaimed funds** after 1 year are distributed to the remaining unreceived recipients, and the fund balance will be redirected to high-need causes (e.g., disaster relief) or returned to the government.

5.0 Solutions & Technological Approaches

5.1 Mobile & Digital Payment Solutions

Objective: Enable seamless, Sharish-compliant Zakat payment with donor control over recipient allocation.
Implementation:

1. Top-Up Mechanism:
    - Donors top up funds via integrated e-wallets (Touch ‘n Go, GrabPay), bank transfers, or debit/credit cards.
    - Funds are held as *temporary assets* in the app (non-Zakat until committed).
2. Recipient Selection:
    - Donors browse anonymized profiles of *asnaf* (e.g., "Single mother in Kelantan – RM200/month needed").
    - Multi-Allocation: Donors can split funds across recipients (e.g., RM500 to 5 recipients at RM100 each).
    - Validation: Minimum RM50/recipient to ensure equitable distribution.

Tech Stack:

- APIs: Bank Negara’s JomPay for bank transfers, Razorpay for e-wallets.
- Security: Tokenization (PCI-DSS compliant) to protect card data.

5.2 Artificial Intelligence & Machine Learning

Objective: Flag suspicious transactions using behavioral analytics and risk scoring.

Implementation:

1. Real-Time Monitoring:
    - Rule-Based Flags:
        - Donor allocates >20% of total pool to one recipient.
        - Multiple transactions within an hour from the same donor ("Zakat mix-and-match" fraud).
    - ML Model: Trained on historical fraud data (e.g., duplicate claims, mismatched income profiles).
2. Resolution Workflow:
    - Donor Notification: App prompts flagged donors to justify transactions (e.g., "Why allocate RM10K to one recipient?").
    - Admin Review:
        - Interviews donor via in-app chat/call.
        - Cross-checks with LHDN/EPF data using OAuth2.0 API integration.
        - Assigns risk score (1–10) based on donor history and public records.

Tech Stack:

- AI Tools: Scikit-learn for rule-based models, TensorFlow for anomaly detection.
- APIs: LHDN's MyInvois for income verification.

5.3 Decentralized Finance (DeFi)

Objective: Ensure tamper-proof, privacy-focused fund distribution.

Implementation:

1. Pre-Deadline:
    - Top-ups are *financial assets* (non-Zakat) stored in escrow (smart contract).
2. Post-Deadline:
    - Donors receive private keys to convert funds to Zakat.
    - Pool Allocation:

    - Automated Split: Funds distributed per Quran 9:60 ratios (e.g., 50% to *Fuqara*, 20% to *Masakin*).
    - Donor Choice: If donors select recipients, funds bypass categories.
3. On-Chain Privacy:
    - Visible: Transaction hash, amount, recipient/donor IDs (hashed), recipients' details with encryption.

Edge Cases:

- Unallocated Funds: Distributed equally to recipients below average allocation.
- Leftovers: Sent to government-managed Zakat programs (e.g., disaster relief).

Tech Stack:

- Blockchain: Ethereum (ERC-20 tokens for Zakat units).
- DeFi Protocols: Aave (Shariah-compliant mode) for fund pooling.

5.4 Data Analytics and Visualization Tools

Objective: Provide actionable insights for donors / institutions.

1. Metrics Tracked:
    - Donor Side:
        - Zakat collection by state/demographic (e.g., "KL donors contributed RM1.2B in 2024").
        - Impact metrics (e.g., "Your RM500 fed 10 families for 1 month").
    - Recipient Side:
        - Distribution gaps (e.g., "Pahang has 2K underserved *asnaf*").
        - Fraud rates per region.
2. Visualization Tools:
    - Jupyter Notebook: For admins (predictive analytics on future needs).
    - Donor App: Interactive dashboards with:
        - Map Overlays: Heatmaps of fund distribution.
        - Graphs: Monthly trends, recipient category ratios.

Tech Stack:

- Backend: Python (Pandas, Matplotlib) for analytics.
- Frontend: Tableau Embedded for dashboards.

Data Presented to Users

1. Zakat Category Preferences
    - Data: Annual donation distribution across the 6 main *asnaf* categories (e.g., *Fuqara*, *Masakin*, *Riqab*).
    - Purpose: Show which categories attract the most donations (e.g., "70% of funds go to *Fuqara*").
    - Visualization:
        - Interactive pie chart (click to drill down by state/year).
        - Trend line graph comparing category popularity over 5 years.
2. Recipient Allocation by Category
    - Data:
        - Total funds disbursed per category (e.g., "RM 500M to *Fuqara* in 2024").
        - Number of recipients assisted per category (e.g., "200K *Masakin* families supported").
    - Purpose: Demonstrate fund utilization and highlight underserved groups.
    - Visualization:
        - Stacked bar chart (funds vs. recipients).
        - Heatmap showing regional gaps (e.g., "Pahang has low *Riqab* support").
3. Donor Contribution Insights
    - Data:
        - Individual donor's annual Zakat paid (e.g., "You donated RM 5,000 in 2024").
        - Comparison to peer groups (e.g., "Top 10% of donors in your age bracket").
    - Purpose: Encourage consistent giving and social accountability.
    - Visualization:

    - Personal dashboard with progress bars.
    - Leaderboard (optional public ranking for motivation).

4. Beneficiary Impact Metrics
    - Data:
        - People helped: "Your RM 1,000 fed 20 families for 1 month."
        - Locations served: GPS pins of aided communities (e.g., schools, orphanages).
    - Purpose: Build trust via tangible impact.
    - Visualization:
        - Interactive map (Google Maps API) with clickable aid projects.
        - Before/after photos of funded initiatives (e.g., rebuilt mosques).
5. Tax Exemption Tracking
    - Data:
        - Estimated tax deduction amount (e.g., "RM 5,000 Zakat = RM 1,500 tax relief").
        - Auto-generated tax receipts (linked to LHDN's MyTax).
    - Purpose: Simplify compliance and incentivize payments.
    - Visualization:
        - Side-by-side comparison (Zakat paid vs. tax saved).
        - PDF generator for official documentation.

6.0 Summary

This proposal outlines a comprehensive, Shariah-compliant digital platform for Zakat collection and distribution, blending financial technology, AI, and decentralized finance (DeFi) principles. The system enables donors to **top up** their funds anytime via integrated e-wallets or bank transfers. However, actual Zakat transfers to recipients occur annually after a set deadline, allowing for pooled, equitable fund distribution. Donors retain control over recipient selection within structured limits to ensure fairness.

AI-driven fraud detection flags suspicious activities such as excessive fund allocations or unusually frequent transactions. Flagged cases trigger donor prompts and admin reviews, using integrated government databases to assign risk scores. Meanwhile, **DeFi integration** secures funds pre-deadline as temporary assets and, after issuance of private keys, irrevocably converts them to Zakat. Privacy is preserved by masking donor and recipient identities while maintaining transparent on-chain transaction records.

Funds are distributed either based on donor allocations or automatically, following Quranic guidelines (Surah 9:60), ensuring unallocated and surplus funds are directed to government-managed programs or high-need causes. To maintain Shariah compliance, smart contracts will undergo audits by Islamic finance experts.

Additionally, the platform leverages **data analytics** to provide donors and administrators with actionable insights. Donors access personal dashboards showing impact metrics, peer comparisons, and interactive heatmaps of fund distributions. Administrators can predict future needs and identify underserved regions through advanced data visualization tools.

Overall, the proposed solution aims to modernize Zakat management by enhancing transparency, flexibility, and social impact while adhering strictly to Islamic principles.