CHARITY SYSTEM USING BLOCKCHAIN

PROJECT REPORT

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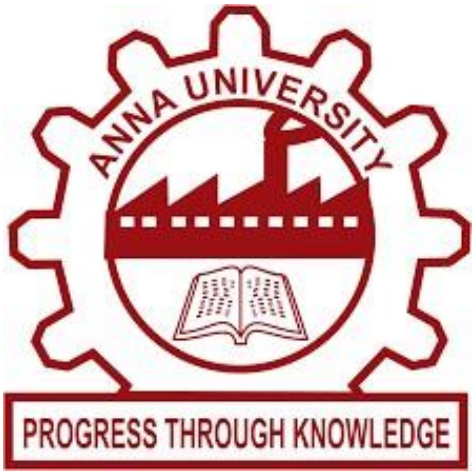
CS6611 - CREATIVE AND INNOVATIVE PROJECT



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BONAFIDE CERTIFICATE

Certified that this project report "**Charity System using Blockchain**" is the bonafide work of "**Morareddy Rahul Reddy, Ashwin Menon, Vignesh Kumar K**" who carried out the project work as a part of Creative and Innovative Project Laboratory.

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Abstract

The charity organisations around the world lack transparency and the supervision of them is difficult to achieve, which reduces willingness of the general population to donate. To rectify this problem a system is proposed built on blockchain technology to increase the transparency of charities to enhance the public's trust in charities and promote the development of philanthropy by blockchain-based charity system. First the beneficiaries must register themselves and provide the necessary information about them. The donors, i.e the people who are donating their money can thus see who the beneficiaries the particular organisation has partnered with, and can also vote on whether to support a given beneficiary or not. The choice voted by the majority is taken as the decision. After this is done the donors can view the transactions which the charity organisations are making to ensure that the money is going where it is supposed to and that there are no wrongdoings. This system , thus solves the main issue with the current system which is the lack of transparency for the donors.

Chapter 1

Introduction

Business runs on information. The faster it's received and the more accurate it is, the better. Blockchain is ideal for delivering that information because it provides immediate, shared and completely transparent information stored on an immutable ledger that can be accessed only by permissioned network members. A blockchain network can track orders, payments, accounts, production and much more. And because members share a single view of the truth, you can see all details of a transaction end to end, giving you greater confidence, as well as new efficiencies and opportunities.

Blockchain helps in the verification and traceability of multistep transactions needing verification and traceability. It can provide secure transactions, reduce compliance costs, and speed up data transfer processing. Blockchain technology can help contract management and audit the origin of a product. It will create a trusted, unfilterable, un censorable repository of data and information that is accessible worldwide. It is this characteristic that will drive the creation of the third generation of the internet. And this is why the blockchain is the future of the internet

A charity management system is a software solution for a nonprofit organization. It manages the charitable donations and also the donor base. Such a system includes features such as electronic fund transfer, donation management, fundraising, donor management, and event management.

1.1 Problem Statement

The real world charity are not transparent and hence are not trust-worthy. Donors are not willing to donate even though they are interested in donating the same due to lack of trust. There is also no proper system for checking to validate beneficiaries. To solve these problems this system was proposed which is a decentralised application that is built on the blockchain.

1.2 Objective

This system hopes to increase the transparency of charities to enhance the public's trust in charities. This will promote the development of philanthropy which is much needed in the current times. The whole process must be easy from start to finish for all users so that they do not face any difficulties. The application is based on Ethereum blockchain platform for data records. This is a transparent and trust worthy alternate for traditional charity system.

Chapter 2

Literature Survey

G. Renat et al [5], 2021 proposed an system blockchain-based Karma platform is implemented on top of Hyperledger Fabric and appears as a social apparatus that allows charity funds to manage and maintain their projects, accept donations and share auditable public trail of all activities within the platform. NPO employees initiate a charity project. All the representatives must pass Know-Your-Customer (KYC) verification.

E. Shaheen et al [4], 2021 proposed this system concerns eliminating the absence of monitoring and censorship of charities. First Application and registration of beneficiaries is done after which the verification of the beneficiary social case takes place. The Donor then makes a decision to donate or not. After which a government organization receives the funds. The charities then receive the donation. The report is then sent to the donor by the beneficiary. The implemented system saved time, reduced the cost of donation, and reduced the risk of reaching suspicious campaign donations or terrorist projects.

A. Singh et al [2] ,2020 proposed this an decentralized system where the donor purchases tokens from the system. Government entity verifies and approves the details of the NGO and the requirements it has raised, after which the donors can donate the tokens.But the system deals with tokens which may not be widely accepted by the general population and hence may not be as useful or effective as normal currencies

H. Saleh, S. Avdoshin & A. Dzhonov [6] ,2019 proposed this project uses the Ropsten Ethereum test network. The use of blockchain technology in domestic charitable organizations, both individually and at the state level, will make donations not only more effective and reliable, but also more attractive to donors. It will also help to increase revenues. The one problem is that the project is integrated with a client/server architecture, thus making the database vulnerable.

Pratyush Agarwal, Shruti Jalan& Dr.Abhijit Mustafi [7], 2018 proposed a system charity more transparent and trustworthy where the charity by individuals or organizations is done first and then that work can be sold later as a stock (here we call it a certificate).So, people can raise money out of it, just like stocks but finally the money would go to the charities. This will help get rid of middle men between donors and charity doers. But There is no central idea/project to which the donors are contributing money towards.

Ashutosh Ashish Khanolkar et al [1], 2020 proposed this system
to provide a transparent, secure and trustable platform for charity donations by minimizing the frauds and middle-party interference between the transactions. There are mainly three actors: Donor, Charity Organization and Needy Person. Donors can choose the particular cause from the respective list and can donate an amount. All this transaction process is decentralized and maintained under Blockchain ledger. There is no one to verify the request of the needy person and also for the donors to vote.

Pooja Molavade et al [8] ,2021 proposed an algorithm there is no central authority present to validate and verify the transactions, yet every transaction in the Block

chain is considered to be completely secured and verified. Here we are using the Proof Of Work Algorithm. It is the consensus algorithm in a blockchain network. Blockchain technology acquires transparency by removing the centralized node or any third party for processing. This system would facilitate an individual to contribute independently to society using their time and abilities apart from just money, and ultimately this will lead to an increase in hands towards the society.

Baokun Hu , He Li [3],2020 A charity system based on blockchain technology aiming to increase the transparency of charities to enhance the public's trust in charities and promote the development of philanthropy by blockchain-based charity system.Donors learn about charity projects on the platform, then donate to beneficiaries or the charity organizations.Beneficiaries upload their information to the platform for help, they can get and spend tokens in cooperative stores. The transactions occurring in the stores will be uploaded to the charity platform. The tokens may not be approved by stores which can lead to lot of problems for the beneficiary.

Chapter 3
Proposed System

3.1 System Architecture

There are 3 users in the application they are donor, validator and beneficiary who all interact with a website. Beneficiaries can create projects to which the donors can donate to. When needed the Beneficiary can create a request, asking for a specific amount of money. The requests are sent to the validators who check a given set of criteria to approve/reject a given beneficiary request. Once the validator approves a given request, all the donors who donated to the project which the request comes under can decide to vote or not. The Validator closes voting and if more than half the donors voted and sufficient amount of money is present, then the beneficiary is given the requested amount. Else, the request is rejected.

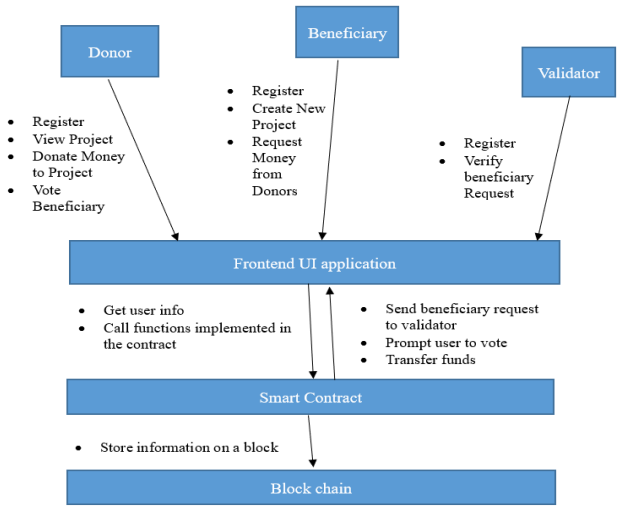

Fig 3.1.1 Architecture diagram

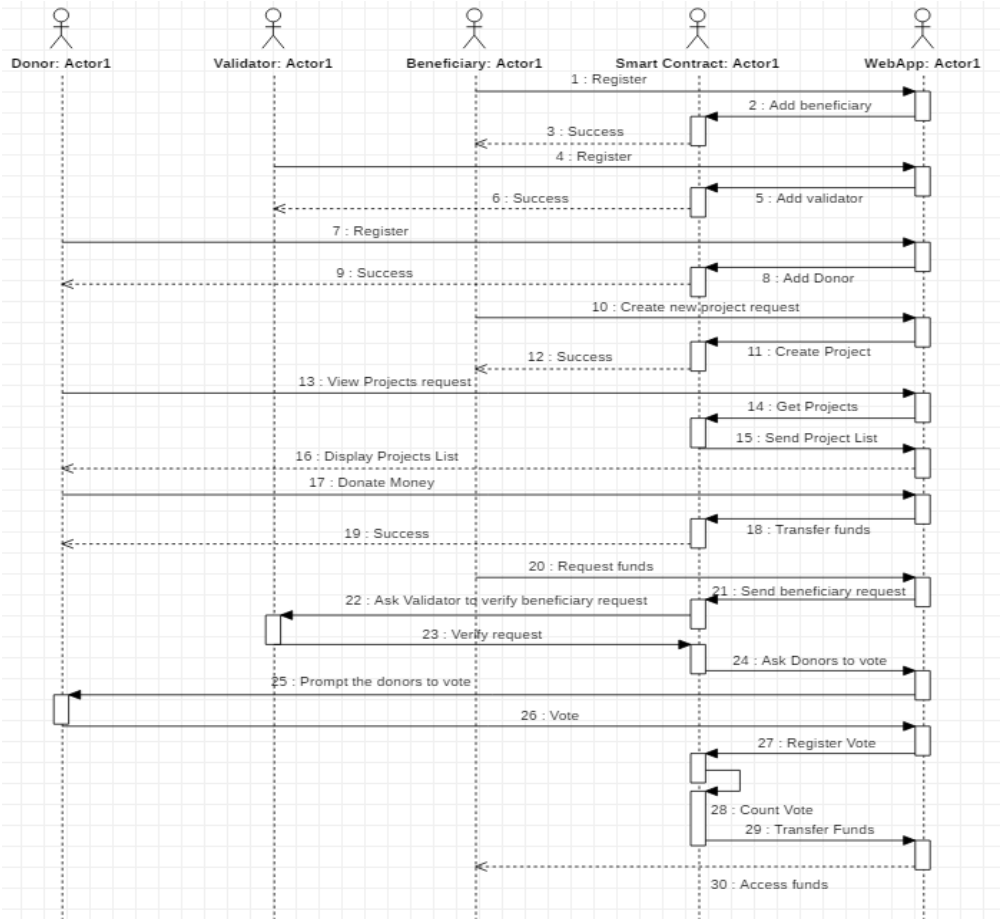

Fig 3.1.2 Sequence Diagram

3.2 Proposed System

The main problem with traditional charity systems is the lack of trust which the donors have with the system and lack of involvement in the beneficiary choosing process.

The system aims to solve these problems by using a blockchain system, making all the transactions transparent. Also once the beneficiary's request is approved, the

donors are given a choice on whether to vote or not. If the majority of the donors voted, then the money is sent to the beneficiary.

3.2.1 Building the Frontend UI of the application

Design the website using UI/UX tools. Implement the design for Login/Signup Page using React and other necessary libraries. Implement the design of the Dashboard for the different types of users using React and other necessary libraries.

3.2.2 Write the functions for beneficiary in smart contract.

Implement a function so that the beneficiaries can create a new project with the necessary info using solidity. Implement a functionality where the beneficiary of a particular project can request funds from it using solidity. If the request is approved, implement a function where the funds are sent to the beneficiary.

3.2.3 Write the functions for donor and validator in smart contract.

Implement a function in solidity which returns all the projects created by the beneficiary so that the user can view them. The donor must be able to choose a project and donate funds to it, the contract must store this money with itself. Once a beneficiary requests for funds, the validators must be able to view the details of the request so that they can approve or reject it. Once this is done the contract must request the donor to vote and check what is the result of the majority. If majority approves, then the funds must be sent to the beneficiary.

3.2.4 Connecting the smart contract to the frontend UI.

First the smart contract which was created in the previous 2 modules must be deployed in the ethereum test network. After this, we have to install the ethers.js library in the frontend. Using this library we can interact with the smart contract and add the necessary interactions within the website which can call the functions of the smart contract.

Chapter 4

Results and Discussion

This is the landing page of the application where the user can either log in or register as shown in Fig 4.1

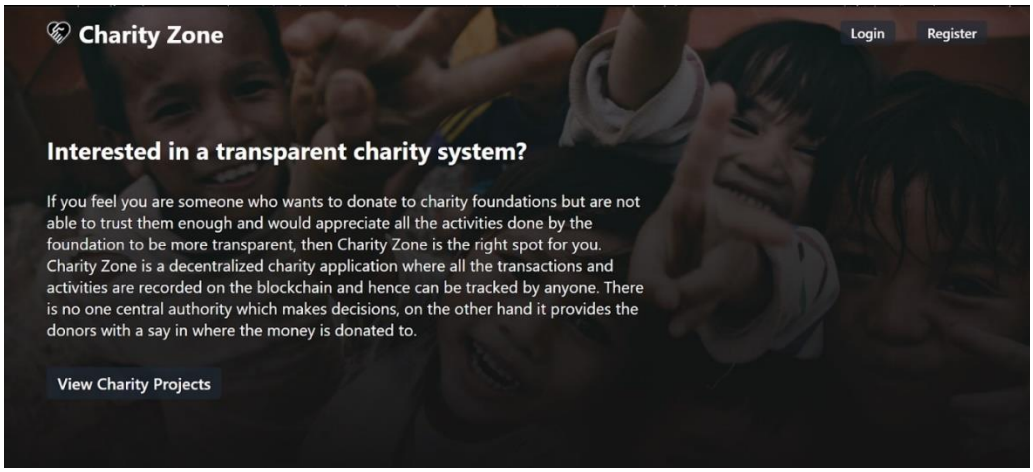

Fig 4.1 Landing page

Registration page for new users which includes donor , beneficiary ,validator.

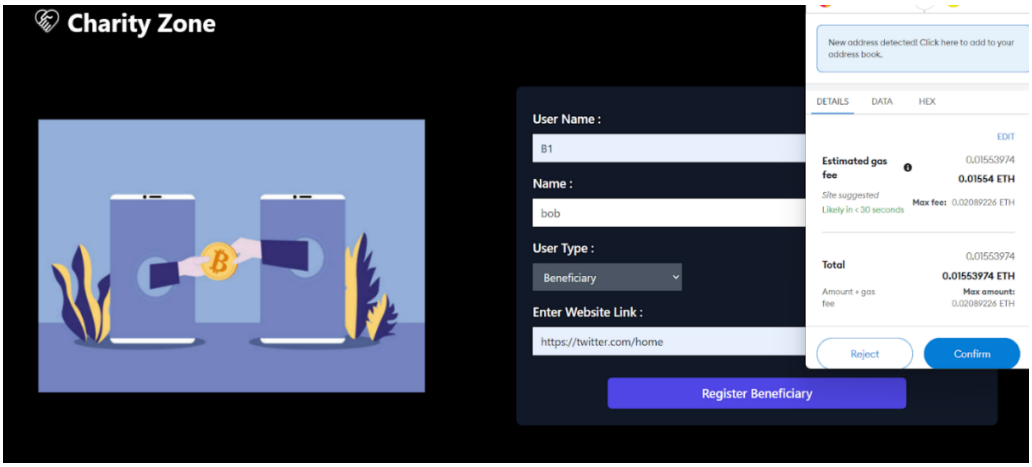

Fig 4.2 Register page.

Beneficiary dashboard where user can create project , request ,check status as shown in Fig 4.3

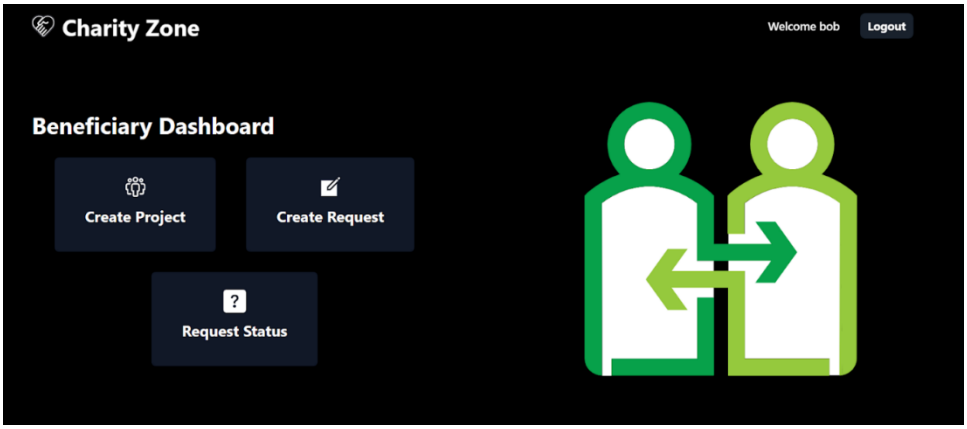

Fig 4.3 Beneficiary home page

This below Fig 4.4 represents the page where beneficiary can create projects.

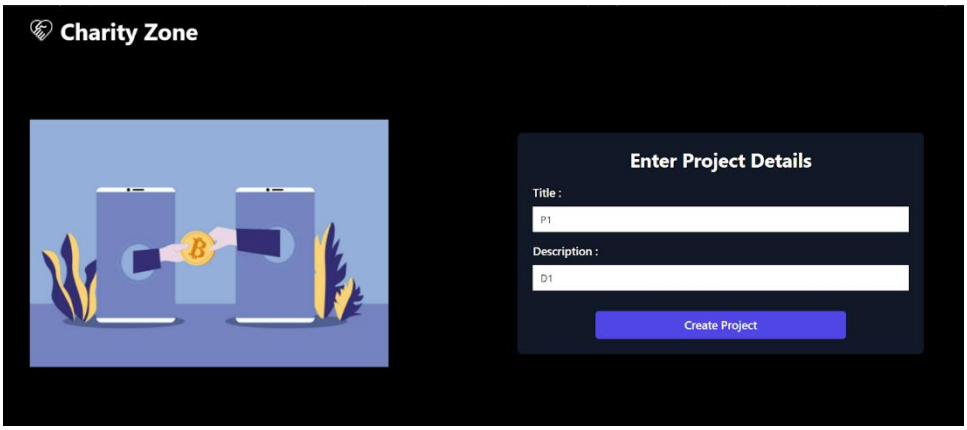

Fig 4.4 Create Project

Request can be created for project by beneficiary as shown in Fig. 4.5

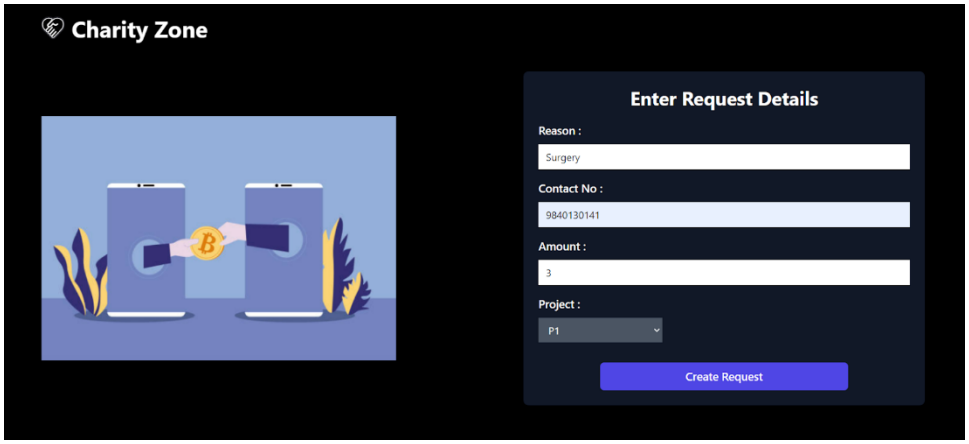

Fig 4.5 Request for project

Beneficiary can view the status of request as shown in Fig 4.6

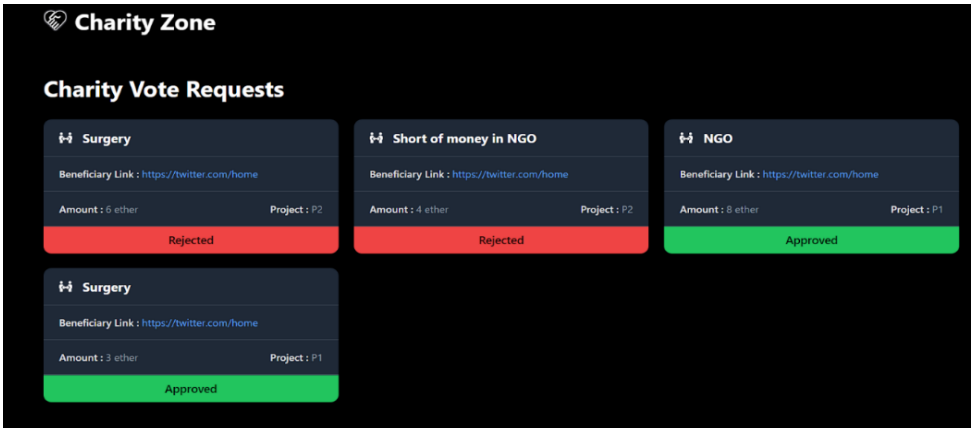

Fig 4.6 Status of request

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This represents the registration of validator which includes validator secret key is required.

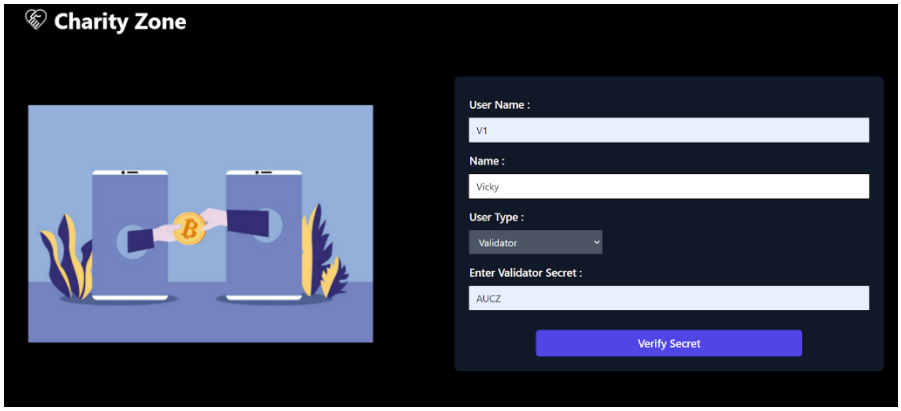

Fig 4.7 Validator Register page.

Validator dashboard where he can handle requests, close voting, check validation criteria.

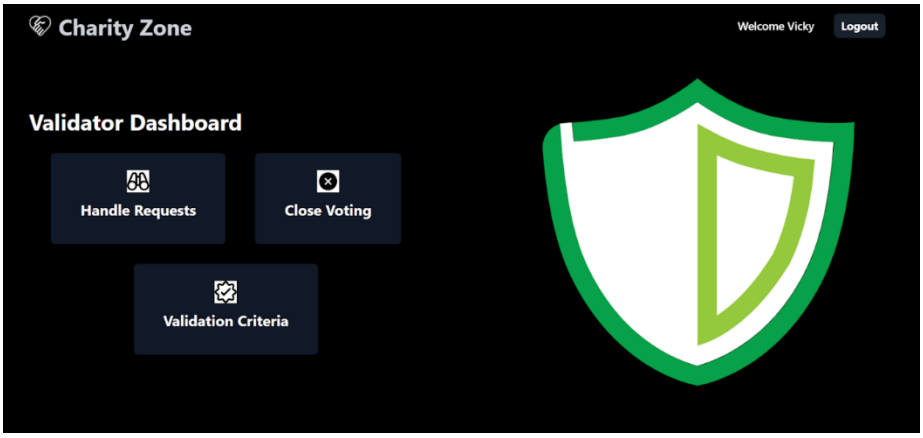

Fig 4.8 Validator dashboard.

Criterion conditions to check for approving/rejecting a request.

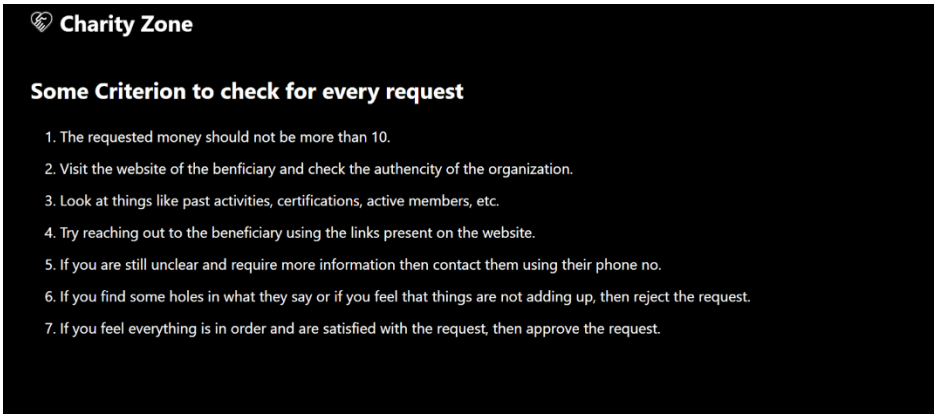

Fig 4.9 Criterion conditions

Page where the validators can approve/reject requests

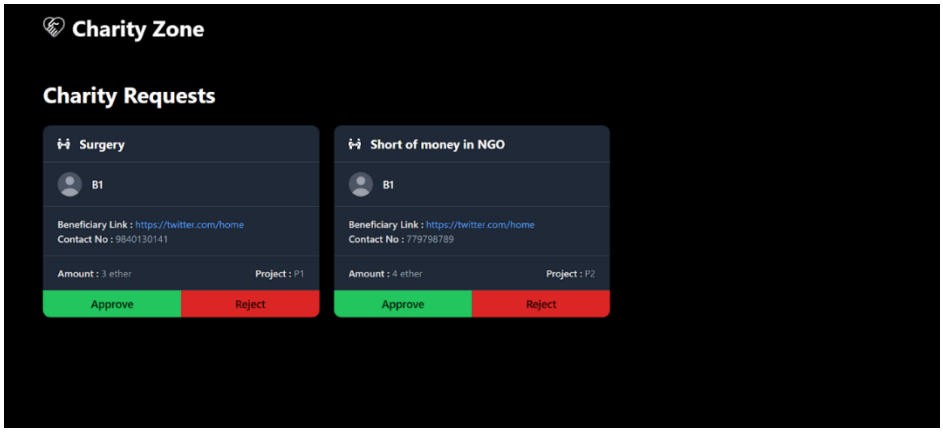

Fig 4.10 Validators can approve/reject requests

Page where validators can close voting for the donors as shown in Fig 4.11

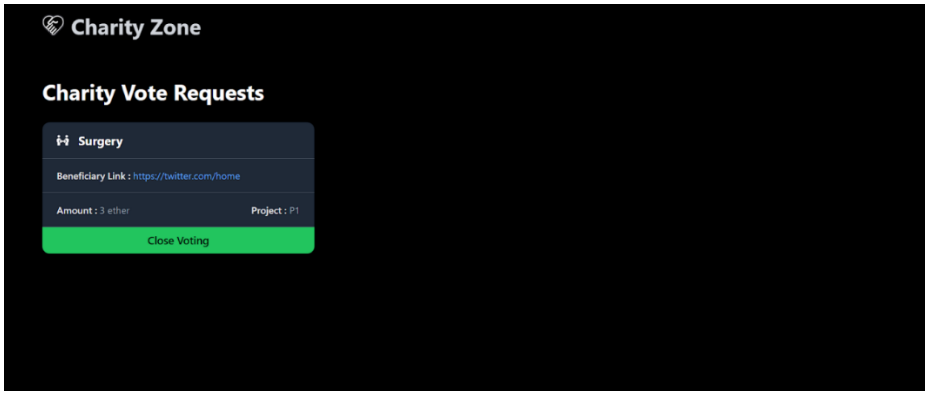

Fig 4.11 Validators can close voting for the donors

Registration page for Donor users as shown Fig 4.12

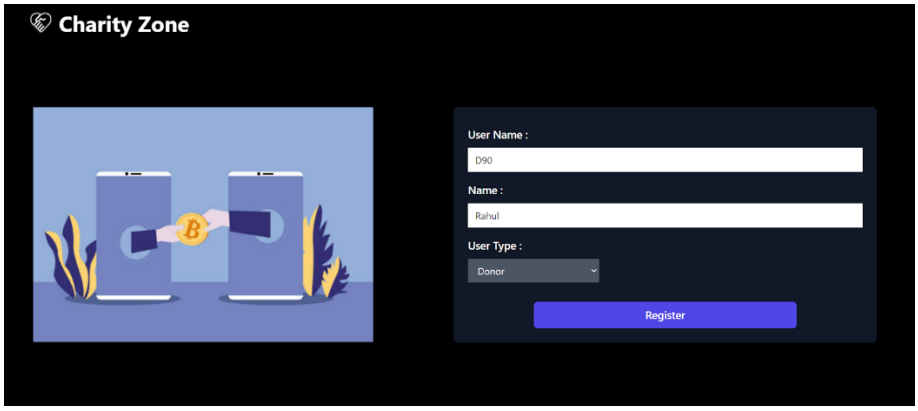

Fig 4.12 Donor Register page.

Donor dashboard where he can donate to projects, vote requests, and check vote result.

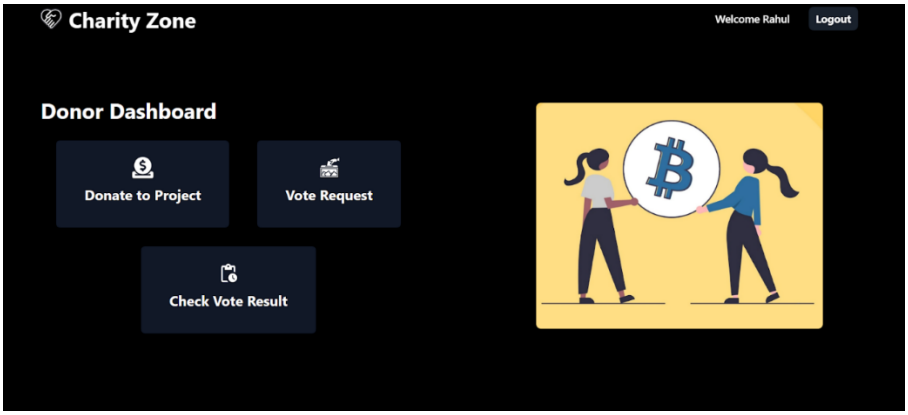

Fig 4.13 Donor dashboard

Page where donor can donate to the project of their choice

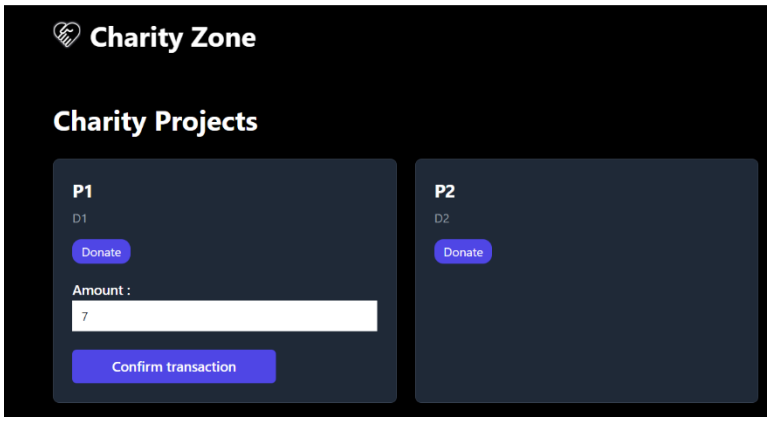

Fig 4.14 Donating section

Page where donor can vote for a request belonging to a project they previously donated to.

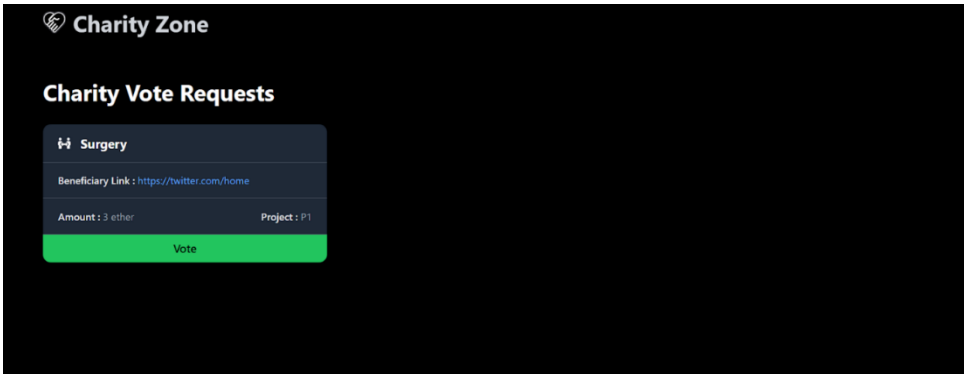

Fig 4.15 Donor can vote for a request

Page where donor can check the voting results of all previous requests

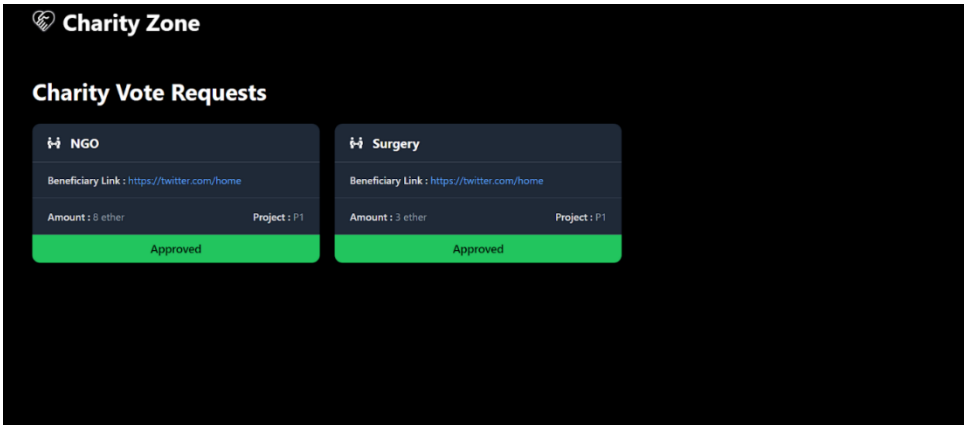

Fig 4.16 Donor can check the voting results

Chapter 5

Conclusion

As a result, a decentralised charity platform has been devised and implemented where all donors can donate the money and track it. The validators only approve the beneficiary requests after intense background checks thus making them very reliable and trust-worthy. The beneficiaries are provided with a simple system to get funds, thus making it less cumbersome for them. Decentralization helps in making the application secure, resistant to censorship , internet disruptions , and potential social monopolies.

5.1 Future Works

There can be a separate beneficiary certification which can verify a given organization so that the validator’s process is easier. The UI can be made more simpler to increase the ease of access. The security measures in the contract may be improved in the future with more improvements.

Appendices

Code for registering new user:

```
function register(string memory _username,string memory _name,string memory _usertype)
public {

        require(bytes(usernames[msg.sender]).length==0,"User exists");

        require(users[_username].wallet == address(0),"Username taken");

        users[_username] = User({

            wallet:msg.sender,

            name:_name,

            username:_username,

            usertype:_usertype

        });

        usernames[msg.sender] = _username;

    }
```

Code for creating new project

```
function createProject(string memory d,string memory t) public {

        require(keccak256(abi.encodePacked((users[usernames[msg.sender]].u

sertype)))  == keccak256(abi.encodePacked(("beneficiary"))));

        Project storage newProj = projs[numProjs];

        numProjs++;
```

```
        newProj.title=t;
        newProj.description=d;
        newProj.creator = msg.sender;
        newProj.donors = new address[](0);
        newProj.amt=0;
        newProj.projectId=block.number;
        ProjDetails memory temp = ProjDetails(t,d,0,0);
        projDetails.push(temp);
    }
```

Code for creating new request

```
function createRequest(string memory r,uint amount,uint projId,string
memory phno) public {
        require(keccak256(abi.encodePacked((users[usernames[msg.sender]].u
sertype)))
        == keccak256(abi.encodePacked(("beneficiary"))));
        Request memory temp =
Request(r,payable(msg.sender),usernames[msg.sender],amount,block.numb
er,beneficiaryLinks[msg.sender],projs[projId].title,projId,phno);
        requests.push(temp);
    }
```

Code for allowing donor to donate money

```
 function donateMoney(uint projId) public payable {
        require(keccak256(abi.encodePacked((users[usernames[msg.sender]].u
sertype)))
        == keccak256(abi.encodePacked(("donor"))));
        projs[projId].donors.push(msg.sender);
        projs[projId].contributions[msg.sender]+=msg.value;
        projs[projId].amt+=msg.value;
        projDetails[projId].amt+=msg.value;
        projDetails[projId].donorCount++;
    }
```

Code for closing the donor voting

```
function makePayment(uint _reqNo) public {
        require(keccak256(abi.encodePacked((users[usernames[msg.sender]].u
sertype)))
        == keccak256(abi.encodePacked(("validator"))));
        voteRequest storage thisRequest=voteRequests[_reqNo];
        voteRequestDetails[_reqNo].verified=true;
        if(thisRequest.noOfVoters >
(projs[thisRequest.projId].donors.length)/2){
            if(thisRequest.amount<=projs[thisRequest.projId].amt){
                uint256 e = uint256(10)**uint256(18);
```

```
            voteRequestDetails[_reqNo].approved=true;
            thisRequest.recepient.transfer(thisRequest.amount*e);
        }
    }
}
```

References

1. Ashutosh Ashish Khanolkar , Ashish Rajendra Gokhale , Amrish Sanjay Tembe, Vinayak A Bharadi “Blockchain based Trusted Charity Fund International Journal of Soft Computing and Engineering” July 2020.

2.A. Singh, R. Rajak, H. Mistry and P. Raut, "Aid, Charity and Donation Tracking System Using Blockchain," 2020 4th International Conference on Trends in Electronics and Informatics (ICOEI)(48184), 2020.

3.Baokun Hu and He Li, “Research on Charity System Based on Blockchain”, 2020 IOP Conf. Ser.: Mater. Sci. Eng.

4.E. Shaheen et al., "A Track Donation System Using Blockchain," 2021 International Conference on Electronic Engineering (ICEEM), 2021.

5.G. Renat, A. Peresichansky, A. Belenov and A. Barger, "Karma - blockchain based charity foundation platform," 2021 IEEE International Conference on Blockchain and Cryptocurrency(ICBC), 2021.

6.H. Saleh, S. Avdoshin and A. Dzhonov, "Platform for Tracking Donations of Charitable Foundations Based on Blockchain Technology" 2019 ,Actual Problems of Systems and Software Engineering (APSSE), 2019.

7.Pratyush Agarwal, Shruti Jalan and Dr. Abhijit Mustafi, “Decentralized and financial approach to effective charity” International Conference on Soft-computing and Network Security (ICSNS)2018.

8.Pooja Molavade , Apeksha Sable , Shweta Sanas Prof. H.B. Sale “TRANSPARENT CHARITY APPLICATION USING BLOCKCHAIN” , April 2021.