

# HASHFUNDS A DECENTRALIZED FUNDRAISING APPLICATION USING BLOCKCHAIN

Vishnu Prasad E S

*Dept. of Computer Science And Engineering  
St Joseph's College of Engineering and Technology  
Palai, Kerala  
vishnuprasades2001@gmail.com*

Shalom Aby Abraham

*Dept. of Computer Science And Engineering  
St Joseph's College of Engineering and Technology  
Palai, Kerala  
abrahamshalom18@gmail.com*

Rahul Rajeev

*Dept. of Computer Science And Engineering  
St Joseph's College of Engineering and Technology  
Palai, Kerala  
rahulrajeev9828@gmail.com*

Terin Mathew

*Dept. of Computer Science And Engineering  
St Joseph's College of Engineering and Technology  
Palai, Kerala  
terinmathew2410@gmail.com*

Prof. Angitha George

*Dept. of Computer Science And Engineering  
St Joseph's College of Engineering and Technology  
Palai, Kerala  
angitha.george@sjcetpalai.ac.in*

**Abstract**—Beneficiaries are unsure how the donated money will be spent. Charities are vulnerable to the same types of fraud that plague businesses, such as embezzlement and misuse of funds by management. Recently, blockchain technology has been implemented in various fields. Through the use of blockchain technology, money can be sent and received more efficiently transparent. It explains how a blockchain-based system for tracking donations can be created. With System, donors, Charitable Foundations, and recipients are able to keep track of transactions using blockchain technology. Contributors and public users should have access to a transparent posting channel on the charity platform.

**Index Terms**—Smart contract, Ethereum, Blockchain, Transactions

## I. INTRODUCTION

A democratic society is built on charity. Many scenarios are well-known to occur in this world that lead to catastrophic losses. The old system had many flaws, including lack of transparency, mistrust of donors, and corruption. The following are the main concerns we currently have with the Charity Platform.

- **Security:** To maintain electronic payments as secure as possible but still susceptible to hackers, tight methods like symmetric encryption should be used. The more the money, more secure they must be. Blockchains have never been hacked, which is why they can offer this level of security.
- **Transparency and anti-fraud measures:** We have witnessed many crowdfunding scams and will continue to do so. There is no way to track how the funds are spent. We needed visibility across cash flow at all levels to ensure funds were not misappropriated or used.

- **Global contribution:** Certain platforms are country-specific, so it can be difficult for people from different countries to participate in different initiatives. Anyone in the world can contribute to the campaign via blockchain. Transactions are quick and easy. We were very inspired by the CryptoRelief campaign where they raised 1 billion in a very simple way from the entire global community for Covid Relief in India.

## II. OBJECTIVE AND SCOPE

The project seeks to create a decentralised economy centred on microcommunities where people may trade assets with one another using tokens. Tokens that represent the value of the exchanged assets are used to complete trades. Tokens will be awarded to those that add value to the system. The value of the token rises for all holders as the network expands. This helps to create sustainable, equitable economic networks with a fair distribution of revenues.

This paper propose solutions that enable value-based trading networks. Several blockchains are active at once on the network. With the aid of its own set of guidelines and tokens, any service can act as its own parachain. Through relay chains, the services communicate with one another and share data.

A single entity now controls the entire planet. Imagine a network of organisations that can self-regulate and are completely trustworthy of one another. This is the main idea of Bloc Network, a decentralised blockchain network that permits secure transactions between businesses and people. Support in creating micro-communities of various sizes and ensure interoperability.

### III. LITERATURE SURVEY

#### A. Blockchain Technology

The decentralised, secure, confidential, and accessible blockchain technology that underpins Bitcoin has the potential to significantly alter existing industries. A system of distributed databases with numerous autonomous nodes is called blockchain. Network-wide nodes are responsible for managing the whole database[11]. The data is extremely safe, the entire procedure is fast and translucent, and blockchain is capable of recording all transaction details.

The blocks that make up a blockchain each have a block header and a block body[13]. Transactional data is contained in the block body, while block headers hold meta data. Along with a timestamp, random integer, and Merkle root, the header includes the hash value from the previous block[2]. A Merkle tree representing a number of transactions from the prior block is stored in the block body. In the Merkle tree, leaf nodes and non-leaf nodes both store the aggregate hash of all leaf nodes below them in terms of transaction information hashes[17].

Because it is based on a network of peers, the blockchain system does not need a centralised entity to verify credit[1]. Following the transaction, a consensus process is used to compete among the nodes for accounting rights. The winning node consolidates all transactions made within a specific time frame. Blocks are sent across the network and all nodes verify them. Blocks are added to the chain when most nodes are successfully authenticated[7]. Each transaction is open and transparent from beginning to end, preventing nodes from deceiving one another.

#### B. Research of Charity Platform

Liu Na researched the Chinese charity monitoring system in order to provide a proposal to monitor charities in the areas of law, administration, business, and society. Table 1 depicts the comparison of existing works. Bi Ruixiang concluded that Chinese charities disclose relatively little financial information[20]. Yu YuXi proposed limiting the power of charities by improving accountability systems and government oversight. Wang Jian and Xu Yuchao used ASP.NET technology to design a charitable donation information management system to complete charitable donation management and announcement[6].

By integrating the administration of donation fund data and the dissemination of charity information, Yang Qilin's LAMP architecture enabled the realisation of the core business system for managing charitable funds[3]. Blockchain technology was suggested by Jia Hongwei and Deng Xiuquan as a solution to the social emergency relief issue. The advantages of the use of blockchain in philanthropic operations were also affirmed by Wang Jia and Chen Haifeng, who also examined how it was used in China's charitable endeavours. The charity application system was realised using Li Qi, Li Wei, and other individuals who contributed the application model for the platform[8].

At the same duration, Rizal Mohd Nor advocated building the entire network on Ethereum and using blockchain technology to administer disaster relief funds[14]. A blockchain-based

Bitcoin charity platform was created by Dhanushka Jayasinghe that makes it possible to donate to problematic regions without internet in a safe and simple way via the GSM network[16]. On the basis of these investigations, we put out a blockchain-based proposal for a new fundraising method.

#### C. Ethereum

Ethereum is a platform that enables the creation of decentralised apps and businesses as well as asset ownership, trading, and communication. To use Ethereum, you don't have to divulge all of your personal information[3]. Your information and what gets shared with you are still within your control. Ether, an Ethereum-specific coin, is utilised to pay for some services on the Ethereum platform.

Anyone may use Ethereum to develop secure digital technology[17]. Participants may use tokens to pay for physical products and services, if approved, even if certain tokens are meant to be utilised as payment for the work required to sustain the blockchain.

Scalable, programmable, safe, and decentralised describe Ethereum. It becomes the blockchain preferred for businesses and programmers who are building technologies atop it to alter how we conduct business in a number of industries and in our everyday lives[18]. Other apps also include smart contracts into the blockchain[18]. use. Numerous decentralised financial services (DeFi) along with other apps employ blockchain and smart contracts.

### IV. PLATFORM FUNCTIONALITY

The platform's functioning is depicted for two sorts of actors (Donor and Charitable Foundation). An Overall Workflow of the platform is shown in Figure 1.

Donor functionality includes:

- Get donation information from the website. A unique identifier can be used to retrieve information about a donor's donation. Information about his fundraising flows for various companies is sent to donor.

The functionality for a charity foundation is as follows:

- Update post information. Donation information must be able to be recorded by foundations.
- The export of reports. A charity will be allowed to transmit a report based on donor information into the Ministry of Justice.

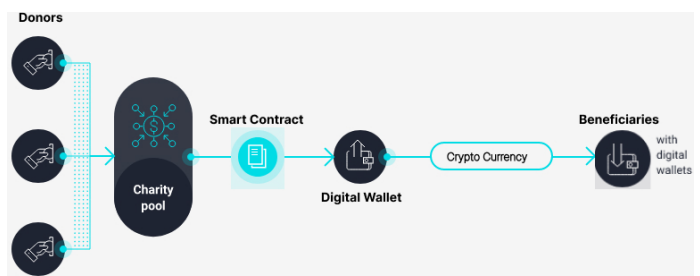


Fig. 1. Overall WorkFlow.

TABLE I  
COMPARISON OF EXISTING WORKS.

Title with Authors and Year of Publication	Method / Technology	Limitation
Jingyu Zhang[2021]:An Systematic Study on Blockchain Transaction Databases Storage and Optimization	The system makes use of the expiry identification Least Recently Used Method using the (LRU) technique, separating the dividing up cold and hot zones for blockchain addresses.	-Lack of Awareness. -Limited availability of technical talent -Immutable.
Y. Qiu[2019]:An In kind charitable donation system app design practice driven by social innovation design concept	This is an app named afu which is used to help the needy people in china.	-Verification of details by admin is not present -Donor's name is public
Wooyoung lee[2021]:A study on blockchain application in donation platform	Blockchain is a data forgery/modulation prevention technology based on distributed computing technology.. In this paper they try to introduce the block-chain technology into the donation system.	-Money limit is not present -No admin Verification
Anjaneyulu Endurthi[2021]:Cheat Proof Escrow System for Blockchain	The study primarily introduces a cheat mechanism of evidence escrow. an approach is suggested that offers security and ensures impartiality and privacy service for the vendor and buyer together with an escrow that prevents fraud.	-Nil

V. PROPOSED WORK

The planning mode for the charity scheme is shown in the diagram below. Donor and beneficiary are two responsibilities. Through the website, beneficiaries can get information on how to seek help and initiate charity work. Donors use this site to learn about the charity and donate to recipients or charities. Beneficiaries can purchase and use the tokens in the co-op store after uploading their details to her website for support. The charity platform will be updated with transaction made in-store. To collect tokens, the co-op store provide services or items to beneficiaries. Beneficiaries can exchange the tokens for real money. All money flows were recorded on the Blockchain, allowing us to monitor transactions and protect funds from fraudulent use. Figure 2 depicts the interaction of beneficiary and donor in the proposed model.

A. Process For Using the Platform

a) *Donors*: :After successfully logging in, the donor peruses charity initiatives and choose which ones to give to. Donor account balances are verified by the system. The user will get notification and a deposit if the amount is inadequate. Only a balance that is sufficient will allow donations to be made.

b) *Beneficiary*: : People who require assistance should submit the request application to the admin for assessment with approved documents being placed on the charity platform. The underlying cause will be displayed on the website when the documents are checked for authenticity. The beneficiary can use the tokens to pay for goods or services in

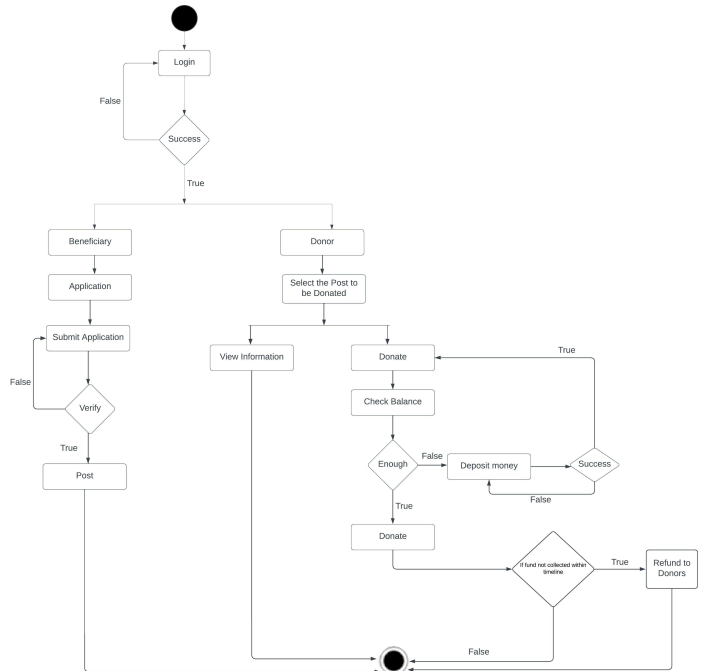


Fig. 2. Interactions in the proposed model.

cooperative stores after checking the account balance to see how the project is doing.

### B. The DApp Model

The following features have to be achieved:

1. In the DApp, Beneficiary asks for money from a charity platform.
2. The donor makes a donation to the charitable initiatives of his choice.
3. When an application for funds is approved, the money will be transferred to the beneficiary's account.

## VI. TECHNOLOGIES USED

### A. Ethereum Blockchain

Decentralised and open-source, Ethereum is a blockchain that supports smart contracts. The Ethereum protocol generates the cryptocurrency known as ether (ETH) as a payment to miners who add nodes to blockchain using a proof-of-work algorithm. Each account's ETH balance, which is expressed as an unsigned integer valued within wei (1018 wei = 1 ether), is displayed in the state. A protocol-specified amount, now  $2 \times 1018$  wei (equivalent to 2 ETH), is added to the balances of any account of the miner's choice to produce fresh ETH per block. ETH is therefore essential to the network's functionality. In a transaction, ether can be "given" from one account to another by simply deducting the amount that needs to be sent from the receiving account.

### B. ReactJS

Facebook created the open source ReactJS library and framework for JavaScript. With significantly less code than standard JavaScript, it is employed to quickly and effectively create user interfaces that are interactive and web applications.

By building reusable components that are similar to unique Lego bricks, React generates applications. These components are the individual parts of the final user interface, which together form the overall user interface of the application. With the aid of React, programmers can create complex web applications that update data without refreshing the page. React's primary objectives are to be quick, scalable, and easy to use. Only functions in the user interface of the application. This relates to the MVC template's view. It is compatible with various JavaScript libraries and MVC frameworks like Angular JS.

### C. NodeJS

Nodejs (Node) is an cross-platform, open-source runtime environment for JavaScript programming. Node is frequently employed for server-side programming, which frees developers from having to learn extra languages in order to make use of JavaScript in both client-side and server-side coding. It's incorrect to refer to Node as a programming language or an application development framework. This is solely a runtime for JavaScript.

The V8 JavaScript engines utilised by Google's Chrome along with other browsers is a component of Node. It is

written in C++ and works on macOS, Linux, Windows and other systems.

### D. ExpressJS

Expressjs is a lightweight framework that enhances the capability of the Node.js web server by streamlining existing APIs and introducing useful new capabilities. With middle-ware and routing, it is simpler to organise the functionality of your application. It makes Node.js HTTP objects more functional and makes it easier to display dynamic HTTP objects. Express.js, usually known as "Express," is a Node.js backend framework that is straightforward, quick, and similar to Sinatra. It offers powerful capabilities and tools for creating scalable backend applications. You may leverage its routing system and streamlined features to expand the framework by creating more robust components and pieces in accordance with the use cases for your applications.

### E. MongoDB

A cross-platform, document-focused database, MongoDB is source enabled. MongoDB, a NoSQL database programme, employs documents that resemble JSON and optional schemas.

A document, or field-value pair data structure, is what MongoDB refers to as a record. A JSON object is similar to a MongoDB document. Other files, arrays, and collections of documents can be included in field values. Many programming languages have native kinds of data that are related to documents (or objects), i.e., objects. The use of arrays and embedded documents eliminates the requirement for pricey joins. Dynamic schemes facilitate flow polymorphism.

### F. Solidity

Smart contracts are implemented using the high-level object-oriented language Solidity for the. The smart contracts is a piece of software that controls how accounts behave within the Ethereum System. Solidity is expressed with braces. Built using the Ethereum Virtual Machine, or EVM, in mind and developed using C++, Python, and JavaScript. In addition to inheritance, libraries, and other features, the Solidity language is statically encoded and allows sophisticated user-defined types.

### G. Metamask

As a browser plugin, MetaMask is a digital currency wallet that lets users store tokens, communicate with decentralised services, and exchange Ethereum. MetaMask removes the need for users to input their private key when producing, storing, or trading tokens by integrating with MyEtherWallet.

With a blockchain wallet, users may keep and handle Ethereum, Bitcoin, and other cryptocurrencies. These wallets are accessible online or as digital wallets. Blockchain wallets allow users to transfer cryptocurrencies, stop cryptocurrency theft, and convert their cryptocurrency holdings into local cash as needed. With over 30 million active users each month, MetaMask is now the most well-liked blockchain wallet and the most extensively used zero administration cryptocurrency wallet globally.



## RESULT AND DISCUSSION

This implemented system is a website where the user will have to login with this metamask id. Following his login, he will be shown a dashboard where he can view all the information, including his overall impact, the donations he has made, the amount of money he has provided, etc. The user will be able to keep tabs on all of his transactions. The continual monitoring of transactions will inform the user of the transaction's current processing status. Finally, if the recipient passes away or is faced with an uncontrollable circumstance, that individual will receive a reimbursement.

## CONCLUSION

Given India's current low straightforwardness of charity, data security, trust issues among people, and issues related to the bogus foundation are issue areas that require quick attention. This report offered a novel method for leveraging blockchain innovations to revolutionize this framework of this fundraising. The resolutions we proposed were put into action to create an end-to-end empowerment and platform for decentralized foundation. The blockchain keeps track of every transaction, allowing for financial tracing and greater transparency for charity. With this blockchain fundraising method, the lack of openness in philanthropy can theoretically be overcome, which could boost public confidence in organizations. The future of fundraising is a full-fledged blockchain-based infrastructure.

## REFERENCES

- [1] N. Salido-Andres, M. Rey-Garcia, L. I. Alvarez-Gonzalez and R. Vazquez-Casielles, "Nonprofit organizations at the crossroads of offline and online fundraising in the digital era: The influence of the volume of target beneficiaries on the success of donation-based crowdfunding through digital platforms," 2018 13th Iberian Conference on Information Systems and Technologies (CISTI), 2018, pp. 1-5, doi: 10.23919/CISTI.2018.8399343.
- [2] Deepti Saraswat, Farnazbanu Patel, Pronaya Bhattacharya, Ashwin Verma, Sudeep Tanwar, Ravi Sharma, UpHaaR: Blockchain-based charity donation scheme to handle financial irregularities, *Journal of Information Security and Applications*, Volume 68, 2022.
- [3] Yung-Ming Li, Jih-Dong Wu, Chin-Yu Hsieh, Jyh-Hwa Liou, A social fundraising mechanism for charity crowdfunding, *Decision Support Systems*, Volume 129, 2020, 113170, ISSN 0167-9236.
- [4] Vikas Hassija, Vinay Chamola, Sherali Zeadally, BitFund: A blockchain-based crowd funding platform for future smart and connected nation, *Sustainable Cities and Society*, Volume 60, 2020, 102145, ISSN 2210-6707.
- [5] P. R. Nair and D. R. Dorai, "Evaluation of Performance and Security of Proof of Work and Proof of Stake using Blockchain," 2021 Third International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV), 2021, pp. 279-283, doi: 10.1109/ICICV50876.2021.9388487.
- [6] Muhammad Shoaib Farooq, Misbah Khan, Adnan Abid, A framework to make charity collection transparent and auditable using blockchain technology, *Computers Electrical Engineering*, Volume 83, 2020, 106588, ISSN 0045-7906,
- [7] J. Zhang, S. Zhong, J. Wang and L. Wang, "An Systematic Study on Blockchain Transaction Databases Storage and Optimization," 2020 IEEE Intl Conf on Parallel Distributed Processing with Applications, Big Data & Cloud Computing, Sustainable Computing & Communications, Social Computing Networking (ISPA/BDCLOUD/SocialCom/SustainCom), 2020, pp. 298-304, doi: 10.1109/ISPA-BDCLOUD-SocialCom-SustainCom51426.2020.00063.
- [8] J. Y. Qiu and C. Liu, "An In-kind Charitable Donation System App Design Practice Driven By Social Innovation Design Concept," 2019 6th International Conference on Information Science and Control Engineering (ICISCE), 2019, pp. 141-145, doi: 10.1109/ICISCE48695.2019.00038.
- [9] L. Wan, D. Eysers and H. Zhang, "Evaluating the Impact of Network Latency on the Safety of Blockchain Transactions," 2019 IEEE International Conference on Blockchain (Blockchain), 2019, pp. 194-201, doi: 10.1109/Blockchain.2019.00033.
- [10] J. Jayabalan and J. N., "A Study on Distributed Consensus Protocols and Algorithms: The Backbone of Blockchain Networks," 2021 International Conference on Computer Communication and Informatics (ICCCI), 2021, pp. 1-10, doi: 10.1109/ICCCI50826.2021.9402318.
- [11] R. A. Canessane, N. Srinivasan, A. Beuria, A. Singh and B. M. Kumar, "Decentralised Applications Using Ethereum Blockchain," 2019 Fifth International Conference on Science Technology Engineering and Mathematics (ICONSTEM), 2019, pp. 75-79, doi: 10.1109/ICONSTEM.2019.8918887.
- [12] R. Mauliadi, M. R. A. Setyautami, I. Afriyanti and A. Azurat, "A platform for charities system generation with SPL approach," 2017 International Conference on Information Technology Systems and Innovation (ICITSI), 2017, pp. 108-113, doi: 10.1109/ICITSI.2017.8267927.
- [13] J. Jayabalan and J. N., "A Study on Distributed Consensus Protocols and Algorithms: The Backbone of Blockchain Networks," 2021 International Conference on Computer Communication and Informatics (ICCCI), 2021, pp. 1-10, doi: 10.1109/ICCCI50826.2021.9402318.
- [14] W. Zou et al., "Smart Contract Development: Challenges and Opportunities," in *IEEE Transactions on Software Engineering*, vol. 47, no. 10, pp. 2084-2106, 1 Oct. 2021, doi: 10.1109/TSE.2019.2942301.
- [15] P. Agarwal, S. Jalan and A. Mustafi, "Decentralized and financial approach to effective charity," 2018 International Conference on Soft-computing and Network Security (ICSNS), 2018, pp. 1-3, doi: 10.1109/ICSNS.2018.8573644.
- [16] N. S. Sirisha, T. Agarwal, R. Monde, R. Yadav and R. Hande, "Proposed Solution for Trackable Donations using Blockchain," 2019 International Conference on Nascent Technologies in Engineering (ICNTE), 2019, pp. 1-5, doi: 10.1109/ICNTE44896.2019.8946019.
- [17] P. Lanerolle, S. Rathnayaka, H. Rupasinghe, S. Madhushanka, U. Samarakoon and D. Kasthurirathne, "Donate.lk: A Smart Donation Handling System," 2018 National Information Technology Conference (NITC), 2018, pp. 1-6, doi: 10.1109/NITC.2018.8550078.
- [18] A. Endurthi and A. Khare, "Cheat Proof Escrow System for Blockchain," 2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS), 2021, pp. 294-298, doi: 10.1109/ICICCS51141.2021.9432291.
- [19] W. Lee, D. Kim and B. R. Jeon, "A Study on Blockchain Application in Donation Platform," 2021 21st ACIS International Winter Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD-Winter), 2021, pp. 284-286, doi: 10.1109/SNPDWinter52325.2021.00075.
- [20] A. Barger, O. Ilina, A. Zemtsov and K. Tagirova, "Trustful Charity Foundation platform based on Hyperledger Fabric," 2022 IEEE International Conference on Omni-layer Intelligent Systems (COINS), Barcelona, Spain, 2022, pp. 1-6, doi: 10.1109/COINS54846.2022.9854995.