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Securing Charities Using Blockchain

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Abstract: ***While analyzing the problem we thought about the importance with respect to data security. Since everything is getting digitalized, security is the key point in this digital era. So, when it comes to data security or data integrity, there are serval ways through which we can achieve this. So, we started finding loop holes in digitize donation system. As this way we came on the conclusion that there are loop holes in the charity system. Hence, we have decided to use the most spectacular data security related technology i.e., "blockchain". We are implemented blockchain technology in this proposed system, so that whatever transaction / donation done between donor and beneficiary will be transparent and open to world. which will ultimately reduce chances of corruptions usually happen in the donation system.***

I. INTRODUCTION

Charity is a critical part of a democratic society. It is known that there are many incidents take place in this world which causes tragic loss whether it can be related to wealth or life and cause extensive damage every year. To recover from various types of losses many require help from organizations who providing services which can be financial aid to basic necessities. People are now becoming gluttonous to contribute to the society. So, Charity is a highly growing sector in today's world and it has evolved from its traditional organizational concepts to a decentralized crypto-currency based system.

The traditional system suffers from various problems such as lack of transparency, lack of trust between donors and corruption. Blockchain is a remarkably transparent and decentralized way of maintaining this kind of different charity-based transactions. So, we are going to propose a blockchain based decentralized system that acts as a platform to donate money for donors to beneficiaries and this entire system taking place under maximum security and fulfilled trust. Fake charities try to take advantage of our generosity and compassion for others in need. Scammers will steal your money by acting as a genuine charity. These scams not only cost you money but they also divert much needed donations away from legitimate charities and causes. Following statistics will state the broader view about this crisis related to frauds in charity.

The charity system mode proposed the use of blockchain technology to solve problems in social emergency assistance also analyzed the application of blockchain technology in India's philanthropy. and affirmed the advantages of blockchain technology in philanthropy.

The blockchain system can bring transparency to online charity trusts. Contributors can see the journey of the donation in real time and confirm if it's reaching the deserving hands or not. With the addition of blockchain into charities, donors would no longer be unaware of what's being done with their money. donation information would be stored in blocks. Each data block contains the hash code of a previous block and their own hash. This hash is generating for each new transaction. Hash is nothing but the string of numbers and letters. And suppose if we make a small change in the transaction, a new hash is generated immediately. So that we can immediately understand that something went wrong or someone tries to malpractice. Like this blockchain technology works.

II. LITERATURE REVIEW

Research on Charity System Based on Blockchain. Hangzhou Institute of Service Engineering, Hangzhou Normal University, Hangzhou, author- hubaokun (2020). The charity organizations in India having lack of transparency. and supervision to them is difficult to achieve, which has a negative impact on the willingness of the people to donate. Blockchain as an underlying technology of Bitcoin system provides a new solution for the charity system in terms of technology. This paper proposed a charity system based on blockchain technology and expounds the design pattern, architecture and operational process of the platform. Some core functions of the charity platform have been realized and verified on Ethereum. We hope to increase the transparency of charities to enhance the people trust in charities and promote the development of philanthropy by blockchain-based charity system.

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Research on Bitcoin: A Peer-to-Peer Electronic Cash System. Author: Satoshi Nakamoto (2008). Before implementing blockchain into our project, we first need to understand how blockchain works, how it is implemented onto the network. A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial organization. This paper proposed a peer-to-peer electronic cash transaction through blockchain. Which we will be using in our respected project for the transaction purpose. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work.

III. PROPOSED SYSTEM

This proposed system builds such a platform where all the people who genuinely wants to donate for a good cause and wants to help the needy, they able to do here through this website with all their trust. And they able to get or see the track record of transaction. And also, the people who need help should able to fill the information on the form provided by charity organization for review. And approved projects will be post on the charity platform. Organization gets donations from donor and transfer them to the campaign donor select for a donation.

IV. MODULE AND THEIR FUNCTIONALITIES

A. *Modules*

1) *Donor*: In this module, user can register in our system as a donor using credentials and unique wallet address. Only after admin verifies the donor account, he can view the campaigns and their details. And after selecting project for donation, he/she proceed for donation. For the donation purpose donor will request for our custom build token i.e., MOSS. The value for each MOSS is pre-defined in the code of smart contract. That value will never change. Suppose that 1MOSS = 2 Rupees, then if donor want 1000 MOSS, he has to pay 2000 Indian Rupees. When donor will upload his/ her transaction's screen-shot then only system will cross verify the transaction request made by the donor for the tokens. If this gets successful then admin will issue the respected no of tokens to the donor's wallet address. After that the system will check the balance of donor's account. Donation can be complete if balance is sufficient.
2) *Beneficiary:* In this module, user can register in system as a beneficiary using credentials and unique wallet address. After registration, admin will look for the beneficiary registration request. And do the KYC. Here admin will do the KYC for the cross-verification purpose. Once the KYC is done then only beneficiary can access the system and can-do further things such as creating campaigns etc. beneficiary can create campaigns with their details such as images, goals, required amount, duration. beneficiary can view all transactions related to campaigns. Beneficiary can get report of their own campaigns in which he/she will get information related to donated amount and their information. The key point here is that one beneficiary can only make one campaign at a time. This is done to avoid the confliction of wallet addresses.
3) *Admin***:** This is the most important and essential module of the entire project. Because this is the module in which donor can be verified, beneficiary can be verified, campaigns can be approved, tokens can be issued. Admin can also do the KYC for the donor as well as beneficiary. The most important thing of entire project is our MOSS tokens. Admin can issue these tokens to the donor.
4) *MetaMask***:** Metamask is a wallet that exists solely on your computer and gives you full control of your funds. Metamask is a crypto wallet- it allows you to store and transact Ethereum or any other Ethereum-based (ERC- 20) tokens. You do not register it on a website, but rather install it as an extension to your Chrome or Firefox browser. Since September 2020, it has also been available to install on a mobile app for Android and iPhone. Metamask stores your private key locally on your computer, within the browser data in particular. This is a huge step up in security terms but it is still conceivable that somebody might hack your PC and get the key. Perhaps the only safer options would be hardware wallets like Ledger or paper stored wallets, which are less convenient for frequent use. Indeed, it is possible to connect Metamask to hardware wallets like Trezor and Ledger. This is an ultimate combo – 100% security combined with Metamask's functionality. In short, Metamask is a smarter wallet choice. Here in our project, we have used MetaMask for the same purpose that is for making transactions. Donor as well as beneficiary will make wallet on MetaMask and will give its wallet address to the system. Then the respected system will fetch all the details with respect to that wallet address and do further transactions.

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5) *Blockchain Node/ Smart Contract:* Blockchain nodes are network stakeholders and their devices that are authorized to keep track of the distributed ledger and serve as communication hubs for various network tasks. A blockchain node's primary job is to confirm the legality of each subsequent batch of network transactions, known as blocks. In addition, allocating a unique identifier to each node in the network helps to distinguish a node from other nodes in the network easily. We have developed our own blockchain network by using the concept called as smart contracts. Smart contracts are smart because they are far more functional than their inanimate paper-based ancestors. No use of artificial intelligence is implied. A smart contract is a set of promises specified in digital form, including protocols within which the parties perform on these promises. These contracts are written in on programming language that is Solidity. We have used the same programming language in our project. Codes or more specifically we can say functions which we are going to use in our smart contracts are already predefined in the solidity, we just have to modify them according to our need. In our smart contract we have taken the parameters such as sender's address, receiver's address, amount etc. according to these parameters our transaction happens. Also, the tokens that we have made which is MOSS. That is also made in smart contract.

B. Functional requirements

1) *Peer-to-peer Network:* A peer-to-peer (P2P) network in which interconnected nodes("peers") share resources amongst each other without the use of a centralized administrative system. A network based on the client-server model, were individual clients request services and resources from centralized servers. Peer-to peer computing networking is a distributed application architecture that partitions tasks or workloads between peers. Peers are equally privileged, equipotent participants in the application. They are said to form a peer-to-peer network of nodes.
2) *SHA-256 Algorithm:* SHA-256 is one of the successor hash functions to SHA-1 and is one of the strongest hash functions available.SHA-256 is not much complex to code than SHA-1 and has not yet been compromised in any way. It generates an almost-unique 256-bit (32-byte) signature for a text.
3) *Digital Signature:* A digital signature (DS) is the detail of an electronic document that is used to identify the person transmitting the data.DS makes it possible to ascertain the non-distortion status of the information in a document once signed and to check whether or not the signature belongs to the key certificate holder. DS is treated as substitute for handwritten signature to the extent permitted by law. DS are quite similar to the actual signatures on a document. Digital signatures are backbone of bitcoin and every transaction has a different digital signature that depends on the private key of the user.
4) *Meta Mask Wallet:* Cryptocurrency wallet simply stores the information about the cryptocurrency. Cryptocurrencies only exists on huge database called as ledgers. These ledgers are a record of all the cryptocurrency transactions ever made. The most popular kind of cryptocurrency ledger is called a blockchain. Meta-Mask is a cryptocurrency wallet which can be used on 8 the Chrome, Firefox and Brave browsers. It's also a browser extension. This means that it works like a bridge between normal browsers and the Ethereum blockchain. The Ethereum blockchain is a network where users can build their own apps (which are called dApps) and cryptocurrencies.
5) *ERC20 Token:* One of the most significant Ethereum tokens is known as ERC-20. ERC-20 has emerged as the technical standard; it is used for all smart contracts on the Ethereum blockchain for token implementation and provides a list of rules that all Ethereum-based tokens must follow. ERC20 tokens are blockchain-based assets that have value and can be sent and received. The primary difference is that instead of running on their own blockchain, ERC-20 tokens are issued on the Ethereum network.
6) *Infura Node:* Infura is a blockchain development suite that provides application programming interfaces (APIs) and developer tools. Moreover, Infura provides fast and reliable access to the Ethereum network to enable developers to build sophisticated next-generation software and Web3 applications that scale to meet user demand. Furthermore, as an Infrastructure-as-a Service (Iaas) and Web3 backend infrastructure provider, Infura offers top-of-the-range documentation and resources to help developers build decentralized applications (dApps) quickly. This is achieved by reducing the time spent building infrastructure from scratch. Infura offers enterprise-ready infrastructure using a distributed cloud-hosted network of nodes. This removes much of the friction associated with the development and ownership of proprietary computing and storage facilities.

V. SYSTEM ARCHITECTURE

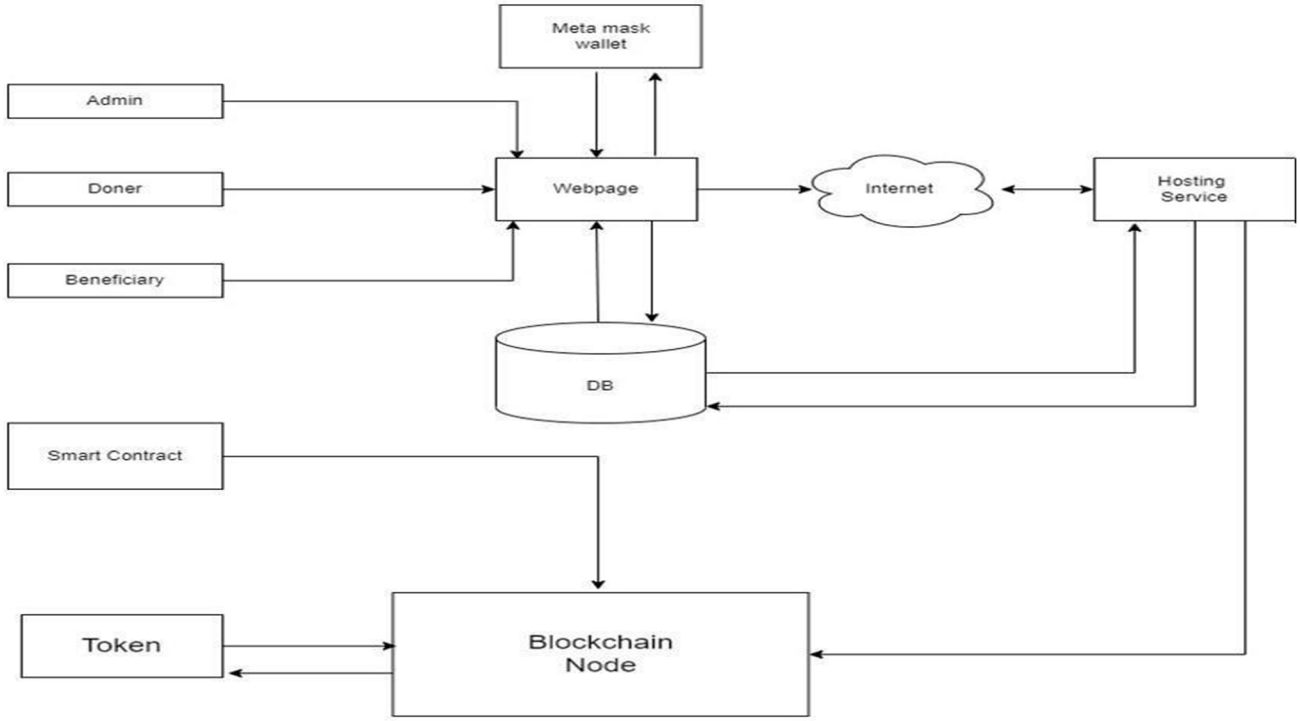


Fig.1. System Architecture

VI. APPLICATIONS

1) With the addition of blockchain into charities, donors would no longer be unaware of what's being done with their money. Donation information would be stored in blocks along with donor information.
2) Since blockchain is a public ledger that is viewable by anyone, charity fraud would be very difficult to commit; donors are able to carefully monitor their funds and ensure that no data is tampered with.
3) Blockchain technology can help charities manage their funds more closely and serve as a marketing strategy, removing the need for these middlemen.
4) Smart contracts are applications that run on blockchain technology that have rules and conditions programmed into them and initiate certain events when these conditions are met. In the case of philanthropy, these contracts can represent agreements between the giver and the charitable organization. This brings a lot of opportunities for all the parties involved in the donation process and can make it fully automated and uncompromising.
5) charities can accept payments securely, transparently, and globally without the need to pay currency exchange fees.

VII. CONCLUSION

We have proposed a system using Blockchain along with cryptocurrency for charity work to make it more transparent through a decentralized system. In today's date people are more concerned about others and this has made a lot of people benevolent. But at the same time many fake charity organizations and random people pose as genuine and loot money from innocent people in the name of charity. Those people want to ultimately make illegal money in the process. This system will provide both the requirements which are better authenticity and security. Also, it will provide the trusted system and will make the entire process more transparent. This will help to get donors and beneficiary without taking middle man in between, Because the system does not rely on an intermediary to transfer funds. The scope of the Blockchain technology is limited due to the unawareness of value of Cryptocurrency. In a scenario where the banking economy can be collapsed, Crypto-Currency will be the only viable option. System can be expanded at global environment. The philanthropic model could be applied in different situations e.g., when smartphones, laptops and Internet connectivity are unavailable. The decentralized structure especially the open source blockchain platforms prove problematic due to the challenges involved in ensuring these updates are installed at each node.

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VIII. FUTURE SCOPE

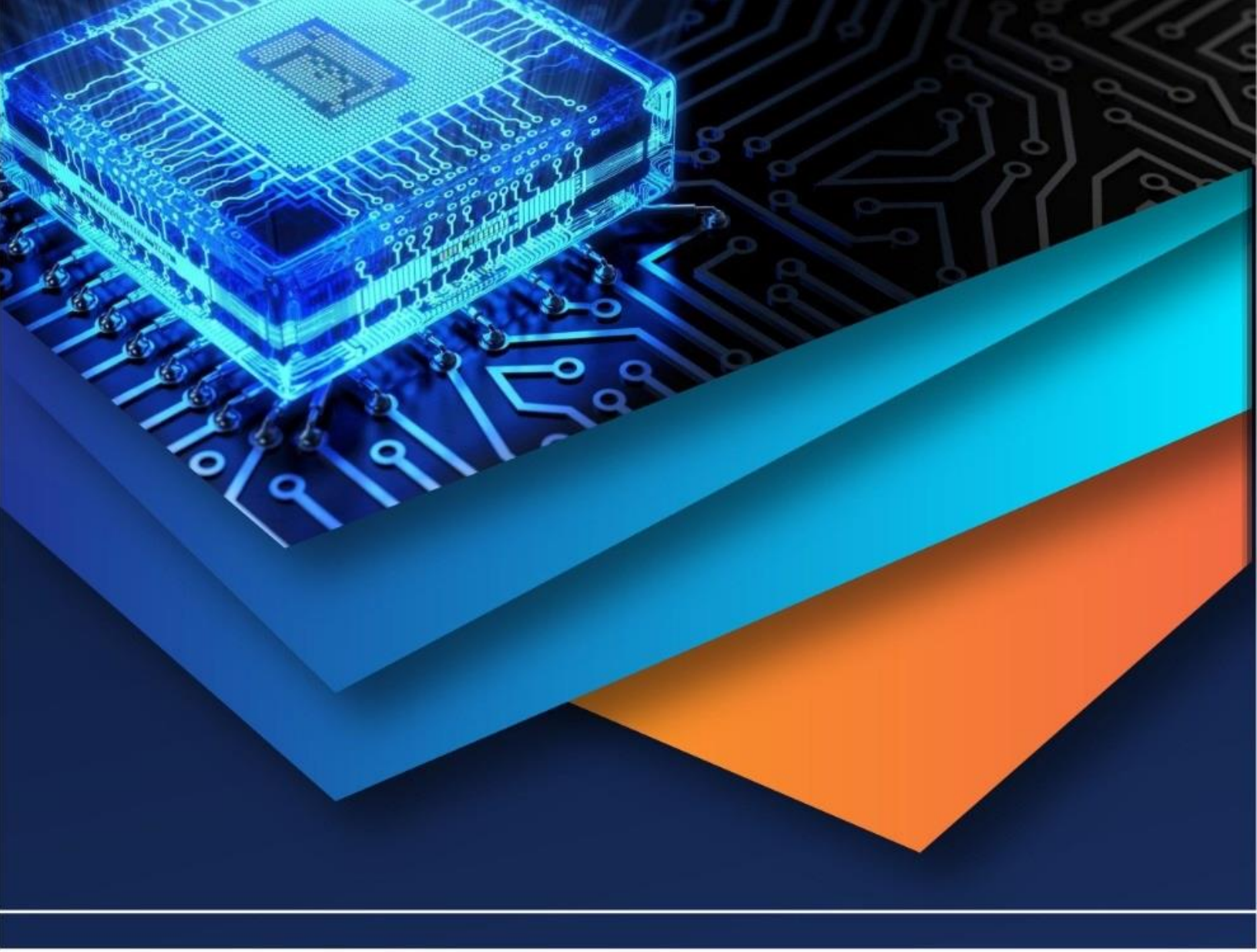
Blockchain technology has a great future worldwide. An incredible scope of blockchain technology has been observed in the financial field. Blockchain technology helps charities to become more transparent. In the future, we may see accountability for the spending of donations tied to smart contracts, enabling donors to donate directly to those best in a position to help.

IX. ACKNOWLEDGENENT

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