A Blockchain Payment System in Enhancing Hong Kong Philanthropy Transparency

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BACKGROUND

In Hong Kong, the philanthropy market has a total of 13bil of donation per year with over 10,000 charities. However, the **lack of regulation and transparency in Hong Kong** has been detrimental to the growth of the philanthropy landscape.

- **No government regulatory body on charities**
- **No compulsory reporting framework**
- **No laws on regulating fund use**

→ **Public Mistrust**

→ **Credibility Issue**

OBJECTIVES & MOTIVATION

Blockchain-based Donation System

Higher degree of transparency and trust among stakeholders

Making donations traceable to all parties through blockchain system

Provide accountability for stakeholder

Using digital signatures to authorize designated individuals to receive funds

Allow donors to monitor the use of fund → Build donors confidence → Gain visibility and build trust → **More donation**

METHODOLOGY

Literature Review

Paper	Blockchain	Smart Contract	Stakeholders	Architecture
Smart Donations: Event-Driven Conditional Donations Using Smart Contracts On The Blockchain (Trotter et al., 2020)	- **Private Permissionless** - Ethereum	- Token Contract - Donation Contract Template - **Escrow system**	- Donor - Trustees - Beneficiary - Validators	- On-chain: Smart contract - Off-chain: data storage, currency exchange, third-party plugins - Mobile app
Blockchain-based donations traceability framework (Almaghrabi & Alhogail, 2022)	- **Public Permissioned** - Ethereum	- **Solidity** - "join" - "charity" - "wallet"	- Donor - Needy party - Trustee	- On-chain: Smart contract - Off-chain: data storage (InterPlanetary File System) - Web portal
Smart Blockchain Networks: Revolutionizing Donation Tracking in the Web 3.0 (Nairi et al., 2024)	- Ethereum	- **Solidity** - "DonationEvent" contracts - "DonationTracking" contracts	- Donation event owner - Donor - Validators	- Polygon network - Crypto Wallet - **Escrow system** via Web API - InterPlanetary File System

Chosen Architecture

- **Public Permissioned Ethereum Blockchain**
- **Solidity Smart Contract**
- **Escrow System**
- **Charity Token (ERC-20 token standard)**

Prototyping

System Framework

- Define Functions and User Journey
- Design Blockchain system (Smart contract, Digital signature, Token)
- System architecture (On-chain, Off-chain, Visualization)

User Interface Design

- User Experience
- Website Design

Evaluation

Performance Evaluation

Evaluate performance from **four perspectives**
- Transparency
- Accountability
- Trust
- Immutability

Bench-marking

Comparing our system with current online donation system in Hong Kong (Eg: Po Leung Kuk, The Community Chest of Hong Kong)

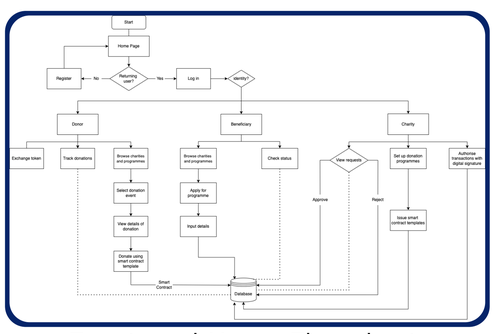
Questionnaire

Gather feedbacks from Hong Kong users after reviewing our proposed system

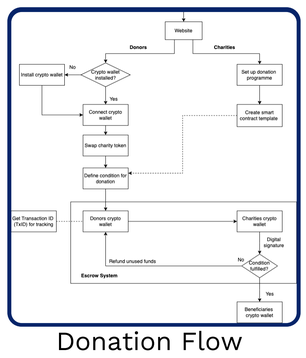
Project Outcome

SYSTEM DESIGN

We designed the flow of the system with reference to existing studies and platforms. It serves as the base of our prototype development. Our main focus is on the donors, how they will be able to browse, donate and track donations on the platform.



Front-end Users Flowchart



Donation Flow

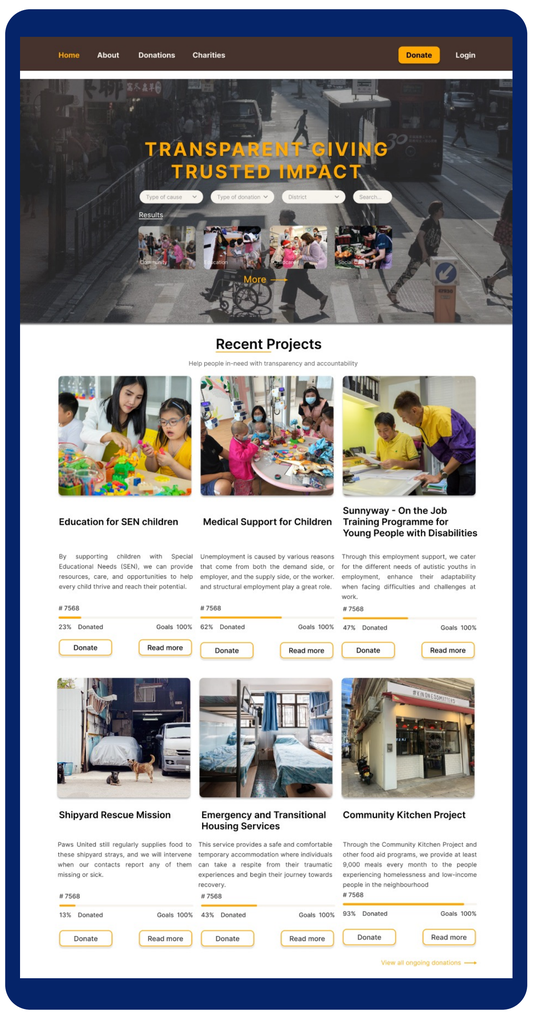
Scan this QR code to see our final demo of the Blockchain-based Donation System.

SYSTEM DEMO

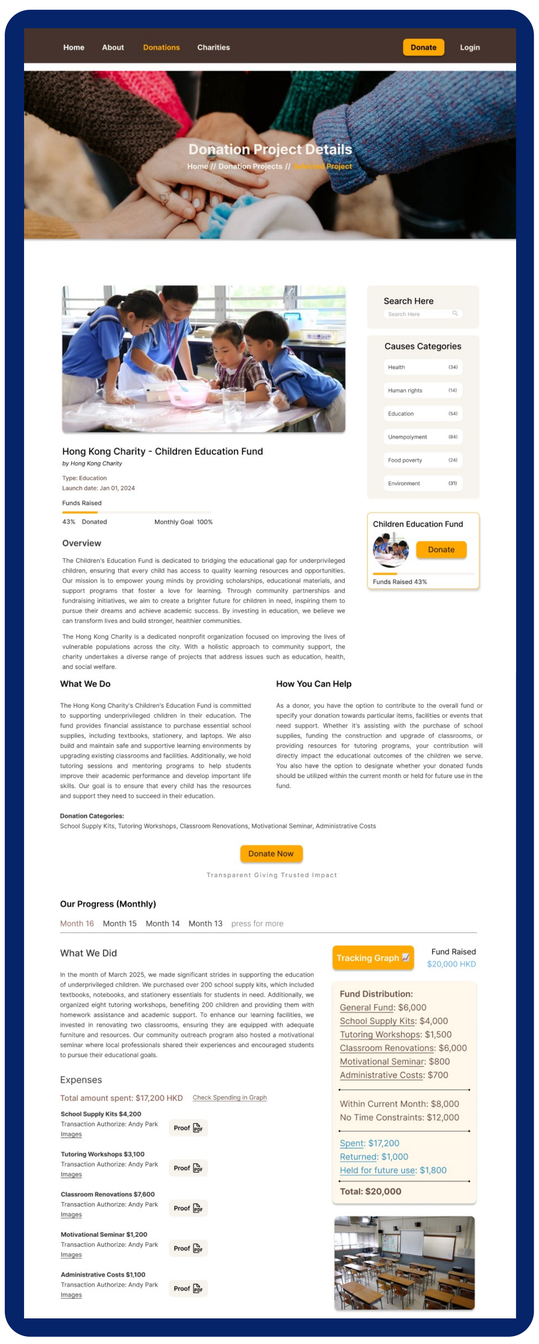
WEBSITE DESIGN

Main features of the system:

- Browse charities and projects
- Check donation project details
  - Tracking graph
  - Transaction history
- Donate

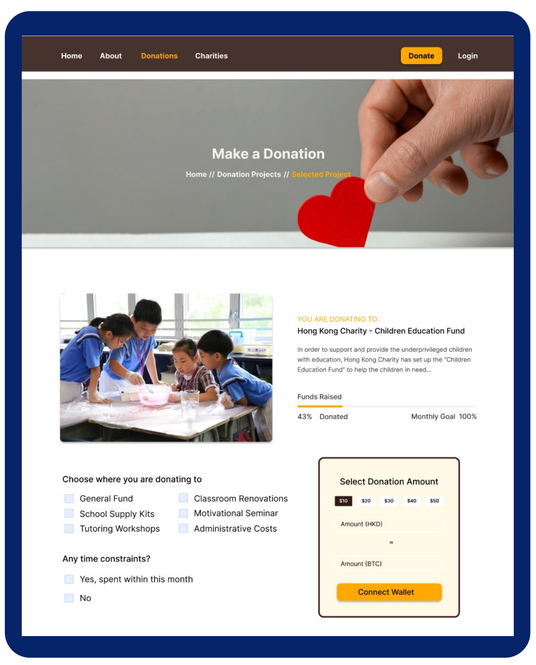


Home Page



Donation Project Page

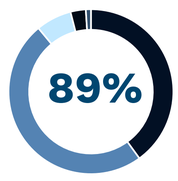
Tracking Graph & Transaction History



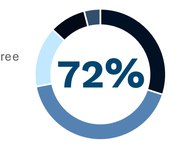
Donate Page

QUESTIONNAIRE KEY RESULTS

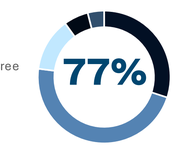
We collected a total of 127 responses from an age range of 20-64.



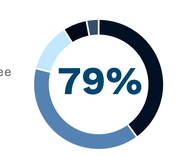
Agrees that the system helps to raise transparency in Hong Kong charity donations



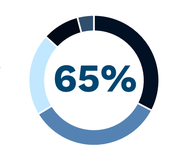
Agrees that the system would enhances their trust towards Hong Kong charities



Agrees that the system enhances their trust towards Hong Kong charities' use of donations



Agrees that the system encourages them to donate more to Hong Kong charities



Likely to support or participate in donating through a blockchain donation system

CONCLUSION

The regulatory gaps within the Hong Kong philanthropy landscape have led to malpractices among charitable organizations, significantly undermining public trust and adversely affecting the overall credibility of local charities. However, this lack of oversight has also created opportunities to explore innovative donation methods that could bridge these gaps.

By integrating blockchain technology and digital signature, we propose a donation payment system aimed at enhancing transparency, accountability, and trust within local charities.

Throughout this project, we have developed the backend architecture and designed a front-end webpage on top of that. To gain insights into user perceptions, we conducted a questionnaire to gather feedback that informs our project's direction. The responses indicated overall positive reactions from users, and the demo of the blockchain-based donation system demonstrated its effectiveness in enhancing transparency and trust in Hong Kong charities. However, further development is needed to refine the system and ensure user experience is optimized and fully meets the needs of both donors and charities.

Ultimately, it is our sincere hope that this initiative can foster a transformative shift in charity payment systems and contribute to a more credible philanthropic environment in Hong Kong.

ACKNOWLEDGEMENTS

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