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FundVerse: A Blockchain Based Crowdfunding DApp

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Abstract: Using modest sums of money from a large number of people to finance a new business endeavor is known as crowdfunding. It frees creators from depending only on conventional financing techniques by giving them access to funds from a network of supporters. With the aid of blockchain technology, it offers a platform for companies, entrepreneurs, non-governmental organizations, and regular people to organize online fundraising campaigns for any kind of cause—be it personal, business-related, or non-profit. Blockchain technology is revolutionizing the crowdfunding industry by enhancing security, flexibility, and transparency. Blockchain offers us a safe, secure, and decentralized environment. In this paper we introduce an enhanced version of Blockchain based crowdfunding platform for raising funds for path breaking projects and ideas. The main goal is to develop a Decentralized application based on smart contract that will enable investors to contribute to innovative ideas in a secure manner with a guarantee of the money.

IndexTerms **- Crowdfunding, Blockchain, Ethereum, Decentralized application, ThirdWeb, DAO, DApp.**

I. INTRODUCTION

Crowdfunding is a fundraising mechanism for new ventures and innovative projects. It is the practice of raising funds from a large number of people, often called backers, typically using online platforms. An interesting aspect of crowdfunding is that it gives non-professional investors (retail investors) access to early-stage investments. Before the raise of crowdfunding this investment, segment was reserved to professional (accredited) investors. Therefore, crowdfunding can be seen as a method to democratize the investment industry [2]. The traditional crowdfunding system has faced several challenges, particularly in regards to trust and security. Contributors often struggle to determine if a campaign is legitimate and there have been instances of fraud, unfulfilled conditions, and misused funds [1]. The "creators" of contents are supported by funders, who are entertained (or convinced) by their creations and motivated to participate to the donation [4]. On the other hand, blockchain technologies have changed radically the vision that we have of the Internet. More specifically, the blockchain has drastically evolved the way that we used to consider the finance, trust in communication and even renewed the concept of digital democracy [5]. Many of the concepts in the vision of hyper-connect and trusted world were already emerging as common ideas, but the blockchain has offered the tools for their fast realization, without requiring the presence of a third party. Thus, this technology allowed the fast growth of decentralized currencies, self-executing digital contracts (i.e. smart contracts) and intelligent assets that can be controlled over the Internet (i.e. smart property), reinforced also by the social impact it has had in society [3].

In this paper, we present FundVerse, a blockchain-based decentralized platform that combines social interactions with crowdfunding mechanisms, allowing any user to raise funds while becoming popular in the social network. Being built over the Ethereum blockchain, FundVerse is structured as a Decentralized Application (DApp), that fosters crowdfunding without the intervention of any central authority, and recognizes the active role of donors, enabling them to support artists or projects as well as humanity use cases.

II. RELATED WORK

Blockchain is a decentralized ledger that records network transactions securely and transparently hence contributors can determine how legitimate the campaign is? Leading to improved transparency and security. It offers improved flexibility, scalability and accessibility resulting in increased reach of campaign.

III. PROPOSED WORK

FundVerse is a Blockchain based zero downtime decentralized application that utilizes Ethereum smart contracts helping campaign creators to reach to the maximum number of donators, minimizing fraud and improve overall security. The immutability of Blockchain will lead to more smoother and transparent transactions resulting in improved trust on the crowdfunding process. Realtime tracking and monitoring of data will encourage people to donate to the campaign.Leaving the traditional crowdfunding methods behind FundVerse provides a intuitive dashboard with different sort of functionalities with the help of which campaign creators can create their own campaign with just few clicks.

The core features of the blockchain that acts as a backbone of this platform can be explained as below:

- **Immutability:** Immutability is defined as the ability of a blockchain ledger to remain unchanged, unaltered, and memorable. This ledger database is an append-only database hence cannot be changed or altered. It means that every entry is a permanent entry. Any new entry on it gets reflected on all copies of the databases hosted on different nodes.
- **Decentralized Network of Nodes:** Blockchain is decentralized that means there is no central authority of control. The decentralized nature of Blockchain allows the crowdfunding DApp to remove all the Intermediaries and third parties leading to maximize the withdrawal amount of the campaign. On the other hand, it also reduces a risk of single point of failure or application hacking.
- **Smart contracts:** A smart contract is a special type of account that has executable code and private states. It keeps track of all the details of agreement between buyer and seller in the form executable code. Smart contracts are having an ability to execute themselves automatically which reduces the probability of occurrence of fraud by automating the funding procedure.
- **Secured cryptography:** Cryptography assures confidentiality, data integrity and data authenticity leading to more secured transactions and preventing unauthorized access to the data.

All the features mentioned above makes blockchain DApps more transparent, more secured, flexible, scalable and accessible anywhere in the world. The traditional crowdfunding methods have many disadvantages which can be overcome using Blockchain DApp some of the main limitations are as mentioned below:

- **Centralized:** Traditional Crowdfunding methods involves Intermediaries and third parties leading to decreased withdrawal amount of the campaign. Most of the campaign are unable to get their funds as they are totally dependent on the central authority.
- **Tedious process:** In traditional crowdfunding method campaign creator has to follow all the policies of the central authority in order to get funded whereas due to many numbers of campaigns it is quite difficult for each campaign to get funded successfully.
- **High Fees Incurred:** As the traditional crowdfunding methods involves central authority hence the campaign creator has to pay some taxes from amount collected via campaign.

Crowdfunding on the blockchain is a relatively new phenomenon in the business world and a revolutionary way to raise money. It is similar to conventional crowdfunding, but it also has some unique characteristics. Consequently, the success criteria that impact the result of conventional crowdfunding might have a different impact on blockchain-powered crowdfunding. It's still unclear what the differences are between the success factors of blockchain-based crowdfunding campaigns and traditional crowdfunding, even though the number of these campaigns has increased significantly in recent years. Businesses require this information in order to properly plan their blockchain-based fundraising initiatives and facilitate potential investors' identification of the key performance indicators and motivators. It would also be advantageous for regulators and industry players to understand how blockchain-based crowdfunding fits into the current regulatory framework. Due to the unique features of blockchain-based crowdfunding, legal frameworks may need to be reinterpreted in order for laws to be implemented properly.

The proposed work involves the creation of a zero-downtime decentralized application for raising funds. For the frontend of this system, it uses ReactJs and for styling it utilizes Tailwind CSS. FundVerse allows the user to Create, Donate, Withdraw and Update the campaign seamlessly. The backend part of the application utilizes Solidity programming language on the basis of which the smart contract is build. On the other hand, it uses ThirdWeb and Hardhat to create and deploy the DApp on Sepolia testnet. The users of the proposed system are divided into two categories which are as follows:

- **Campaign Creator:** Creators are those users who creates the campaign.
- **Campaign Backers:** Campaign backers are oftenly called as campaign contributors who donate to the campaign.

In FundVerse there is no minimum contribution requirement that is the user can donate any amount to the campaign of their own choice without worrying about the minimum amount to be donated.

IV. Flow of Work

The root of the whole system is smart contract which is a self-executable code which runs on the Ethereum network. It gets automatically executed when certain conditions are met. The Ethereum blockchain uses proof of work (PoW) as consensus

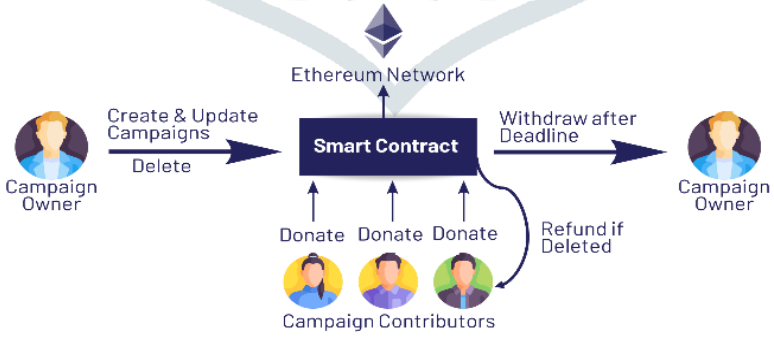

Fig. System Design

algorithm which helps to validate the transaction whereas PoW helps to keep track of all the transaction done over the network leading to improved transparency, integrity and security. The overall system design comprised of modules such as user authentication, campaign creation, campaign updation, campaign deletion, Refund to donators, Donate to campaign, Withdraw from campaign.

1. **User Authentication:** whether the user is backer or campaign creator both have to undergo through the process of user authentication which is done with the help of MetaMask, A popular third-party cryptocurrency wallet provider. Using MetaMask account user can create or donate to any campaign enabling seamless transactions.

2. **Campaign Creation:** Any user can create campaign of their desired category by utilizing this module which offers a simple and minimalistic form to create the campaign in just few clicks.
3. **Campaign Updation:** User who is the owner of the campaign can easily modify the content of the campaign using campaign updation module. Only owner of the campaign can modify the campaign ensuring campaign safety and security.
4. **Campaign Deletion:** The owner of the campaign can delete the campaign any time by using the campaign deletion module.
5. **Refund to Donators:** After deletion of the campaign the total amount collected got refunded to the users who contributed to the campaign if and only if there is no withdraw before deletion.
6. **Donate to Campaign:** The users who oftenly called as backers can donate to the campaign of their choice by utilizing Donate to campaign module.
7. **Withdraw from Campaign:** The owner of the campaign can withdraw the amount collected by the campaign by using this module.

Creating and contributing to campaigns in a transparent and safe manner is one of the functions of the proposed system. The Ethereum development environment controls system security, which is achieved by keeping track of all transactions and making the blockchain more difficult with each one to aid in the development of a strong system. Through the Hardhat Ethereum Environment, the Blockchain Environment is realized. MetaMask, an Ethereum wallet, is installed on a browser to enable browser-based access to an Ethereum wallet, but this is not how the Ethereum blockchain is connected. Writers of campaigns and contributors are provided with contracts composed in JavaScript and Solidity. Each transaction's blockchain records are accessible through the Etherscan website.

V. RESULT AND DISCUSSION

FundVerse provides an intuitive dashboard that lets campaign creators and donators to interact with campaign seamlessly. Dashboard consists of all the users' campaigns that are created and published by the campaign creators who were seeking funds for their various needs of different categories such Fundraiser, Environmental, Medical, Crisis Relief, etc.

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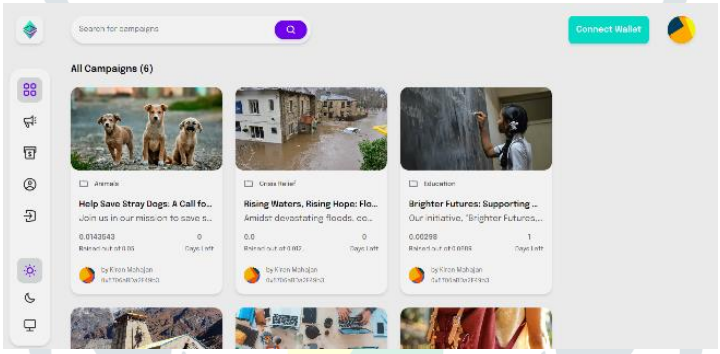

Fig 1. Dashboard

The connect wallet button at the top right corner of the dashboard offers seamless MetaMask integration for smooth transactions.

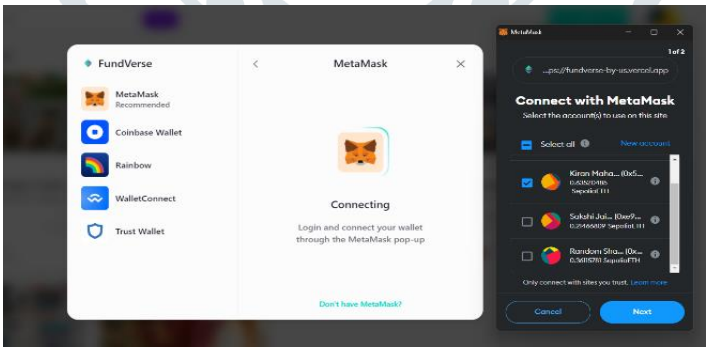

Fig 2. MetaMask wallet integration

FundVerse offers Intuitive campaign creation with essential details for user appeal. Campaign creators can describe their stories behind campaign creation and seek attention from majority of donators.

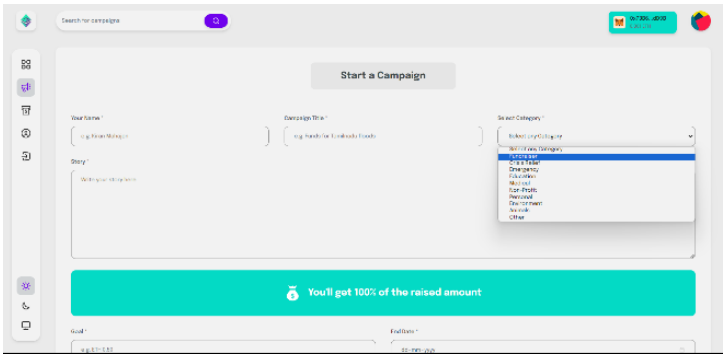

Fig 3. Create Campaign

It also offers effortless editing of campaign information for updates.

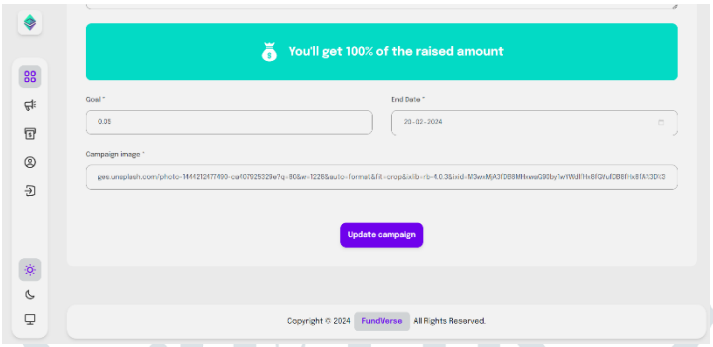

Fig 4. Update Campaign

FundVerse allows user to donate to any campaign of their choice without having any type of minimum contribution limits.

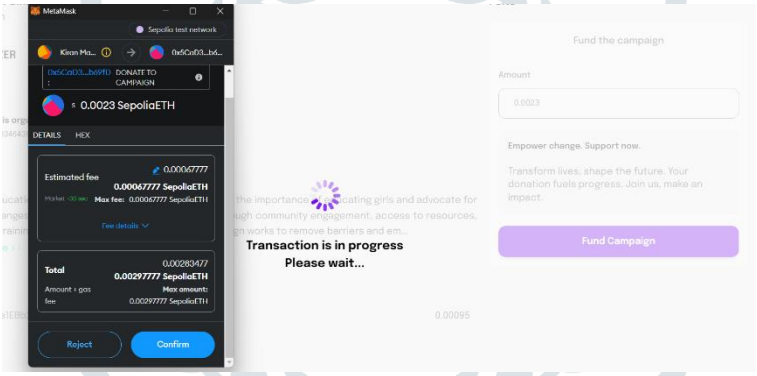

Fig 5. Donate to Campaign

On the other hand, the owner of the campaign can withdraw the total amount collected by the campaign itself till its deadline is reached.

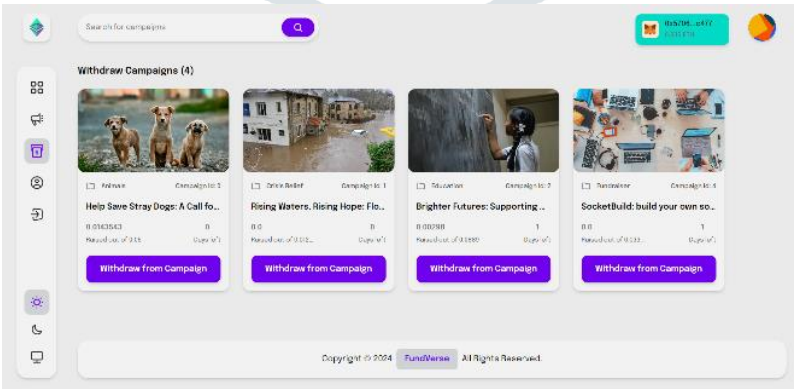

Fig 6. Withdraw from Campaign

Moreover, FundVerse provides Convenient campaign deletion functionality. Which lets campaign owner to delete the campaign completely from the DApp. After the successful deletion of the campaign the total amount collected by the campaign till date automatically get refunded to their respective campaign donators to their MetaMask wallet addresses.

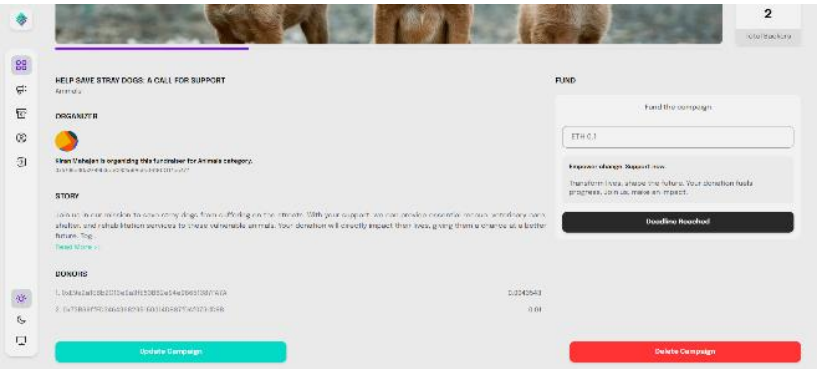

Fig 7. Delete Campaign

VI. Conclusion

The paper introduces an enhanced version of a blockchain-based crowdfunding platform that aims to raise funds for innovative ideas in a secure manner with a guarantee of the money.

FundVerse is a decentralized platform built over the Ethereum blockchain that combines social interactions with crowdfunding mechanisms. It allows any user to raise funds while becoming popular in the social network. The platform is structured as a Decentralized Application (DApp) and fosters crowdfunding without the intervention of any central authority. It recognizes the active role of donors, enabling them to support artists, projects, and humanity use cases. FundVerse provides an intuitive dashboard with various functionalities that allow campaign creators to easily create their own campaigns.

The use of blockchain technology in FundVerse enhances security, flexibility, and transparency. It offers a safe, secure, and decentralized environment for crowdfunding. The blockchain acts as a backbone for the platform, providing improved transparency, security, flexibility, scalability, and accessibility. This leads to an increased reach of campaigns and allows contributors to determine the legitimacy of a campaign.

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