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Crystalline: A Blockchain based Donation System

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Abstract: ***Charity is an act of kindness, where people who financially capable are donate their money or assets to needy people or organizations that help people. Various unfair frauds and scams based on charity have been witnessed because of that, people who want to donate hesitate before donating their money. We will try to provide them with a more trustworthy and reliable environment for donation with transparency using blockchain technology. In the past two or three years, we all have seen the rise of cryptocurrencies like Bitcoin, Ethereum, etc, and other new things like NFTs, due to which awareness among people has increased about blockchain. People have shown their trust by adapting and implementing cryptocurrencies.***
Keywords: Blockchain, Ethereum, Cryptocurrency, Charity, Donation, Solidity,

I. INTRODUCTION

In recent years, India's charity exposed a variety of problems, which caused a trust crisis towards India's charity among the public, and further led to India's charity being once deadlocked. This paper designs a charity donation system by using a blockchain distributed ledger based on smart contracts made by using the Ethereum platform and software engineering method, aiming to use blockchain to get through the related links of charity donation, to improve the transparency and credibility of donation behaviour. Blockchain technology is a revolutionary technology based on an established and decentral system of blocks which are interconnected. It works upon the concept of decentralized distributed digital ledger. This technology enables cryptographically encrypted and hidden financial transactions among the users using this platform.
This system was created by a team of computer engineers and crypto enthusiasts using several technologies for both, the frontend design and backend support which will be mentioned later in this paper.

II. LITERATURE REVIEW

The technologies used for this paper have been previously researched upon for the betterment of the cryptocurrency and platforms related to the same. Some of their works have been reviewed and observed for further research.

A. Smart Contract: Attacks and Protections

Decentralized digital agreements can now be formed without the need of a third party, thus it has attracted a lot of attention from various industries. However, no matter how transparent it is, it is still vulnerable. The article discussed 10 security analysis tools which can help identify potential exploits. The accuracy was not perfect, and some vulnerabilities still slipped by. This concludes that, with time, as the potential of the platform rises, security issues will rise as well as it's resistance towards it.

B. Ethereum White Paper

Ethereum was originally brought out as a cryptocurrency working on blockchain whilst having more features like, withdrawal limits, and financial contracts etc, via a programming language. Ethereum does not directly support those applications but can be used in various methods to achieve so. Ethereum protocol provides countless possibilities to create various applications rather than having a single purpose.

C. SmartInspect: Solidity Smart Contract Inspector

The paper talked about the difficulties in inspecting solidity contracts and suggests using SmartInspect, which allows inspection of contracts on Ethereum platform. It allows user to see the contents of a contract using its source code without the need of redeploying it or unnecessary decoding.

D. Defining, Categorizing and Defending Against Online Fraud

There are many types of online scams/frauds, e.g., Loan scams, identity theft, credit card frauds etc. These crimes have existed ever since internet went public and over the years have grown to match the current technological pace.

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The article talks about SL (situated learning) which includes you getting an assessment of your situation and staying a step ahead of your fraudster. The article continues and discusses moral/ethical aspects and how it affects one economically and its impact on our society.

E. Is 'smart contract' really a smart idea?

The article made it clear that there are benefits as well as downfalls to the smart contracts being introduced into our daily lives. Advantages such as transparency, commercial efficiencies, anonymous transactions are followed by the unwillingness of governments and banks to accept it. There are various stigmas as well as rules, which smart contracts are not bound to, which leads them to be the subject of various debates.

III. WORKING

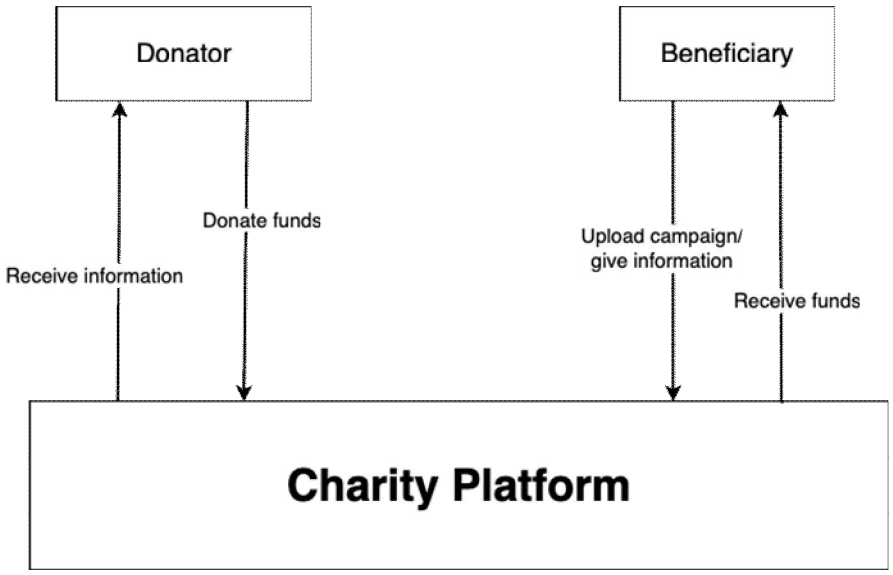


Fig. 1 The Design

The charity system mode proposed is shown in the Figure above. There are two roles: donors and beneficiaries (Donation charities). The beneficiaries verify their information and create charity projects through the platform. Donors learn about charity projects on the platform, then donate to beneficiaries (charity organizations). Beneficiaries upload their information to the platform for help, they link their wallets through Meta-Mask. The transactions occurred in the stores will be uploaded to the charity platform. The crypto can be exchanged for real money by charity organizations. The flow of funds has been fully recorded on the blockchain, which allows transactions to be tracked and funds prevented from being abused.

The application will be hosted online (web based). We specifically selected a web-based platform since we didn't want our project to be limited to a particular platform and be restricted to genuine charities.

The front-end part of this application has been created using JavaScript, React, Tailwind CSS and Vite Framework.

The back-end development is based on Block chain and Web3 technology. Smart contracts have been made using remix IDE, ThirdWeb framework for utilising the Web3 prospects.

The following technologies have been utilised for the development of 'Crystalline'.

1) Blockchains
2) Smart Contracts
a) Remix
b) ThirdWeb
c) Web3
3) Front-end Design
a) JavaScript
b) React

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c) Tailwind CSS
d) Vite Framework

IV. USE CASE DIAGRAMS

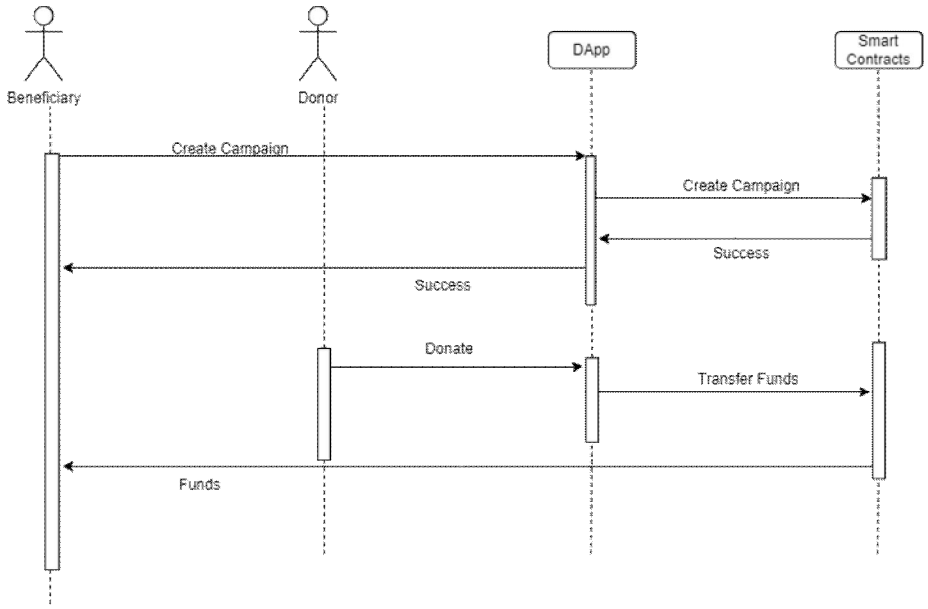


Fig. 2 DApp Model

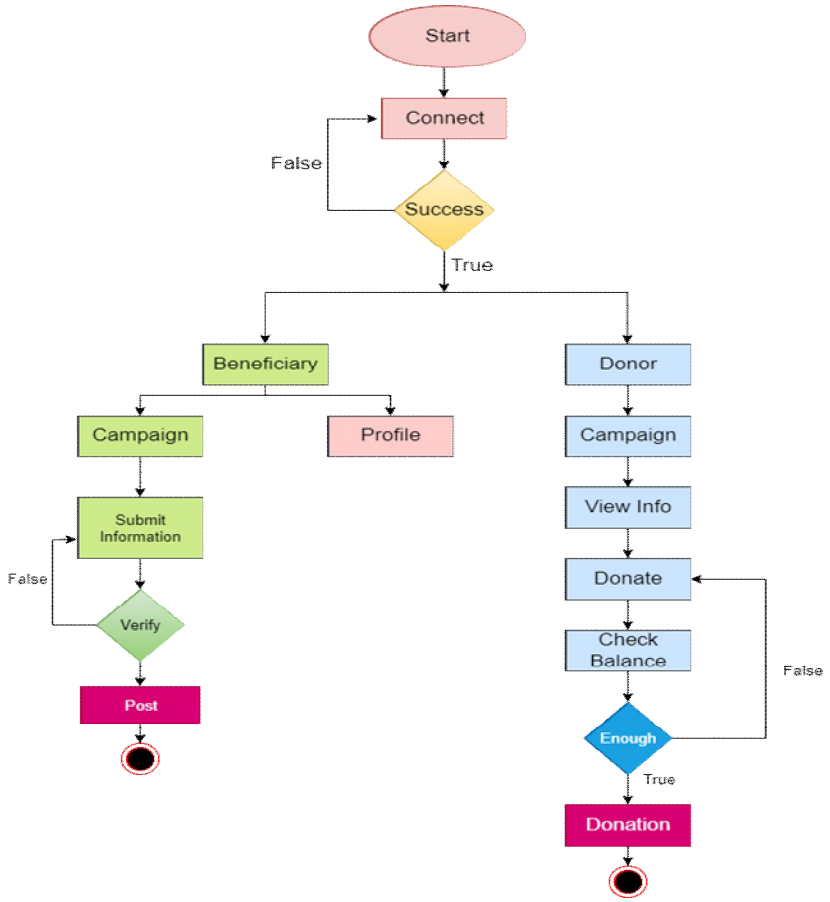


Fig. 3 Platform Usage Process

V. FUTURE SCOPE

Crystalline can be improved in the future by

1) Creating a better UI/UX
2) Work on more platforms (Android, iOS)
3) Getting Meta ready
4) Starting ETH mining to fund the project

As time and technology proceeds, smart contracts will basically be indulged in everyone's life, from paying electricity bills to shopping online. This theoretically guarantees that Crystalline's sole purpose as a charity donation could evolve into a multipurpose application.

VI. CONCLUSION

In this age of technology, we must harness every weapon possible to stand against the scams, frauds and corruptions that are obstacles for genuine charities. With Crystalline, we tried to provide an extra set of hands in this fight against such scams. With the help of crystalline, charities will now be able to verify their information and post campaigns and donors who are interested, can browse through the pages and select the campaign, with their linked meta-mask wallet, they can now donate any amount as per their liking, if their balance is enough, otherwise they will have to purchase the cryptocurrency through real money through meta-mask portal. Once an amount has been donated, a smart contract is formed immediately, which restricts changes made from either side. The hash codes are visible thoroughly to maintain transparency.

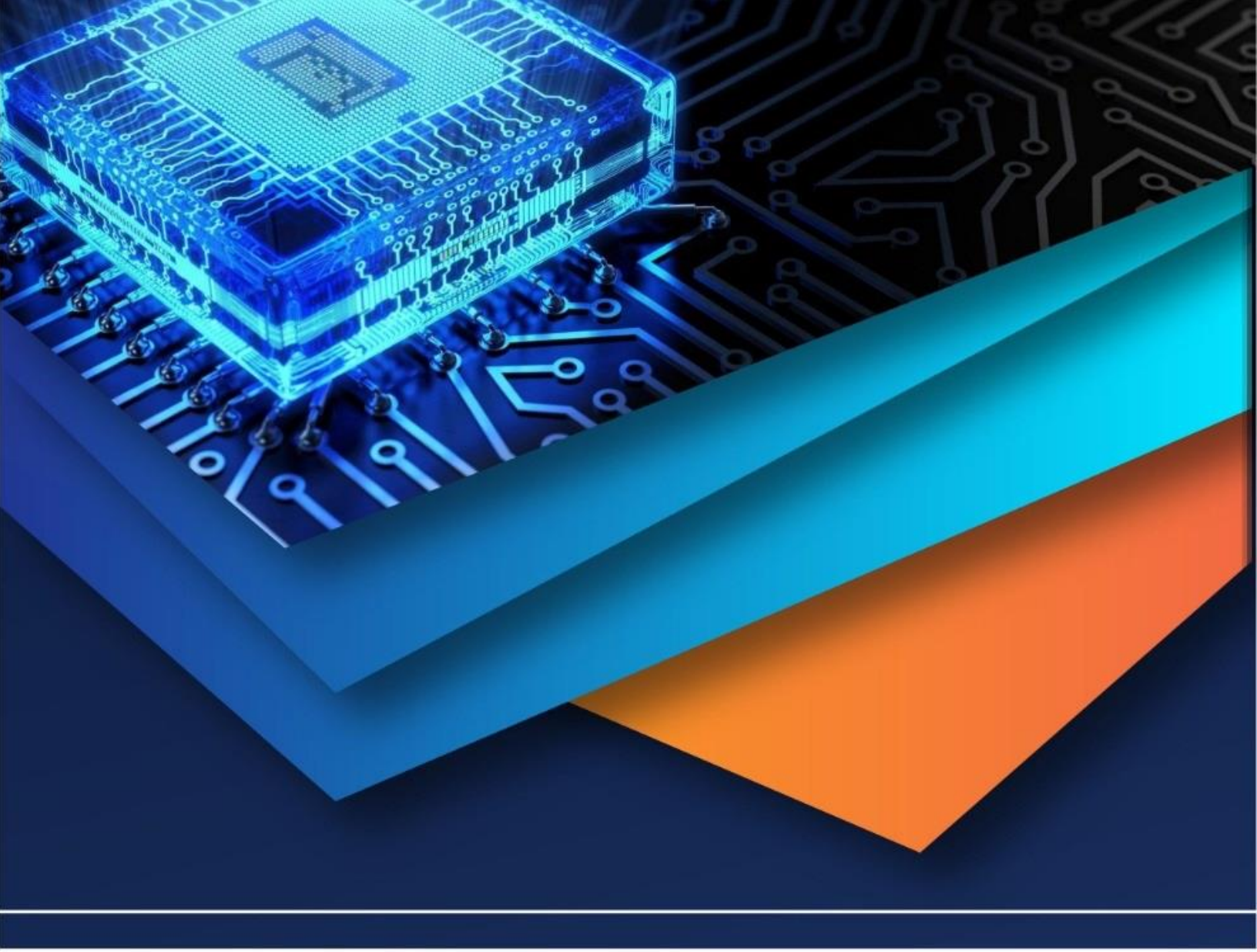
VII. ACKNOWLEDGMENT

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