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A Platform for Tracking Charity Donation Using Blockchain

Deepika Nadar
Assistant Professor
St. John College of Engineering and Management Palghar, India
deepikan@sjcem.edu.in

Dheeraj Pandey
Computer Engineering
St. John College of Engineering and Management Palghar, India
dheerajp@sjcem.edu.in

Prinsu Tiwari
Computer Engineering
St. John College of Engineering and Management Palghar, India
219prinsu2021@sjcem.edu.in

Sushil Yadav
Computer Engineering
St. John College of Engineering and Management Palghar, India
sushily@sjcem.edu.in

Suraj Sahani
Computer Engineering
St. John College of Engineering and Management Palghar, India
surajsa@sjcem.edu.in

***Abstract*— Charity organizations are susceptible to the same kinds of fraud that harm businesses because donors lack confidence in how their money is being used. the requirement to provide a unified platform for monitoring donations that will monitor all data related to donations transactions and donors Lack of trust on the part of donors in how donations are used is a result of skepticism over how donations are used. Building a single platform for tracking donations that would manage all information regarding gift transactions is essential since charities are vulnerable to fraud that affects corporations, such as executive misuse of funds and embezzlement.**

***Keywords*—Transparent system, Smart contract, Blockchain, Charity, Ethereum, Digital charity.**

I. INTRODUCTION

When charities ask the public for money for charitable causes, charity fraud takes place. Charities, like businesses, are susceptible to the same kinds of fraud, like executive misuse of funds. A crucial tactic for increasing traditional donations and the reputation of online crowdfunding is to make charitable data more transparent. A traceability system might be developed using Internet technologies to improve the technical transparency of charity. In-person transfers of money to those in need replace formal organization, permanence, and accountability in fundraising. In other instances, the same people have appeared as beneficiaries in the records of many NGOs even though only one of those organisations is actually able to help a given beneficiary. Due to recipients from the same NGOs receiving benefits at the same time, there will be some actual beneficiaries who are fewer than the claimed beneficiaries. Once changed, the database is shared with all parties and can only be updated in accordance with pre- established rules. Every transaction in the blockchain is linked together in a line to guarantee that everyone has access to the most recent version of the ledger. A blockchain network may duplicate and store transactional data using a distributed ledger. A blockchain-based solution is used to prevent beneficiaries from receiving the same benefit more than once from the same NGO or another NGO. Given that the same beneficiaries receive benefits from the same/different NGOs at the same time, there are fewer claimed beneficiaries than there are actual beneficiaries. In order to prevent beneficiaries from receiving the same benefits more than once, either through the same NGO or through different NGOs, a blockchain-based solution is used. Donors are unaware of the proper use of their funds. Another factor that causes donors to lose faith in charities is corruption. The suggested system makes use of smart contract-based incentives that can simultaneously verify various projects for social good with third parties aiding in their transparent execution without third party intervention. There is no negotiation involved in the verification process.

II.LITERATURE SURVEY

In paper [1], The author discusses the decentralized Ethereum blockchain-based system. It is not managed by a third party and has no centralized entity, such as a database, because it is a decentralized system. Each piece of information is stored as a transaction in the blockchain network. These transactions take place or work in accordance with a smart contract, which is a virtual representation of a written contract. The three main groups of system users are government agencies, non- governmental organizations, and donors and beneficiaries.

These users will hold accounts in the blockchain network andcan be uniquely identified by their 160-bit account addresses. In Paper [2], the application service layer, which is made up ofa variety of applications like account registration, charityposting data, financial donations, and information requests, iswhere the author discusses how users can directly access theplatform's features. The layer of smart contracts containsnumerous scripts and smart contracts. It includes details onquery strategies, transaction protocols, and other topics. Thedistributed accounting features of the platform for charitableorganizations are implemented by the Blockchain service layer. These features include packet blocks, reachingconsensus on a transaction, broadcasting blocks, and datasynchronization with a local.

In paper [3], the represents what charities, cooperative stores, givers, and recipients are responsible for. The website provides instructions on how to launch charitable endeavors and approach nonprofit organizations for help. Before making donations to the nonprofits or beneficiaries of a cause, donors use the website to research the causes. Beneficiaries can purchase and use tokens from cooperative stores after providing their information on the website for assistance. The charity platform is updated with the details of the store transactions. In exchange for tokens, the cooperative shops provide their clients with goods or services. Every transaction is recorded on the blockchain, allowing for transaction monitoring and fraud prevention.

In paper [4], the author talks about the system that will integrate charitable organizations. The platform's primary objectives are to facilitate charitable foundations' work with reporting documentation. Reports can be automatically generated because donation data is gathered in one location. By developing a shared platform based on blockchain technology, it improves the transparency of charitable foundations.

In paper [5], the author proposes about the crowdfunding careers of future donations. We formalized two predictive tasks on donation return and donor retention by gathering and analyzing extensive real-world data. then suggested a Joint Deep Survival model based on a data-driven methodology, i.e., JDS that could incorporate diverse traits to jointly model donation recurrence and donor retention. Additionally, several novel constraints were created and added to objective functions to model the censorship phenomenon and the dependencies between various behaviors in JDS training. In tests, it examined the contributions from crowdsourcing and verified JDS's ability to predict outcomes on two tasks from various angles.

In paper [6], the author suggests about blockchain-based solution that improved communication and mutual trust between aid organizations and NGOs in developing nations. Each node keeps a time-keeping table that enables the entity, whether an NGO or an donor, to insert its records unless it has participated as an active member in the system. Giving donors the freedom to give to those most qualified to receive their assistance, it establishes accountability for the use of donations linked to smart contracts. The custodian of fund- raised issues is reduced and increased accountability is achieved with blockchain technology. A donor will be assured that the quantity will meet the objective if distributed account technology is used in this situation.

III. PLATFORM FUNCTIONALITY

The platform's functionality was assembled with the help of a charitable foundation. Donor and Charitable Foundation actorseach represent a different aspect of the platform's functionality.
The capabilities of a charitable foundation are:

- Refresh the donation-related data.
- Foundations must be able to manually enter or submitREST requests for donation information.
- Inform the export.
  A charity can export the report to the Ministry of Justice and submit it for online publication based oninformation about donations.

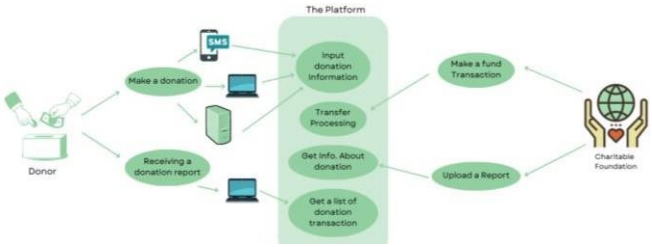

Fig.1. Platform functionality

IV. PROPOSED SYSTEM

There are four roles— charitable organizations, donors, beneficiaries, and cooperative stores were represented by the charity system's modes. Beneficiaries post their rescue data to the site for help, which is authorized by the nonprofit organization. As a result of reviewing projects, the charitable organizations receive the information they need to make their request for assistance. The platform educates donors about charitable endeavors, after which they give to the causes they are interested in. The cooperative stores serve the beneficiary groups by providing them with services or items such as books, groceries, and medicines in exchange for tokens. An organization that supports charity can convert the tokens into actual cash. The website gives guidance on how to start charitable initiatives and ask for assistance for nonprofit organizations. Donors use the website to research charitable causes before making donations to the cause's beneficiaries or nonprofits. Beneficiaries can use co-op stores to buy and spend tokens after submitting their information on the website for assistance. The charity platform is updated with the outcomes of the retail transactions. The co-operative stores offer goods or services to the recipients in exchange for tokens. The blockchain records every transaction, allowing for transaction oversight and money misuse prevention.

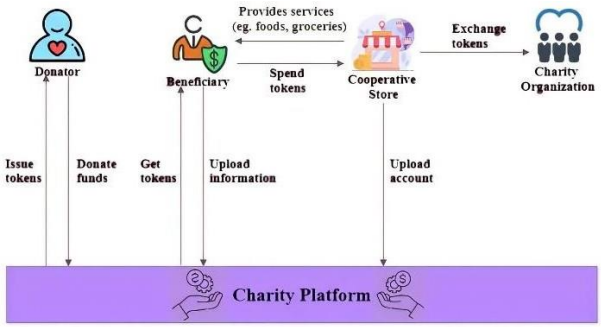

Fig.2. Block diagram of Proposed System

The transactions that have occurred in the stores are updated on the platform for charitable giving. The cooperative stores give the beneficiaries services or goods in exchange for tokens. On the blockchain, every transaction of money is tracked, allowing for transaction oversight and money misuse prevention. The blockchain contains a complete record of the flow of money, making it possible to track transactions and stop money from being used inappropriately. We separate the platform into four layers. Applications such as account registration, posting charitable information, monetary donations, and information requests are all included in the application service layer, which directly offers platform features to users.

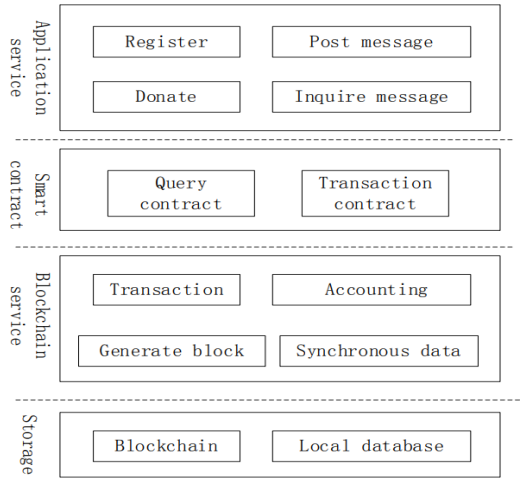

Fig.3. System Working

Various scripts and smart contracts are present in the layer of smart contracts. It contains information such as query techniques, transaction procedures, and so on. The distributed accounting features of the charity platform—such as packet block, consensus on transactions, broadcast block, and data synchronization with a local database—are implemented by the blockchain service layer. The data is kept in the storage layer, which also includes local and blockchain storage.

V. DATABASE DESIGN

Two types of reports are created for all charities. The Department of Justice uploads the second kind of report after the first type. Because the reports have various structures, the preparation process can take a while. The structure of database is appropriate for reporting for different charities. Third Normal Form (3NF) normalization is used for the database. As a result, adding new attributes is possible without making significant changes. Each entity in the database contains a flag indicating whether its hash has been added to the blockchain. The flag is turned to positive when data is written to theblockchain.

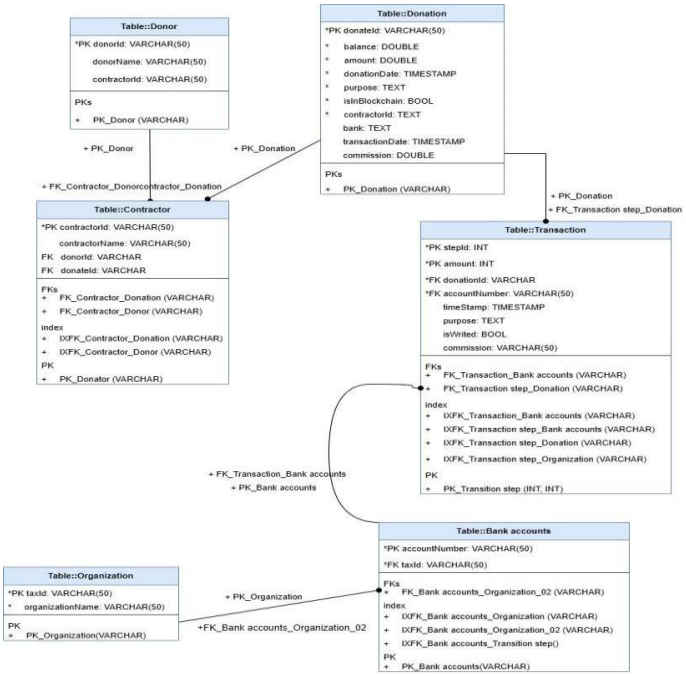

Fig.4. Database designing VI.TOOLS

USED IN PROPOSED SYSTEM

Ethereum: Blockchain technology was used to create the decentralized Ethereum global software platform. This statement is most recognized for its association with the cryptocurrency ether (ETH). Anyone can create secure digital technology using Ethereum. Vitalik Buterin, the creator of Ethereum, published a white paper in 2014 that acted as an introduction to the cryptocurrency. It is used as a token to pay for work done in support of the blockchain, but if accepted, it can also be used to pay for actual goods and services. Scalability, flexibility, enhanced security, and primarily decentralized features are all features of Ethereum.

Web3: Web3 is a proposed new version of the World Wide Web (WWW) that combines concepts like as decentralization, blockchain technology, and token-based economies. The third phase of internet development is known as Web3. The first two phases can be present in Web3. Although forums and message boards were present, most users of the Internet's first phase, known as Web1, read static web pages. The emergence of user-generated content-based websites like YouTube and other platforms, as well as social media like Facebook and

Twitter, signaled the start of the Web2 phase. According to Web3, users and creators could earn money from their online work by using the blockchain, or they could earn money by selling their data to advertisers in the same way that Facebook and other companies do now.

Blockchain: Based on peer-to-peer architecture, blockchain is a decentralized ledger created as a safe method of processing data. The distributed data architecture and transparency of blockchain technology are its two main uses. Through decentralized nodes or a third party for processing, blockchain technology acquires transparency. The blockchain chain network is composed of a series of data blocks that have been connected by various connected nodes. Following consensus acceptance, a new transaction is encrypted and connected to the previous transaction. One cannot remove a piece of data once it has been added to the chain. If an existing block needs to be modified, a new block listing the modifications will be created. The chain will be extended if the network's consensus accepts this block.

VII.IMPLEMENTATION OF SYSTEM

The project was developed using the Solidity Smart Contract system, and to test our contract, we used web3, ganache-cli, and mocha. The final Solidity contract as well as each of the individual modules is located in the contracts_classified directory. We have HTML, CSS, JavaScript, and the entire user interface of the Genuine Charity App on the frontend, along with the Admin Panel in the website folder. Including a test directory and test file, the contract can be deployed on the ganache and tested using web3 and the ABI. A production app may be constructed with the help of a sample React template by integrating the website and test code on the front end. Included is the code needed to deploy the contract on the Rinkeby Test Network and compile it using the Infuria node module.

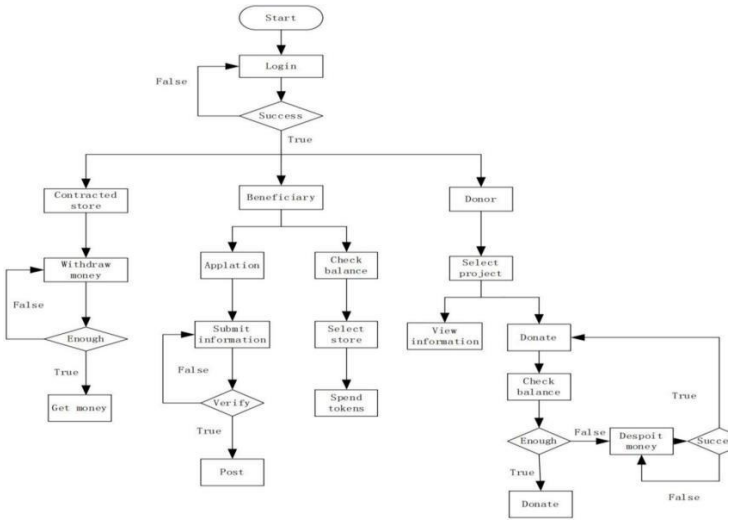

Fig.5. Systems flow diagram

The system is a website where user enroll and are given access to the system based on their role, which can be donor, beneficiary, or NGO (admin). Each user will be assigned a distinct username, password, and private key for their account, which will used to authenticate the user and give access to their own dashboard. The dashboard will enable the donor to give, track transactions, and view their overall contribution. Donors can obtain the most recent transactional status through tracking. The government body would have the authority to accept the demands made by the NGO.

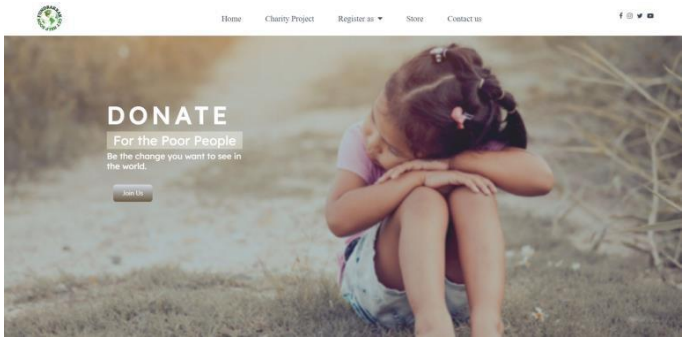

Fig.6. Home Page

Users who successfully sign up to become donors are then taken to their account section, where they can view approved projects that beneficiaries have submitted to this platform. Where they can see how much is needed for each project.

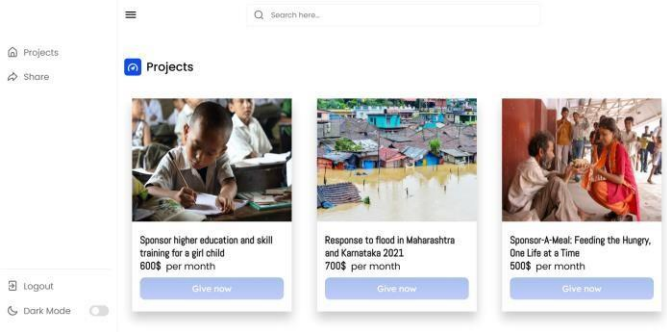

Fig.7. Project page

The Beneficiary can create a campaign in minutes on this platform, and because the campaign data is controlled by an Ethereum-based smart contract, it cannot be changed.

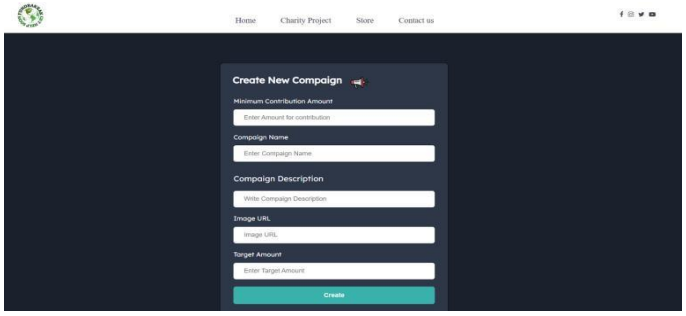

Fig.8. Create campaign

A campaign can be viewed on the home page alongside other campaigns that have been uploaded to the platform after it has been created. They are a conduit through which the donor can make a donation any campaign that one chooses.

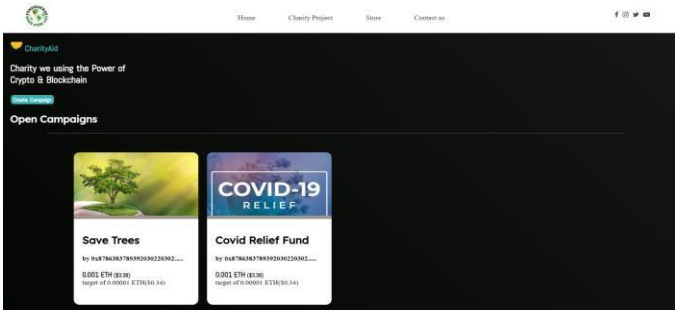

Fig.9. Campaign Created by Beneficiary (View Campaign)

NGO will be able to monitor every detail about this platform in the admin section. The administration will have access to information about donors and beneficiaries as well as projects submitted by beneficiaries that the NGO may accept or reject

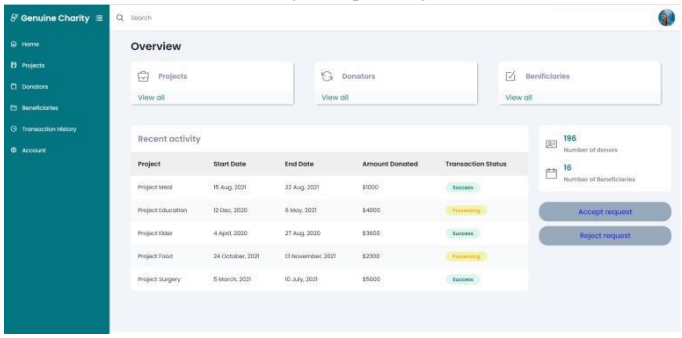

Fig.10. Admin Page

VIII. CONCLUSION

In this project, we established a new charity platform model based on blockchain technology after researching the combination of blockchain technology. Through the gathering and analysis of real-world data, we formalized two tasks for forecasting donation recurrence and donor retention. Users can safely use funds with smart contracts and complete the donation process in this system. In order to achieve money trackability and increase charity transparency, all transactions are documented on the blockchain. With this blockchain-based charity system, the lack of transparency in charitable activities can be technically solved, which might boost public confidence in charitable organizations. A Dapp we created has realized and validated certain basic elements. Our next step will be to create a whole charity-based blockchain system.

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