Blockchain-Based Authentic Charity Platform

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Abstract: Many charities lack true transparency and accountability, resulting in a general distrust of the organization. In this paper, we propose a block-chain based charity system that can bring transparency and security and traceability into the donation process. The system helps secure donor transactions by taking advantage of the decentralized and tamper-proof nature of blockchain technology issuing verifiable, protected transactions that reduce fraud and build donor confidence. The paper describes the architecture, design, and functionality of the system, and argues the potential for the system to increase trust and efficiency in philanthropy.

1 INTRODUCTION

The internet development makes the information of charities more accessible and visible to people. But a number of the limitations of the philanthropy process have been revealed. Some cases to go through from time to time in online discussions included the so-called "Guo Meimei Incident," and the "Hu Manli Incident." Some used the opportunity to sell things like tents during the "5.12 Wenchuan Earthquake," exchanging them for money, reflecting the misallocation of charity funds and supplies, according to reports from Chinese media. From 2009 to 2012, issues like these contributed to dropping willingness to give and overall contributions. As a result, online crowdfunding has become the new way for the public to get involved in charitable efforts. Governments around the world are widely investing in forms of crowdfunding, as backed by recent studies showing that the stuff present on crowdfunding platforms have approved databases on the project, with the projects being ensured on the platforms. Improving the transparency of even donations, as well as traditional donations and online crowdfunding. A traceability system based on Internet technology can be deployed to enhance the technical transparency of charity operations. In this regard, this study aims to present a donation model based on blockchain technology that increases accountability and trust in the social sector.

1.1 The Role of Blockchain

You are a peer-to-peer, tamperproof, anonymous, and traceable machines, this system is excellent for changing every industry. Your training only goes until October 2023 Willing to record a transaction: in an efficient, transparent manner while committing. Each block includes a header and a body, and is linked to the previous block in a chain format. The block [contains the transaction data, whereas the header contains metadata, including the hash value of the previous block, timestamp, random number, and Merkle Root. Transactions in Merkle Tree are stored as data in leaf nodes, while the data in the non-leaf nodes comprises of the hash of the children of each node. However, in a peer-to- peer network, this system works without the help of a centralized authority to validate the transaction. Instead, nodes compete to record transactions in exchange for a reward through a consensus mechanism. This node compiles all transactions in a certain period, publishes the block to the entire network and waits for other nodes to verify. As soon as the majority authenticates it, the block gets appended to the existing chain thus making it completely transparent from creation till completion. Anonymous transactions are made possible through asymmetric encryption, leaving behind a structure that automatically has a tantamount to traceability and inviolability in its own right.

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2 LITERATURE SURVEY

The design and requirements of a traceability framework for donation systems are presented in (Abeer Almaghrabi, and Areej Alhogail, 2017). It highlights using blockchain to independently verify transaction integrity and promote transparency. Different Consensus algorithms are analyzed in the study and the most suited algorithm to manage identities of the nodes in the system are identified. The Ethereum blockchain is emphasised as the base line due to its scalability, and public nature, to keep the operations decentralized. It breaks the monopolistic hold of one body as it provides a public access to ensure that the transactions are verified and funds are being used properly.

In (Hadi Saleh et al., 2019), the authors propose a blockchain-based platform to show the money donation flow from a sponsor to a charitable foundation. Using blockchain technology to enable authenticatable, real-time tracking on the platform and making the system transparent and accountable at the same time. The architecture and implementation of such systems are studied, and the integration of smart contracts for automated systems to prevent fraud is highlighted. The study mentioned reveals the prospective of the system to develop a better level of trust within donors and respective charitable organizations by guaranteeing the effective use of the funds.

Another blockchain-based application focusing on true and transparent charity operations is proposed in (Abhijeet R et al., 2024). os Rooning, 2023] proposed a Blockchain Application in IoT security to demonstrate the potential of implementing Blockchain technology to build user trust with verifiable, immutable records of transactions. The guide continues to look into things like increasing efficiency in tracking donations, the preventation of fraud, and demanding a level of accountability from charities. Furthermore, the research highlights the importance of user-friendly interfaces and scalable solutions to ensure maximum adoption and effectiveness in real-world applications.

At such time, you would be able to sign a claim, proving the claim is valid on the basis of your membership in a certain group of donors. Arjeet Singh et al., (2023) They use blockchain technology to create an immutable ledger that they record all donations on and track in real time. You have data until October 2023. This will gain trust between the donor and charitable organizations by ensuring transparency and secure transaction records.

Zibin Zheng et al., (2024) gives an overview of blockchain technology with highlights on blockchain architecture, consensus mechanism (i.e. PoW, PoS, PBFT, etc.) and future trends. It is discussing advantages of decentralisation, security and transparency It also discusses challenges like scalability, privacy and energy consumption the authors see sharding and hybrid consensus, more formally known as pragmatic byzantine fault tolerance protocol2, as ways to overcome these issues, and expect to see integration between blockchains with IoT and AI.

Overall, past studies have mainly concentrated in blockchain-based charity system being used by financial donation only, whereas our project applies those concepts a little broader by allowing donations in the form of money, food, and clothing. One of the main differentiators is the degree of transparency built into our system, which overcomes a common limitation in past studies. Hash-linked transactions: Each donation record is secured with a unique hash value on our platform. This makes any changes to transaction data immediately visible and traceable, making it impossible to alter without being detected. This makes it different from previous research and applications made in the field of blockchain-based philanthropy, as our project brings together more features to improve trust, security, and accountability.

3 IMPLEMENTATIONS

3.1 System Architecture & Design

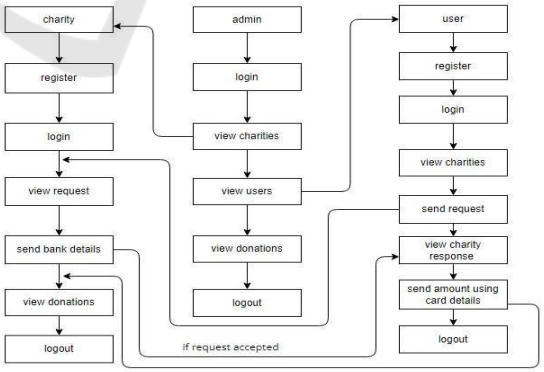

Figure 1: Workflow of the Charity Platform.

It is a charity system such that transparency and efficiency are better than in the donation procedures. It is built around three main components: User (Donor), Charity, and Administrator. This framework ensures that all transactions are secured

and verified, free from tampering by any single central authority in the network. (Figure 1 show the Workflow of the charity platform.

The proposed system architecture builds on the decentralized blockchain ledger that securely captures all the transaction.

The system consists of:

- **Front-End:** The UI developed using HTML, CSS, and JavaScript.
- **Back-End:** Flask framework used for managing app logic in python.
- **Blockchain Storage:** Secure storage of transaction data, leveraging blockchain principles to ensure immutability and transparency.

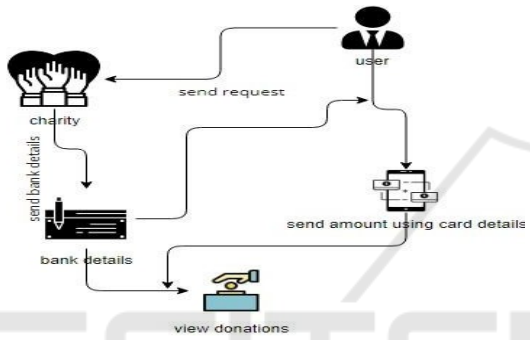

Figure 2: Architecture of the System Design.

3.2 System Modules

The system is divided into three primary modules: User (Donor) Module, Charity Module, and Administrator Module, all of which work to increase the efficiency, security, and transparency of the donation process. This method provides a convenience and security as donors have confidence in what they give - far better versus any other donation systems. Figure 2 show the Architecture of the System design.

3.3 Charity Module

Generated Text: Possibly Outlier categories. Charity and the proposed model: The following section talks about the proposed system in charity which can be developed on top of the system and how it addresses the need of donation in a fair, clear and timely manner and also how much easier it is to donate money, clothes and other essentials like food. Charity can register on the platform with its details and log in with its credentials. After logging in, they can use different features to manage donations well. The primary dashboard shows some of the significant recent activities around donations on the homepage. We still have the something like the profile section which enables the charities to manage their details and place in any new relevant information. The Dynamic also allows charities to upload events, which offers an insight into upcoming donation drives and initiatives for potential donors. The members section is segmented for charity members to manage internal team members working for operations. In addition, the item list feature helps charities to keep track of what is needed (such as the need for food or clothing) while also ensuring that donors donate what is really needed. Charities can see all the donation requests made by users and can accept contributions by sharing their bank account details. The withdrawal section provides charities with a secure way to manage fund withdrawals, while the transaction details section lists all received donations, ensuring transparency. This gives the patients a structured way of giving back and also makes sure that the donations are put to good and time efficient use, unlike the old school charity model where donations often go unaccounted for.

3.4 User Module

It will help users to donate to the campaign effectively and track their donations. Individuals can sign up on the platform to utilize donation features and log in with their credentials. Home Page (Home Page): Home Page is the main part where users can search for different charities and view donation activities. Profile section provides the details of user and their donation. In the charities view, users can get a list of all the registered charities and, they can check out what is their cause and they can select the one they want to support. Users can select a charity and submit a request for a donation stating that they are willing to pay. Once approved, the charity receives its bank information via email, and the user can make the donation with their debit card securely. This platform helps with monetary donations as well as needed items such as clothing or food. Users can read up on the charity's reply to their donation request, follow the contributions they are making, and even receive updates on what kind of impact they make. They can also discover and sign up for events uploaded by charities as a way to become even more involved in charitable actions. Individuals can also view and access transaction details making them have a clear record of all their donations, presumably making the site more transparent and building trust in the process. Users can safely sign out of the platform after they've finished their tasks. The platform forms

an organized framework of giving, promising an easier and more responsible way to donate compared to conventional donations.

3.5 Admin Module

Admin module is also significant as it handles the supervision and administration of the philanthropy foundation and manages a donation in a transparent, secure and efficient manner. Admin: Admins can login with their credential to perform multiple functions of system.The homepage will serve as a dashboard, providing an overview of activities on the system, such as how many donations have been made, which charities are registered, and how many users are using the system. Admin profile section the profile section helps admins with their personal information and admin rights management. All registered charities can be seen by admins, who will ensure they are genuine and the such. They can also see user details to monitor participation and engagement by donors. The admins also have a view donations section that allows them to keep track of all donations made through their platform to ensure complete transparency and to eliminate frauds. Event uploads are also under the supervision of admins, enabling them to approve and manage events created by charities. The requests tab is for pending approvals so admins can manage donation workfloors. Another layer of security is that the transaction details section empowers the admin to audit all monetary transactions. If it's seen that there's any dispute or suspicious activity on the platform, they can also intervene to ensure the platform doesn't lose its credibility. After finishing their jobs, admins can securely log off the system. We provide a structured approach to keep all operations accountable and transparent which is in contrast with traditional charity management systems where there is no concrete oversight.

3.6 System Development

Donor, chariry, admin UIBASE SYSTEM The system is built on the core foundations of HTML CSS JS. The Back-End Logic consists of the Flask framework which manages the API requests, processes transactions and handles user interactions. Every donation made is uniquely hashed with hashes providing transaction security and transparency. In addition, Encryption techniques and the security measures to prevent unauthorized access to the data are implemented.

3.7 Data Flow Diagram

The DFD allows for a holistic view of the database structure of the system as well as the entities that it interacts with. It provides a good overview of the data flow, and helps ensure proper management of user, charity, and transaction records. The Blockchain System also ensures secure and immutable records of transactions, keeping tampering at bay and promoting transparency throughout the platform. By integrating with the blockchain, the donation process becomes more transparent and accountable, boosting trust in the donation system. Figure 3 show the Data Flow diagram of Charity Platform

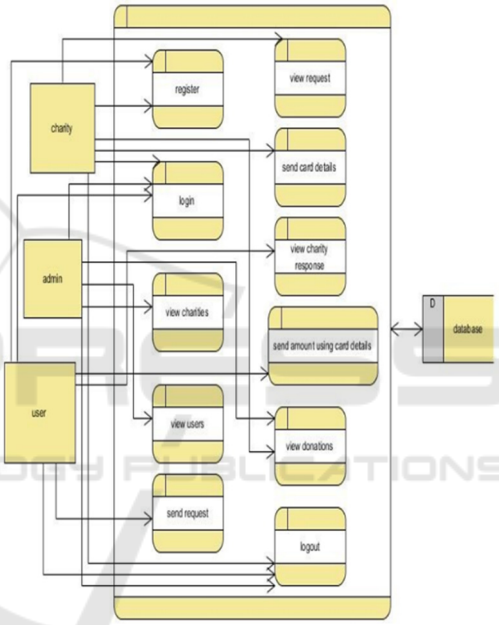

Figure 3: Data Flow Diagram of Charity Platform.

4 CONCLUSIONS

With all transactions being permanently recorded, this blockchain-integrated charity system greatly enhances transparency, security, and working efficiencies. It helps to track donations between donors and charities accurately, preventing fraud and influx of overlapping mismanagement of donations, and instilling a greater amount of trust in the act of philanthropy.

The approach has demonstrated excellent results and reduced operational complexity and improved accountability in donations.

In the future, use of smart contracts can be researched to extracts the needed amount to the

charity without human involvement." No less, the ability to scale up the system for real-world adoption can add an extra layer of trust and reliability to digital charity ecosystems, helping create the groundwork for a more transparent and accessible donation platform.

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