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CharityChain – A Blockchain Based Charity Application

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Abstract - Benefactors don't have trust about how donated money is being used. Charities are vulnerable to the same types of fraud that afflict businesses, such as embezzlement and executive misuse of money. Recently, blockchain technology have been implemented in different sectors. The use of blockchain technology allows you to make the process of giving and receiving money more transparent. It is necessary to build a single platform for tracking donations that will track all information regarding gifts, transactions, and donors. The purpose of this article is to describe the creation of a blockchain-based infrastructure for tracking donations. The purpose of this article is to describe the creation of a blockchain-based infrastructure for tracking donations. Based on blockchain technology, the system provides transparent accounting of operations for donors, charitable foundations, and recipients. A transparent contribution channel should be available on a philanthropic platform, allowing public users and contributors to follow and monitor where, when, and to whom charity donations were disbursed.

***Key Words*: Smart contract, etherium, blockchain, transactions, Ledger.**

1.INTRODUCTION

The Central Bureau of Investigation announced this year that India has two million non-profit organisations, with one for every 600 individuals. Many in the non-profit sector, however, feel the amount is substantially higher. Charity fraud occurs when charitable organisations that request cash from the public for altruistic causes, such as finding cures for diseases or assisting the families of dead police officers, solicit donations in a dishonest manner or utilise the funds for purposes not intended by the contributors. Charities are vulnerable to the same types of fraud that afflict businesses, such as embezzlement and executive misuse of money. This paper outlines best practises for social purpose architecture, platform design, and REST API implementation in blockchain initiatives. Improving the openness of charitable data is a key strategy to boost conventional contribution and online crowdfunding reputation. A traceability system may be developed using Internet technology to boost the technical transparency of charity. This study proposes a new model of donation based on blockchain technology for this aim.

2. MOTIVATION

Traditionally, the database is managed by a single entity or central authority, which has total control over the database. It has the capacity to modify data and interfere with databases. The authority that maintains the database is usually the same as the one that produced it and will be utilising it. In these circumstances, the organisation has no intention of misrepresenting or altering its own statistics. However, in other circumstances involving financial concerns or sensitive data such as voting, it's not a good idea to allow a single authority or group exclusive management of the database.Number equations consecutively. Equation numbers, Even though the business guarantees that no fraudulent modifications to the database will be made, hackers will find it easier to exploit a centralized database. To circumvent this, blockchain makes the database public, allowing anybody to store an individual copy of the database that can be compared at any time to check for modifications. Particular copies, on the other hand, must be updated on a regular basis to ensure consistency. Blockchain uses a consensus process to keep a decentralised dataset accurate.

A. Public Ledger :

- A public ledger is a type of ledger that is spread across several computers. Blockchain
- A ledger is an organised and stored data collection, particularly electronic data, for the goals of accounting, retrieving, processing, and controlling .A distributed ledger is a data structure that may be used to bring an uncommitted collection of copies to a final consistent state (eventual consistency) via a consensus mechanism.

B. Tokens and cryptocurrencies

- Cryptocurrency is a sort of digital money that uses cryptographic technologies to issue and govern its units.
- The most well-known implementation of blockchain technology is Ethereum.
- Tokens (or crypto tokens) are a type of asset or utility established using cryptocurrency.

C. Contracts that are intelligent

- Smart contracts were the next level of technological advancement (Ethereum, Hyperledger fabric).
- Smart contracts allow business logic to be implemented in a blockchain that can be monitored.

- A smart contract is a computer programme that can do computations, store data, and pay money to other accounts automatically.

3. RELATED WORK

The advantages of cryptocurrencies are an additional and distinct feature closely tied to the usage of Blockchain for humanitarian objectives. Hundreds of millions of dollars have been contributed in cryptocurrencies in recent years, with significant gifts including over $100 million to Fidelity Charitable, $29 million to Donors Choose, $4 million to The Ellen DeGeneres Wildlife Fund, and many more (Youssef 2020).

According to the 2019 "Global NGO Technology Report" by Nonprofit Tech for Good, bitcoin donations account for 1%–5% of all payment methods utilised in the charity sector, with over 100% increase in some countries (Nonprofit Tech for Good 2019). Crypto currency transactions are, in reality, instantaneous and cross-border (Huberman et al. 2019). They are recognised even in nations with a less established banking system, and they eliminate the need for middlemen. Furthermore, because of factors such as the size of the transaction, the number of other transactions carried out simultaneously, and the transactions have no limitations of any kind and have a much lower cost than other traditional systems, the transactions have no limitations of any kind and have a much lower cost than other traditional systems.

Cryptocurrencies may be tracked (Easley et al. 2019; Yang et al. 2019). Donors may examine the various transactions and so determine where their contributions have gone and whether they have been used for the intended purpose. Donors will be able to better allocate their future gifts as a result of this.

As we will see, the documentary and notarial function of Blockchain, which allows for greater efficiency in the exchange of documentation, an empowerment of entities, an increase in the security of documents that cannot be tampered with or deleted, and a reduction in printed paper, also increases the accountability and cost reduction of charitable organisations.

As a result, in order to promote the use of Blockchain in the nonprofit sector, as well as encourage the development of philanthropic initiatives 4.0, it is required to explain the technology's potential effect. Traceability is a motivator for non-profit organisations to improve their operations, cut expenses, and get the most money to the people who need it.

4. PROBLEM STATEMENT

The development of a social network based on blockchain technology that can assist non-profit organisations is essential. All users of the platform will be able to view their account and an explanation of each donation made by the organisation they support thanks to blockchain. Furthermore, distributed ledger technology will ensure that a donor's money reaches the intended recipient without the need for any intermediaries. Charity information will be provided.

5. PLATFORM FUNCTIONALITY

The platform's functioning is depicted for two sorts of actors (donor and charitable foundation) (see Figure 1).

Donor functionality includes:

- Obtaining information about a donation via the website. A unique identifier can be used to get information about a donor's gift. Information on the flow of funding for various firms will be sent to a donor.

The functionality for a charity foundation is as follows:

- Update contribution information. Donation information must be able to be recorded by foundations (manually or via REST request).
- The export of reports. A charity will be able to export a report to the Ministry of Justice based on donor information.

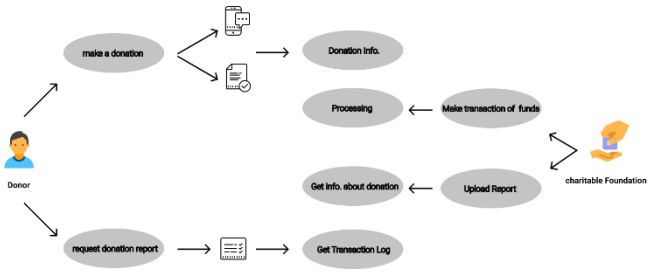


Fig.1. Platform Functionality

6. PROPOSED WORK

The planned charity system mode is depicted in the diagram below. Donors, recipients, charitable organisations, and cooperative stores are the four responsibilities. Through the website, charitable groups may receive information on how to seek aid and start charity initiatives. Donors use the site to learn about charity initiatives and then give to the recipients or charity organisations. Beneficiaries can acquire and spend tokens at cooperative stores after uploading their details to the website for assistance. The charity platform will be updated with the transactions that took place in the stores. To collect tokens, the cooperative stores provide services or items to the beneficiaries. Charity groups can trade the tokens for actual money. The whole flow of cash has been recorded on the blockchain, allowing transactions to be monitored and funds to be protected against misuse.

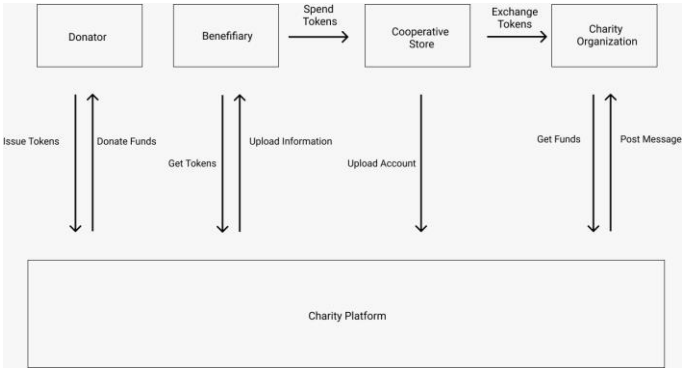


Fig.2. Interactions in a proposed model

A .Process for Using the Platform

1. Donor : After logging in successfully, the donor browses the charity projects and chooses one to give to. The balance of the donor account will be checked by the system. The user will be notified to deposit if the balance is inadequate. Only if the balance is adequate can the donation be finalised.

2. Persons in need : People who require assistance should complete the rescue information, which will be sent to the charity organisation for assessment, with approved projects being placed on the charity platform. The recipient may check the account balance to learn about the project's progress, and then use the tokens to purchase services or items in cooperative stores.

3. Shops that work together To gain tokens, the stores supply the beneficiaries with the appropriate services or items, such as prescriptions or books. Charity groups can swap tokens for actual money.

4. Charity Organisation : The group can receive donations from the platform to aid others and use the funds to exchange tokens at cooperative stores.

B. Dapp Model

The following features has to be achieved:

1. In the DApp, Beneficiary starts a charitable initiative.

2. Beneficiary asks for money from a charity effort that he started.

3. The donor makes a donation to the charitable initiatives of his choice.

4. A donor can vote on a funding request for a charity initiative in which they have previously engaged.

5. The monies are automatically sent to the beneficiary's account when the request for funds is authorised.

C .Tools used in Proposed system

1.Solidity:

Solidity is a high-level programming language for constructing smart contracts that is contract-oriented. Solidity is heavily influenced by C++, Python, and JavaScript, and it was built with the Ethereum Virtual Machine in mind (EVM).

2. What is web3 js is used for?

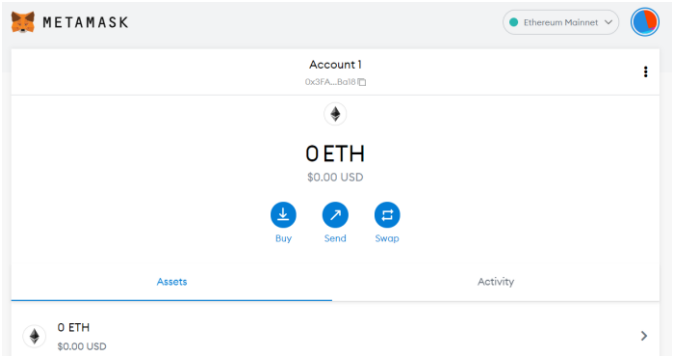
web3. js is a set of libraries that let you use HTTP, IPC, or WebSocket to communicate with a local or distant ethereum node.

3. Ganache:

Ganache is a personal blockchain that enables the building of Ethereum and Corda distributed applications quickly. Ganache may be used throughout the development cycle, allowing you to build, deploy, and test your dApps in a secure and predictable environment. Ganache is available in two flavours: user interface and command line interface.

4. Metamask:

Through a suitable web browser or the mobile app's built-in browser, MetaMask lets users to save and manage account keys, broadcast transactions, transfer and receive Ethereum-based coins and tokens, and securely connect to decentralised apps.



7. FUTURE WORK

The approach, as well as the nodes, were thoroughly detailed. Despite the fact that our endeavour is not entirely in line with the general charitable cause.

It's ideal for small-scale charitable efforts in businesses and communities.

Our objective is to broaden the use of blockchain technology beyond cryptocurrencies. It has the ability to cause havoc on a variety of current systems.

It has the ability to destabilise a variety of current systems and technologies. We're aiming to improve and implement our product so that it can reach a larger audience.

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