Trust-Aid (Blockchain-based Charity system)

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Abstract - *The charity organizations in India lack transparency and supervising them is difficult, which has a negative impact on the willingness of the people to donate. There exist many online donation platforms in the world and yet issues concerning extra fees, accountability, and processing delay are still a hurdle. Apart from this, it is also very costly for charities to transfer funds and operate in countries that need developmental aid. The proposed system is a decentralized authentic platform that aims to leverage blockchain along with other technologies to design a trusted framework that would enable charity donations to be accountable, trustworthy, and transparent. The project explores the potential for deploying blockchain within existing systems to support the smooth conduction of charity funds from the donor to the actual beneficiary using a stable Ethereum based Blockchain oriented platform. The proposed system explores how the blockchain can be leveraged in the philanthropic sector, through charitable donation services via a web-based donor platform. We hope to increase the transparency of charities to enhance the public's trust in charities and promote the development of philanthropy by a blockchain-based charity system.*

Key Words: Blockchain

I.INTRODUCTION

According to a McAfee report from 2019 {News}, 60.7% of people have been scammed by fraudulent charities. Scammers pose as legitimate organizations and beg for donations. Fake charities have expanded tenfold during this pandemic, and several examples of charity fraud have been reported. Therefore, the charity sector in many parts of the world is increasingly turning toward digitization and technological solutions, with the goal of improving the efficiency and transparency of the charity system.

In today's ever-changing globe, charity is an important aspect of a democratic society. Every year, a number of incidents occur around the world that result in catastrophic loss, whether it is related to fortune or life, and create significant harm. During these tragic times, any type of aid or support is desperately needed and appreciated, which is where charities come in. However, the traditional system is plagued by issues such as lack of transparency, donor distrust, and corruption. Fake charities attempt to profit from people's kindness and compassion for those in need. These scams not only cheat the donor but also divert much-needed donations away from legitimate charities and causes. In this proposed paper we present an interesting application of blockchain to construct a trustworthy framework for the charity sector called Trust-Aid.

To solve the above-mentioned problems there is the utmost need for a strong automated system for maintaining the transactions to assure that the funds reach the beneficiaries and provide reliability during the entire transaction process.

II. Study of the Systems

A. Literature Survey

1. Smart Contract

A smart contract is a self-executing contract with the terms of the agreement between different users being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network. The code controls the execution and transactions are trackable and irreversible.

Smart contracts permit trusted transactions and agreements to be carried out among disparate, anonymous parties without the need for a central authority, legal system, or external enforcement mechanism.

2. Blockchain

Blockchain technology is very suitable for solving the above problems because of its decentralization, openness, and security. Blockchain is a technology that collectively maintains a reliable distributed database through the trust of all members. Its core includes distributed ledger technology, asymmetric encryption algorithms, and smart contracts. It has the characteristics of decentralization, consensus mechanism, traceability, and high trust.

Decentralization is the most prominent and essential feature of blockchain. It does not rely on any additional third-party management or hardware and there is no central control. As long as there is no control over 51\% of all data nodes, nobody can modify the network or the data, which makes the blockchain relatively safe, avoiding subjective human data changes.

B. Related Work

1)Blockchain-based Trusted Charity Fund-Raising:

Aksel Reiten et al. [2016] presented a distributed, verifiable, and transparent system that uses blockchain technology to achieve these goals. As a result, the system takes advantage of recent advances in cryptography to design and build a transparent charitable micro-lending platform.

2)Philanthropy on the Blockchain:

Danushka Jayasinghe et al. [2012] proposed a study article that summarizes how blockchain might be used in the philanthropic sector, specifically through charitable giving. Web-based contribution services in fiat currency or Bitcoin platform for donors. An SMS can be sent utilizing the existing GSM network. Provisioning is recommended using a mobile payment mechanism that is based on the location of the donations that have been received.

3)Decentralized and financial approach to effective charity:

Pratyush Agarwal et, al [2018] have proposed a system that is supported by cryptocurrency transactions that may be used to make the charity system more transparent and trustworthy, where individuals or organizations perform charity (in the form of work) first and then offer that work as stock later.

4)Vishrambh: Trusted philanthropy with end-to-end transparency:

Apurv Mehra et.al [2018] Vishrambh is a platform that aims to use blockchain and other technologies to create a trustworthy framework that makes charitable donations as accountable and transparent as direct charity donations.

5) Insurance Technologies (Insurtech): Blockchain and its possible impact on turkish Insurance sector

Ismail Yildirim and Eyyup Ensari Sahin [2018] proposed a study paper to summarise the insurance business and blockchain application may appear to be incompatible. According to the research paper, blockchain technology would increase efficiency and allow for improved policy pricing and risk management in insurance procedures. It will become a better insurance compensation experience, which will boost the sector's trust factor.

III. Proposed System

The proposed system would consist of a web application named Trust-aid designed for mainly the following types of user's i.e. Donors and Beneficiaries. The Donors can register themselves, view different projects and donate for them as they wish. Whenever a new project is presented by the Beneficiary, it would be added to the smart contract. This provides a streamlined process for the users (Donors) to take care of the money they donated and track it on Trust-aid Blockchain-based Charity System whenever needed.

Our system uses blockchain technology to bring about transparency and can also help in significantly reducing a charity's administration and financing costs while also providing immutability, accountability, and security making it a potential tool for increasing public trust in charities, and we aim to support the development of philanthropy.
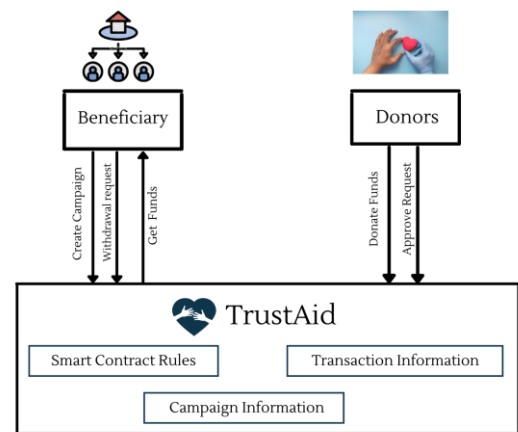

Fig. 1 . Proposed System

IV. System Design

Figure 2 is the block diagram for our charity platform based on blockchain. The beneficiary creates a campaign on the Trust-Aid platform. This project can now be viewed by the donor and if the donor is interested they can donate funds for the respective project. These funds are received in the metamask wallet as Ethers. Now, if the beneficiary wishes to receive the funds, a withdrawal request can be created. They request funds from the smart contract and in turn the smart

contract requests consensus from all the participating donors. If a positive consensus is received from half of the donors, the funds are immediately transferred to the beneficiary's account.
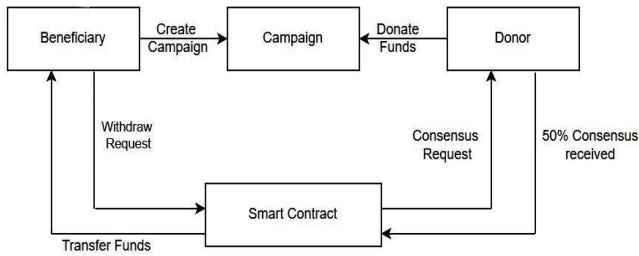
Fig. 2 . Block Diagram

Figure 3 portrays the control flow from the start point to the finish point. The users need to connect their MetaMask wallet in order to perform any transactions. The beneficiary creates a campaign that is uploaded on the Trust Aid platform. This project can now be viewed by the donor, who can then donate to it if they are interested. For donating the donor first enters the amount and the system checks the donor's wallet balance. If the entered amount is less than the wallet balance then the amount is successfully donated. Now, If the beneficiary desires to receive the funds collected so far, then they can initiate a withdrawal request in the smart contract, and in turn, the smart contract requests consensus from all the participating donors. If a positive consensus is received from at least half of the donors then funds are immediately transferred to the beneficiary's account else the request is discarded.
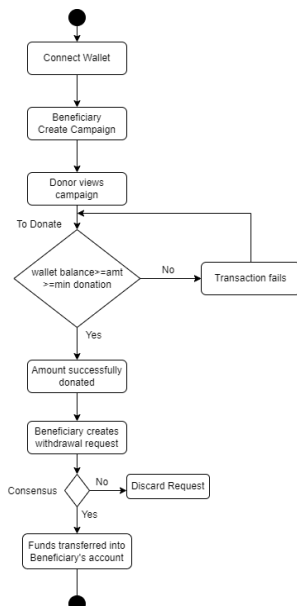
Fig. 3 . Activity Diagram

V. Implementation

We propose a Decentralized Application powered by Ethereum Blockchain, where all the information about campaigns, contributions, withdrawal requests, and funds are kept on a Blockchain Network, visible to all and decentralized. This means the funds and transactions are visible to and stored at every node on the blockchain, and prevent the data from being stored in a centralized server, a single location. Hence not letting the money get into the hands of anyone and eliminating the possibility of it getting misused — is an elegant and logical solution to the problem at hand.
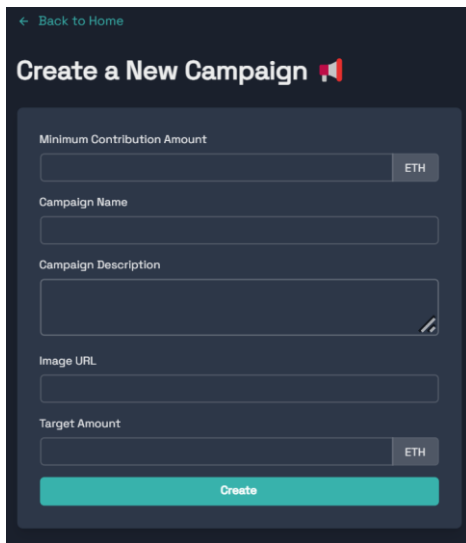
A) Connect wallet

In order to perform any transactions, be it the creation of a campaign or contributing to one, a user first needs to connect an Ethereum wallet to the site. We have made use of a browser extension called Metamask to connect the wallet, which can be used to authorize transactions for crypto currency.
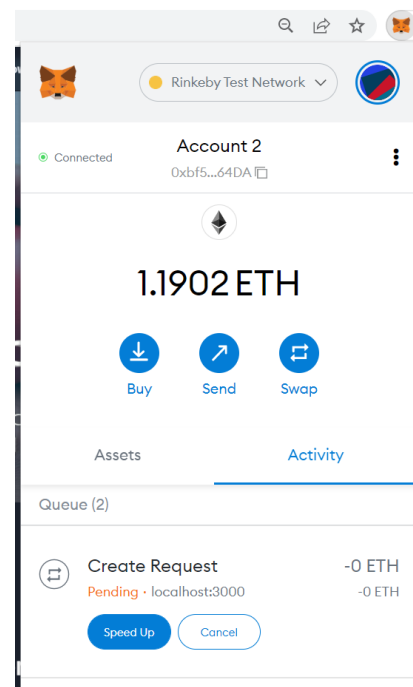
2) Creating a Campaign

On the TrustAid platform the beneficiary can create a campaign in a few minutes and the campaign information will be managed by the Ethereum-based smart contract and thus cannot be tampered with.

3) View Campaigns

Once a campaign has been created, it can be viewed on the home page along with other campaigns uploaded on the platform. The donor can go through them and donate to any of the desired campaign.
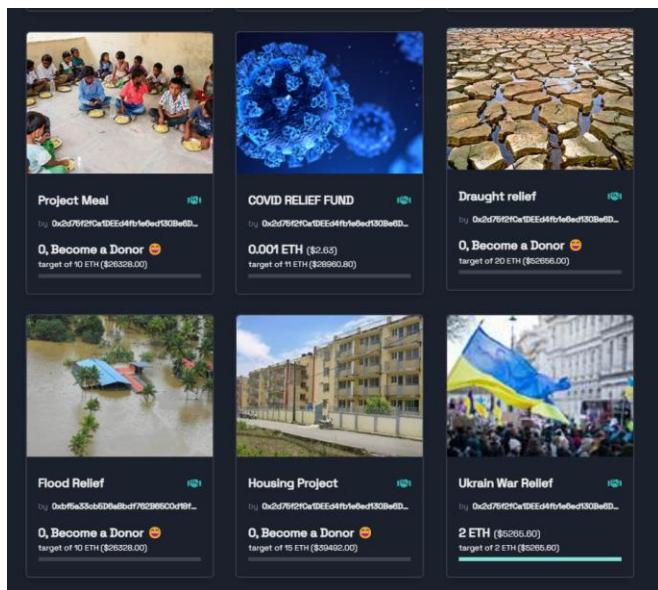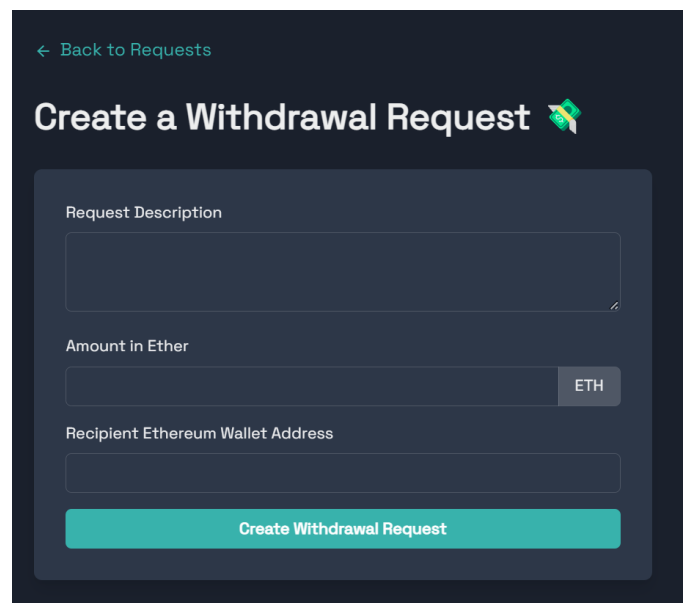

4) Contributing to a Campaign

Once a campaign has been created, users can share the campaign and anybody can donate to it. The funds will go to the contract address and not to the creator of the campaign, thus making the process more efficient and anti-fraudulent.

5) Withdrawal of Funds

The Creator of a Campaign can create a withdrawal request where they describe the use of the funds needed. This request reaches the approver (donors who have donated above a certain amount).

6) Approval of withdrawal request

Anybody who contributes more than a particular amount is called an approver, and will be able to approve or deny the request. Upon approval the funds are transferred to the campaign creators wallet from the contract address. Funds can't be withdrawn without the approval of 50% approvers.
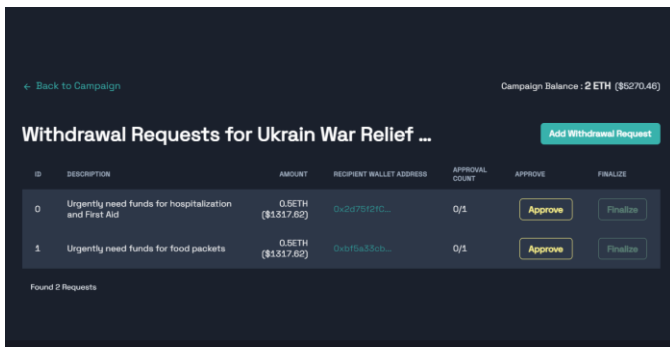
VI. CONCLUSIONS

In view of the current Charity system in India i.e lacking in transparency and information security, the problems related to fraud charity have become pain points and urgently need to be resolved. In this report, we proposed a completely new outlook to revolutionize the current Charity system using blockchain technology. Different terminologies related to blockchain have been analyzed. A comparative study of various technical papers related to our topic is also presented in this report. In order to understand our proposed system, we have added various UML diagrams and the system architecture of our proposed system have been depicted. Our proposed solution was implemented in order to develop an end-to-end robust and decentralized platform for a charity that provides a solution to the existing problems by providing transparency and immutability.

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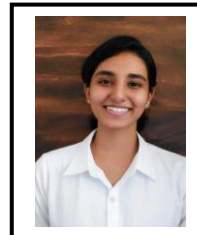
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