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# Charity Donation System using Blockchain

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**ABSTRACT:** It is very common for organizations to receive anonymous donations. Centralized financial services are prone to corruption. There is a need to expand the distribution of resources. This can be achieved through blockchain. It is a transparent, distributed and distributed technology that operates without a central control element. The main purpose of the system is to eradicate corruption in organizations that legitimize people's black money or regulate resources. The system will be separate, not owned or used by an individual or organization but rather shared between users. We have created a blockchain-based Donation System that can streamline the resources used by a particular organization. The user can create any new campaigns and others will be able to donate money to the organization in the form of ether.Proposed system makes people real owners of resources and brings transparency to the entire Charity Donation System. Thus, making wrong and illegal use of money donated to organizations will be minimized to a great extent and thereby, corruption will be reduced with the use of this blockchain system, solving problems in many nations.

**Keywords:** Blockchain, Ethereum,Smart Contracts, Cryptocurrency, Consensus.

## I. INTRODUCTION

Charity is an important part of a democratic society. It is well-known that there are many incidents in this world that cause terrible losses, whether related to wealth or health and causing severe damage every year. In order to recover from the various types of losses many victims need help from charities that can provide financial assistance for basic needs. Now people love to dedicate themselves to the community. Charity, therefore, is the fastest growing sector in the modern world and has shifted from its traditional organizational system to a crypto-currency-based system. The traditional system around the world suffers from various problems such as lack of transparency, mistrust between donors and charity organizations.There is a need to allow donors to track their donations and deliver openly in social support. Blockchain is a remarkably transparent and dedicated platform for storing these different types of services based on helping the needy. We will therefore propose a blockchain-based charity donation system that serves as a platform for donating money in form of cryptocurrency(Ethereum) to other need users who have requested a donation and all this happens under high security and full trust. The purpose is to ensure that tracking of a person's contribution, and keeping money safe. This will help address the decline in public trust in charities. With blockchain, donations will be much higherpublicly. The giver will be able to track his or her donations to help the poor, and beyond.The Donation System uses a blockchain to record everything that is done. Due to such properties of blockchains for data consistency and resistance, it further enhances project transparency and accountability.

## II. LITERATURE SURVEY

In this paper, we explore existing fundraising suggestions in a few domains and identifying research spaces.The issue of the openness of the donation system has long been debated. Emphasis on transparency, on the otherhand, introduces privacy issues to donors and recipients, other people who want to hide donations or moneyreceipts. To reduce unintended consequences, a donation system that ensures transparency and anonymity is essential.We have created a system that protects our personal information using a one-time blockchain-based account system. The created system has the potential to contribute to the development of a culture and environment for sustainable and safe giving.Blockchain technology is currently being used in a variety of industries. 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 donation tracking platform that will track all information about donations, and donors. The system uses blockchain technology to provide donors, charities, and recipients with transparent accounting for services. The donation forum should have a clear

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donation pathway, which allows community users and donors to track and monitor where, when, and to whom donations are made. This paper proposes a decentralized system, based on the Ethereum blockchain. It enables social enterprises to run programs in a transparent manner through smart contract-based incentives to ensure that their impact is independently authorized and accessible to all. This makes it easier for donors (charities, influential investors, and small donations) to track their transactions and, as a result, restore their faith in charity organizations.

## III. PROBLEM STATEMENT

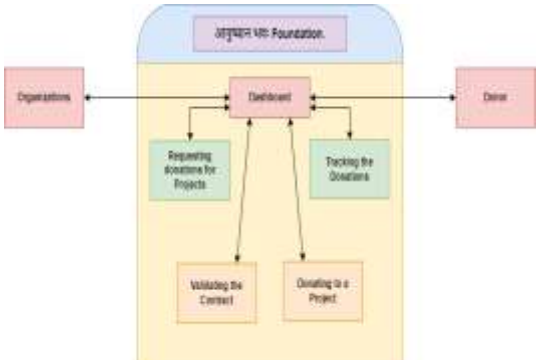
The traditional system around the world is facing various problems such as lack of transparency, mistrust between donors and charities. There is a need to allow donors to track their contributions and contribute freely to community support. Blockchain is a transparent and remarkablydedicated platform for storing these types of services based on helping the needy. We will therefore propose ablockchain-based donation system that serves as a donation platform for other users in need of donation and all of this happens under high security and full trust.

## IV. PROPOSED SYSTEM

The proposed system overcomes the drawbacks of traditional charity donation system. The donors will be able to track their donations and hence maintaining transparent, secure and trustful platform for charity donations by minimizing the frauds and third-party interference .

Objectives of Charity Donation System:

1. Trust: To establish trust between the various categories of organizations that help the poor as donors and members of the charity.
2. Authenticity: By verifying and validating the various stakeholders and the user increases transparency and trust in the field of charities.
3. Security: Providing safe and secure services for charity that help the community by reducing fraud and interference.
4. Decentralization: The division of the system helps the organization to keep the activity undisturbed and unadulterated by any other member who maintains security and transparency.
5. Immutability: Once the data is stored on blockchain, it cannot be changed.



The system consists of users that play a major role which is classified as the donor, organizations/beneficiary. These users will be account holders in the blockchain network and each of them can be uniquely identified in the network through their 160 bit account address. They can access their accounts, perform and sign transactions using 256 bit private key.

The system's functioning is depicted for two sorts of actors (donor and charityorganization/beneficiary)

A. Organization/Beneficiary: These represents the entity that work for social cause. Proposed charity donation system allows them to raise their requirements as per specific format over the system.
B. Donor: The donor will browse at the projects of charities and chooses one to donate. The system will check the donor account balance. If the balance falls below a certain limit, the user will be prompted to make a deposit. Only if the balance is sufficient then the contribution can be done.

The Proposed System consists of Technologies such as Ethereum Cryptocurrency,Consensus Algorithm, Ethereum Virtual Machine, Smart Contracts,Metamask, transaction, and Ethereum network.

A. Ethereum: Ethereum is a platform powered by blockchain technology that is best known for its native cryptocurrency, called ether, or ETH, or simply Ethereum. The distributed nature of blockchain technology is what makes the Ethereum platform secure, and that security enables ETH to accrue value.
B. Consensus Algorithm:Consensus is the backbone of the Blockchain and a key feature of any blockchain platform. It plays an important role in ensuring the network security, integrity, and performance.The consensus algorithm is responsible for providing the distributed consensus mechanism in the blockchain that essentially governs the order of the blocks. A critical component of this layer is the proof

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protocol (e.g., proof of work and proof of stake) that is used to verify every single block, which ultimately is used to achieve the required consensus in the system.The most popular consensus algorithms are Proof of Work [POW] and Proof of Stake[POS]. POW is widely used consensus algorithm.

C. Ethereum Virtual Machine:EVM provides a runtime environment for each node toexecute their instructions. It translates the smart contractinto a set of instructions that are executed by thenodes/computers. For each transaction, there is gas fee associated with payments to miners who verify and add transactions to the blockchain network and must be paid by the sender account who initiates the transaction.

D. Ethereum Network: Our system is deployed on local test network (Ganache). An unauthorized or open network, not controlled by any organization, anyone can join the network, and all users are equal; they can read and write without limits. These blockchain network is considered to be completely decentralized. Transparency is the most significant advantage of the public network. However, theresome of the disadvantages of the public Network and that includes slow performance compared to other networks, scalability issue though some steps are already taken to solve this problem such as off-chain.

E. Smart Contracts:Smart Contracts is basically a set of rules that most parties agree on in a blockchain network. It helps to make transactions transparent that avoids third party use and brings about decentralization in the system. These rules are executed in the form of digital code. They can only be deployed once in a blockchain network and cannot be modified. The proposed system executes smart contracts which consists of following functions:

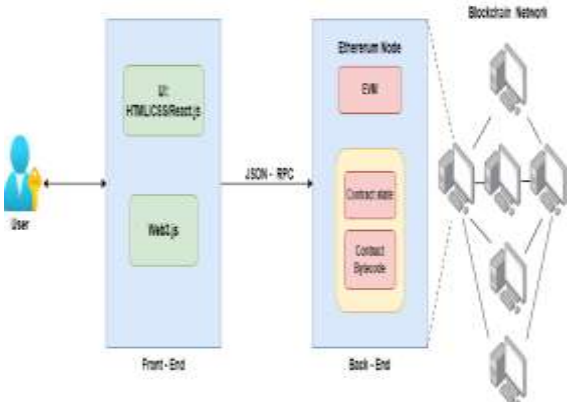
a) function createProject: used to enter all mission details.
b) function Contribute: used to check whether deadline is passed or not and make donations.
c) function claimFunds: once the goal amount is reached, the creator can claim the goal amount.
d) function getRefund: if the goal amount is not reached, the creator of mission can initiate refund to the donors who donated towards the failed mission.

F. 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.

G. Transaction: As the proposed system is implemented on Ethereum blockchain, it executes each function of smart contracts in the form of transactions. Following is the structure of transactions:

- From: It is the 160 bit address of sender which initiates the transaction
- To: It is the 160 bit address of the receiver which receives the transaction. It is null when new smart contract is deployed.
- Nonce: It represents the number count of transaction and is initialized from 0.
- Data: It contains all interactions with the contract. While newly deploying contracts it contains contract's byte code.
- Gas Price: The miner charges the sender a specified gas unit for each step while processing a transaction. So, the gasPrice is the cost of each gas unit in wei (1wei =10^-18Ethers)

## V. SYSTEM ARCHITECTURE




The System Architecture consists of two major parts – front end and back end :

1) Front -End: The frontend is the User Interface of the system which is capable to interact with Ethereum blockchain system. The front end is developed using HTML, CSS and React JS. React is a JavaScript library for building user interfaces. React is used to build single-page applications. React allows us to create reusable UI components. Second component used in front-end is Web3js.web3.js is a collection of libraries that allow you to interact with a local or remote ethereum node using HTTP, IPC or WebSocket.
2) Back-End: The back-end of the website is developed using solidity smart contracts and it consists of the Ethereum node connected to the blockchain network. Each node consists of an

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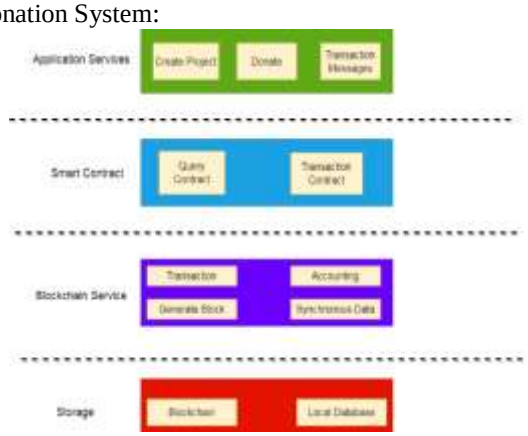
EVM that translates smart contract to set of instructions and converts them to bytecode and then deployed to the blockchain by the miners in the network. The user accesses the backend services by connecting to Ganache – a personal blockchain.

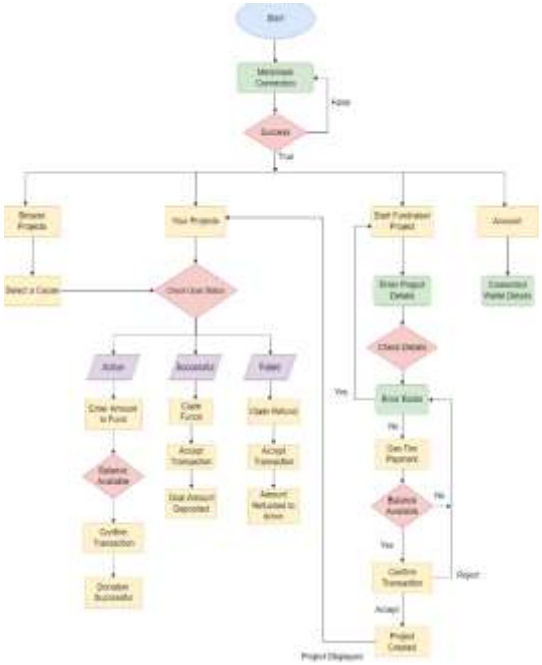
Following is the modular architecture of Charity Donation System:




As shown in the figure, we split the system into 4 layers:

1. Application Service Layer: It consists of range of application such as entering mission details, donate, view missions, status of missions.
2. Smart Contract: Scripts and smart contracts are included in the smart contract layer. It contains querytechniques, transaction processing, and other information.
3. Blockchain Service: The blockchain service layer performs the charity platform'sdistributed accounting operations, such as package block, get transaction consensus, broadcast block, and synchronisedata to a local database.
4. Storage: It contains all the synchronised data.

## VI. METHODOLOGY



Proposed Blockchain based Charity Donation System has total 5 different functions such as:

1. Start Fundraiser Mission: This page allows the organization to enter all necessary details related to mission such as title, description, goal amount and mission deadline (in minutes).
2. Account: This page will display the connected wallet account details(160 bit) of the current connected user.
3. Your Project: This page will display all the missions raised by the current connected account user(Organization). The mission can have status such as Active(Mission deadline is not over and is open for donations), Successful(Mission whose goal amount is met and deadline is reached) or Failed(Mission whose deadline is over and goal amount is not met). It also has options such as Claim Funds (if goal amount and deadline is met) where the goal amount is deposited in organization's Metamask wallet.
4. Your Contributions: This section contains all the payment made by the current connected user to its own mission. It also contains Refund option (if goal amount and deadline is not met) where the donated amount will be refunded back to the donors to their respective Metamask wallet.
5. Browse Projects: This page contains all the missions created by the current connected account and by other organizations. The current user can donate towards any mission mentioned in this page irrespective of creator of mission.

## VII. RESULTS

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**Fig. Homepage1**


**Fig. Connected Wallet Details**


**Fig. Create Project**


**Fig. All Projects**

## VII. CONCLUSIONS & FUTURE WORK

We have proposed a program that uses Blockchain and ethereum for the poor to make it more visible through a decentralized system. Moving to cities has made many people very anxious about other people and this has made many people indifferent. But at the same time there are also people who want to ultimately make illegal money into the system. This program will provide both authenticity and better security. Also, it will provide a reliable system and will make the whole process more transparent. This will help eliminate mediators between donors and service providers.Because the system does not depend on third party sources to transfer funds, the speed and cost of hosting services are reduced. The scope of Blockchain technology is limited due to the unconsciousness of the Cryptocurrency value. In a situation where the banking economy may collapse, Crypto-Currency is the only viable option. The system can be extended to a global environment. The government can build their own digital currency formanaging all the transactions which will ultimately build trust among peoples by eliminating corruption and providing full transparency.Ahigh level of clarity and social accountability can calm donorminds and encourage them to donate while also strengtheningthe reputation of giving generously.

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