

CHARITY PLATFORM USING BLOCKCHAIN

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Abstract –

The content of this abstract is a proposal for a charity platform that utilizes blockchain technology to increase transparency and accountability in charitable donations. The proposed platform would utilize a smart contract-based system to ensure that funds are distributed fairly and transparently, with clear records of all transactions available to the public. The platform would use a combination of Solidity, Web3, and Ganache to create a decentralized application (DApp) that can be accessed by anyone with an internet connection. Solidity would be used to create the smart contracts that govern the distribution of funds, while Web3 would be used to communicate with the Ethereum blockchain. Ganache would be used as a local blockchain development environment to test and deploy the contracts.

In the charity system, blockchain can be used to increase transparency, accountability, and trust between donors and recipients. Donors can track their donations and ensure that they are being used for their intended purpose. They can also see the impact of their donations in real-time, which can increase engagement and encourage more donations.[8]

Blockchain can also ensure that funds are distributed fairly and efficiently. Smart contracts can be used to automate the distribution of funds, ensuring that they are sent to the intended recipients and that they are used for their intended purpose. This can reduce the administrative burden on charities and ensure that funds are distributed quickly and efficiently.

1. INTRODUCTION

The concept of charity has been around for centuries, with people donating their time, resources, and money to help those in need. With the advent of technology, charity has become more accessible, with online platforms allowing people to donate money and resources at the click of a button. However, there are still challenges in the charity system, including issues with transparency, accountability, and distribution of funds. Blockchain technology offers a potential solution to these challenges and has the potential to revolutionize the charity system.[2]

Blockchain is a decentralized, immutable ledger that allows for secure and transparent transactions. It is a distributed database that maintains a continuously growing list of records, called blocks, that are linked and secured using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. This creates an unalterable record of all transactions, which can be accessed and verified by anyone on the network.[5]

Another benefit of blockchain in the charity system is the ability to track the provenance of donations. Donors can see where their donations are going and how they are being used, which can increase trust and encourage more donations. This can also help to prevent fraud and ensure that donations are not being misused.[12]

There are already several charities that are using blockchain technology to improve their operations. For example, the United Nations World Food Programme (WFP) is using blockchain to distribute food vouchers to refugees in Jordan. The vouchers can be redeemed at participating retailers, ensuring that food is distributed fairly and efficiently. The WFP is also using blockchain to track the provenance of donations, allowing donors to see where their donations are going and how they are being used. Another example is GiveCrypto, a charity that provides direct cash transfers to people in need using cryptocurrency. GiveCrypto uses blockchain to track the provenance of donations and ensure that funds are distributed fairly and efficiently. Recipients can receive their funds instantly, without the need for intermediaries or banks.[6]

1.1 CONTRIBUTION OF THIS WORK

The contribution of this work is the development of a Charity Platform that utilizes blockchain. The system provides a decentralized and immutable storage solution that ensures that transactions cannot be tampered with and their authenticity can be verified at any time.

This study is organized as follows: Section 2 provides background information by providing a brief review of previous literature and summarizing existing work on the topic. Section 3 describes the proposed approach for building document verification system with blockchain and the details of its implementation. Section 4 contains demonstration of the suggested approach. Section 5 summarizes the work and suggests the next research areas.

2. RELATED WORK

In "Blockchain Technology in Charitable Organizations: Opportunities and Challenges," the authors discuss how blockchain technology can help charitable organizations address challenges related to transparency, accountability, and cost-efficiency in donation management. The authors explain that traditional payment systems used by charitable organizations can be costly due to high transaction fees and slow processing times. By using blockchain technology, charitable organizations can reduce transaction costs and increase the speed of payment processing. Blockchain technology can enhance transparency and accountability in donation management by providing a tamper-proof and decentralized system for tracking donations. This can help to increase trust in charitable organizations and reduce the risk of fraud or mismanagement of funds. Donors can track the use of their donations and ensure that they are being used for the intended purposes.[1]

In "Towards a Blockchain-Based Charitable Platform," the authors explore the potential of blockchain technology to develop a decentralized and transparent system for charitable donations that enables efficient and secure record-keeping and transaction processing. The authors point out that the traditional charity sector is plagued with issues such as inefficient donation processing, high transaction fees, and a lack of transparency, which often lead to a lack of trust in charitable organizations.[2]

In "Decentralized Charitable Giving: A Case for a Blockchain-Based Platform," the authors argue that the traditional charitable donation system is plagued

with inefficiencies, high transaction costs, and a lack of transparency, which often result in a lack of trust in charitable organizations. The authors propose a blockchain-based platform that can address these issues by providing a decentralized and transparent system for charitable donations.[3]

In "Charitycoin: A Blockchain-Based Platform for Charitable Giving," the authors present a platform that aims to address the lack of transparency and accountability in the charity sector by leveraging the benefits of blockchain technology. The platform, called Charitycoin, is built on a decentralized ledger that enables real-time tracking of donations and ensures that funds are being used effectively. The authors argue that the current charity system suffers from a lack of transparency, where donors are often unable to track the use of their donations and ensure that they are being used for their intended purposes.[4]

In "Blockchain-based charity crowdfunding platform for sustainable development goals," the authors present a platform that aims to address the challenges in traditional charity crowdfunding by leveraging the benefits of blockchain technology. The platform is built on a decentralized ledger that enables transparent and secure record-keeping and transaction processing.[5]

In "A blockchain-based model for charitable donations," the authors present a model that aims to leverage the benefits of blockchain technology to create a more efficient and transparent system for charitable donations. The model is based on a decentralized ledger that can enable secure and transparent record-keeping and transaction processing. The authors argue that the current system for charitable donations suffers from a lack of transparency and accountability, where donors are often unable to track the use of their donations and ensure that they are being used for their intended purposes.[6]

The proposed model solves this problem by using smart contracts to automate the donation process and track the use of funds on a tamper-proof ledger. Donors can track the progress of the charitable project in real-time, see how their funds are being used, and ensure that the project is aligned with the charitable objectives. The authors also discuss the potential of the model to increase the efficiency of the charitable donation process by reducing transaction costs and

increasing the speed of donation processing. By eliminating intermediaries and automating the donation process, the model can reduce transaction fees and increase the efficiency of donation processing.[7]

In recent years, blockchain technology has emerged as a potential solution to some of the challenges faced by the charity sector, particularly around transparency and accountability. In the paper "Blockchain Technology for Charitable Organizations," the authors explore how blockchain technology can enable charitable organizations to increase transparency, reduce fraud, and improve donation management.

One key benefit of blockchain technology is its ability to provide a transparent and immutable record of transactions. By using blockchain technology, charitable organizations can create a public ledger that shows how donations are being used, increasing transparency and accountability. This also helps to build trust between donors and charitable organizations, as donors can see exactly where their donations are going.[8]

Blockchain technology can also help to reduce fraud in the charity sector. By creating a secure and decentralized system for donation management, blockchain technology can ensure that donations are being used for their intended purpose and that funds are not being diverted for other purposes. This can help to build trust between donors and charitable organizations, which is crucial for the long-term sustainability of the sector. In addition, blockchain technology can enable more efficient donation management. By using smart contracts, charitable organizations can automate many of the processes involved in donation management, such as tracking donations and distributing funds. This can reduce administrative costs and enable charitable organizations to focus more resources on their core mission.[9]

Overall, the paper "Blockchain Technology for Charitable Organizations" highlights the potential of blockchain technology to transform the charity sector by increasing transparency, reducing fraud, and improving donation management. As the technology continues to evolve, it is likely that we will see more charitable organizations adopting blockchain-based solutions to address the challenges they face.

3. PROPOSED APPROACH AND IMPLEMENTATION DETAILS

The proposed system is a blockchain-based charity platform that aims to increase transparency, accountability, and trust in the charity sector. It provides a decentralized platform for charitable donations, where donors can track their donations in real-time and ensure that funds are being used effectively.

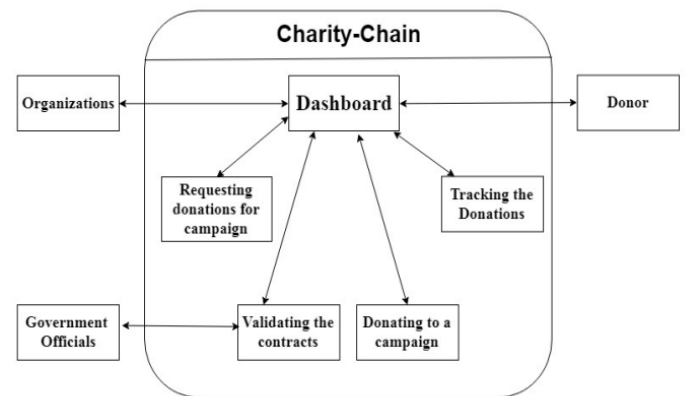


Fig.3.1 Block Diagram of Proposed System

Here are some features of a charity platform using blockchain :

1. **Smart Contract:** The wallet should use a smart contract to ensure that the funds are locked securely and released only when the predetermined conditions are met.
2. **Decentralization:** The wallet should be decentralized, meaning that it should be based on a blockchain network such as Ethereum, Bitcoin, or another blockchain platform.
3. **Security:** The wallet should be designed with security in mind, and it should include features such as two-factor authentication, multi-signature, and encryption.
4. **User Interface:** The wallet should have a user-friendly interface that allows users to easily lock and unlock their funds and monitor their assets.

5. Transparency: The blockchain-powered time-lock wallet should be transparent, with all transactions and activities recorded on the blockchain network.

6. Compatibility: The wallet should be compatible with various devices, including desktop computers, smartphones, and tablets.

7. Interoperability: The wallet should be interoperable with other wallets and blockchain-based applications, allowing users to transfer their locked assets to other wallets or use them in other applications.

3.1 USER INTERFACE

The system uses Solidity, Web3, Metamask, Node.js, and Ganache to create a secure and user-friendly platform. Solidity provides inheritance properties in contracts, including multiple level inheritance properties, which can be used to develop smart contracts for the platform. Web3 is used to connect the platform to the Ethereum blockchain, while Metamask provides an easy-to-use and secure wallet service for users.

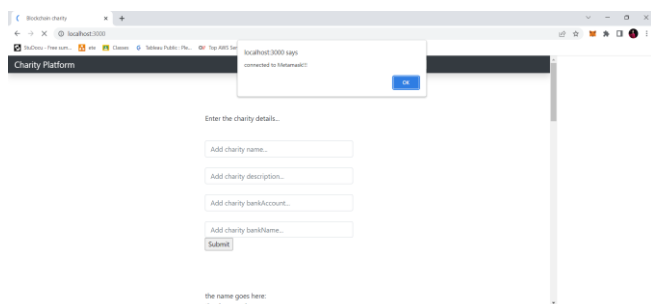


Fig. 3.1.1 User Interface

3.2. SMART CONTRACT

Smart Contracts are the fundamental blocks of a decentralized application. A smart contract is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the performance of credible transactions without third parties.

The smart contract will also be designed to be transparent and auditable. Anyone can view the smart contract code and verify that it is working as intended. This provides users with confidence that their funds are safe and secure.

3.3 Truffle IDE

The Truffle is a development environment, testing framework and asset pipeline for blockchain using the Ethereum Virtual Machine (EVM). It provides built-in smart contract compilation, linking, deployment and binary management. One of its most important features is it has automated contract testing for rapid development.

The Truffle is widely considered the most popular tool for blockchain application development with over 1.5 million lifetime downloads. Truffle supports developers across the full lifecycle of their projects, whether they are looking to build on Ethereum, Hyperledger, Quorum, or one of an ever-growing list of other supported platforms. Paired with Ganache, a personal blockchain, and Drizzle, a front-end dApp development kit, the full Truffle suite of tools promises to be an end-to-end DApp development platform.

- Built-in smart contract compilation, linking, deployment and binary management.
- Automated contract testing for rapid development.
- Scriptable, extensible deployment & migrations framework.
- Network management for deploying to any number of public & private networks.
- Package management with EthPM & NPM, using the ERC190 standard.
- Interactive console for direct contract communication.
- Configurable build pipeline with support for tight integration.
- External script runner that executes scripts within a Truffle environment.

3.4 MetaMask :

Metamask wallet can be used for storing keys for Ether and ERC20 tokens on three different web browsers. It also allows users to browse the Ethereum blockchain from a standard browser.

4. IMPLEMENTATION & RESULTS

The proposed approach has been implemented and the application is explained in this section:

A] SETUP

Smart Contracts: The system uses Solidity programming language to implement smart contracts that govern the transactions between the charity and the organization. These smart contracts include functions to create new charities and organizations, record transactions between them, and generate transaction hashes.

Web3: Web3 is used to interact with the Ethereum blockchain network. It allows the system to communicate with the smart contracts and send transactions to the blockchain.

Metamask: Metamask is used as a wallet service to store the user's private keys and sign transactions. The system connects to Metamask automatically to provide an easy-to-use and secure wallet service.

Node.js: Node.js is used as the backend for the application. It records transactions and communicates between the applications and integrates frontend. It also serves as a bridge between the frontend and the Ethereum blockchain network.

Ganache: Ganache provides a GUI-based local Ethereum blockchain development environment to deploy and test smart contracts. It is used to test the smart contracts before deploying them to the main Ethereum network.

B] CONTRACT CREATION

In the proposed blockchain-based charity platform, a smart contract is created to manage the transactions between donors and charities. The contract is created using Solidity, a programming language specifically designed for writing smart contracts on the Ethereum blockchain. The smart contract is deployed on the blockchain using a development environment like Remix IDE or Truffle. The contract is then tested and verified using tools like Ganache or Rinkeby test network before being deployed on the main Ethereum network. The contract includes functions for managing the donations, such as accepting donations from donors and transferring funds to the charities.

The contract also includes functions for storing and retrieving information about the charities and their activities.

C] DEPLOYMENT

To ensure security and transparency, the contract is programmed with certain conditions that must be met before a transaction can be executed. For example, the contract may require that a certain percentage of the donated funds be used for the stated charitable purpose, and that any unused funds be returned to the donor. Once the contract is deployed on the blockchain, it becomes immutable and cannot be altered, providing a high level of security and transparency for the charity platform. contract is created to manage the transactions between donors and charities. The contract is created using Solidity, a programming language specifically designed for writing smart contracts on the Ethereum blockchain. The smart contract is deployed on the blockchain using a development environment like Remix IDE or Truffle. The contract is then tested and verified using tools like Ganache or Rinkeby test network before being deployed on the main Ethereum network. The contract includes functions for managing the donations, such as accepting donations from donors and transferring funds to the charities. The contract also includes functions for storing and retrieving information about the charities and their activities.

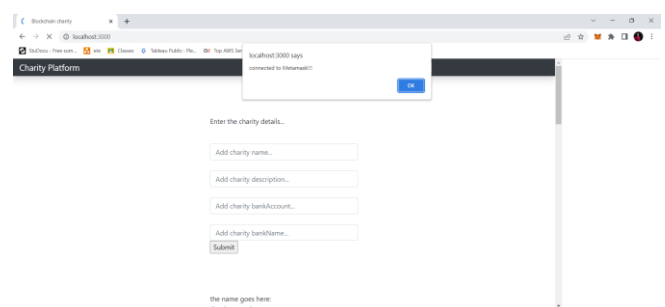


Fig. 4.1 Home Page

Fig. 4.2 Charity Donor Details

Fig. 4.3 Charity Receiver Details

5. CONCLUSION AND FUTURE WORK

In conclusion, blockchain technology has the potential to transform the charity sector by increasing transparency, accountability, and efficiency in donation management. By providing a decentralized and immutable ledger for recording transactions, blockchain can enable donors to track their donations in real-time and ensure that funds are being used effectively by charities. Moreover, the use of smart contracts can automate the process of donation management, reducing the need for intermediaries and lowering transaction costs. However, the implementation of blockchain-based charity platforms still faces some challenges, such as regulatory compliance, scalability, and user adoption. Regulatory compliance is critical for charities to ensure that they are following legal and ethical standards while using blockchain technology. Scalability is another challenge, as blockchain platforms may struggle to handle a large volume of transactions, especially during peak times. Lastly, user adoption is essential to the success of blockchain-based charity platforms, and

charities need to ensure that their donors are comfortable using this new technology.

Despite these challenges, the potential benefits of blockchain technology in the charity sector are significant, and further research and development are necessary to overcome these challenges and unlock the full potential of this technology. Overall, the use of blockchain technology in the charity sector is a promising development that can help create a more transparent, efficient, and accountable system for charitable giving.

There are several potential future directions for a charity system that uses blockchain technology –

- **Implementing smart contracts:** One potential use case for blockchain in the charity space is the use of smart contracts. These are self-executing contracts that can be programmed to trigger certain actions when certain conditions are met. For example, a smart contract could be set up to release funds to a charity once a certain fundraising goal is reached. This would provide greater transparency and accountability, as donors could see exactly where their money is going and how it is being used.
- **Tokenizing donations:** Another potential use case for blockchain in the charity space is the use of tokens to represent donations. This would allow donors to track the progress of their donation in real time and see how it is being used. It could also make it easier to incentivize donations, as donors could receive tokens that could be traded or used to access certain benefits.
- **Using blockchain for supply chain tracking:** Another potential use case for blockchain in the charity sector is the use of blockchain for supply chain tracking. This would allow charities to track the movement of goods and resources from donors to beneficiaries, ensuring that they are delivered to the intended recipients and used for their intended purposes.

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