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Research Paper

Blockchain-Based Crowd funding Platform

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Abstract: - *The value and sensitivity of people's data can be greatly altered by blockchain technology. Each transaction is logged and has a time and date stamp. Smart contracts even have the ability to automate transactions, which will increase efficiency and hasten the process even more. The transaction or process advances to the following stage when pre-specified requirements are satisfied. With smart contracts, there is no longer any need for human intervention or reliance on outside parties to confirm that the terms of the contract have been met. The intention to provide a trustworthy, secured, transparent, and decentralised solution is achieved by developing a blockchain-based crowd funding web application . Transparency and security are issues that are of utmost importance in any organisation, particularly in organizations that provide crowdfunding platforms. This crowdfunding application is not like other applications that only let users invest their money; in addition, this platform guarantees returns to backers.There will be three separate user kinds in this multi-user application: administrators, backers, and startup users or NGOs that can raise fund for a social cause. Startups get access to real-time information about the funding raised. Backers get access to both the general data about other projects mentioned on the application as well as the status of the projects they are sponsoring*

Keywords- *Blockchain, Crowdfunding, Smart Contract, Ethereum*

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1. Introduction

A particular kind of database is a blockchain. Blockchains store data in blocks that are subsequently linked together, which is different from how a traditional database stores data. As information is received, it is added to a new block. The block is chained onto the preceding block once it has been filled with data to create a chronological data chain. A blockchain can store many different types of data, but as of now, a transaction ledger has been the most widely used function. In this case, the blockchain is being used in a decentralised fashion, which means that all users collectively govern the system rather than a single person or group. The data entered on decentralised blockchains cannot be modified since they are immutable. Transactions are continuously recorded and publicly accessible in this application. Crowdfunding is a method of soliciting modest sums of money from a large number of people, typically online, to support a cause or enterprise. Crowd funding is a kind of alternative finance and crowdsourcing. This multi-user Blockchain-based crowdfunding tool enables different start- ups and NGOs to raise money from illustrious investors or donators who would be referred to as Backers. Startups have the ability to start a campaign with a story to seek interest from investors. This crowdfunding tool is unique in that it stores the funding in a smart contract rather than transferring it straight to the startup.

Blockchain-based smart contracts are computer programmes that execute when certain criteria are met. They are frequently used to automate contract execution so that all parties may instantly learn the

result, without requiring any middlemen or wasting time.

The body of the application is made up of the Start-up or NGO and Backer. An organisation can create projects and assign deadlines to them after creating an account. A Backer can browse several projects and decide whether or not to support them. A smart contract, which is a collection of rules that govern how transactions take place, stores the financed amount. Using HTTP, the web3 API enables communication with the Ethereum network. In essence, it enables MetaMask's connection with the application and gives MetaMask access to the smart contract and digital wallet for transaction processing. Due to the interface with the web3 A smart contract, which is a collection of rules that govern how transactions take place, stores the financed amount. Using HTTP, the web3 API enables communication with the Ethereum network. In essence, it enables MetaMask's connection with the application and gives MetaMask access to the smart contract and digital wallet for transaction processing. Due to the interface with the web3 API and MetaMask, all activities are reflected on the web application.

2. Related Work

Table 1 Related Work Area

Ref. No.	**Paper Details**	**Methodology Used**	**Proposed Idea**	**Advantages/ Achieved objectives in the paper**	**Disadvantages/ Limitations**
[1]	Ms. S. Benila, Ajay. V, Hrishikesh. K, Karthick. R. "Crowd Funding using Blockchain. " Global Research and Development Journal For Engineering 4.4 (2019): 19 -24.	The conclusions are based on the author's earlier paper.	The campaign producers will put their project ideas in the campaign, and the interested people will donate money to the project concept. This is known as a modular approach to crowd funding.	Gives campaign creators and contributors a safe, secure, and transparent crowd funding platform as well as interactive forms for campaign creation, donation, and request approval, enabling speedy development and support of initiatives.	Since the blockchain-based crowd funding application only displays a little prototype, it is difficult for everyone to comprehend the concept.
[2]	T. Dannberg, "Advantages and disadvantages with crowdfunding: - and who are the users?" Dissertation, 2017	Analysis of survey	Defining the features of crowd funding system consumers.	Different forms of crowdsourcing, system benefits and drawbacks, and user analysis.	The conclusions are based on the author's earlier paper.

[3]	M. Zichichi, M. Contu, S. Ferretti and G. D'Angelo, "LikeStarter: a Smartcontract based Social DAO for Crowdfunding," IEEE INFOCOM 2019 - IEEE Conference on Computer Communications Workshops(INFOCOM WKSHPS), 2019, pp. 313-318, doi:10.1109/INFCOMW.2019.8845133	Smart Contract of Ethereum platform, Decentralized Autonomous Organization (DAO)	Developed on the Ethereum blockchain, this social networking site allows users to donate money to other users by just "liking" them.	It combines interpersonal connections with the fundraising process, enabling any user to raise money while gaining more social media followers. Like Starter is a decentralized autonomous organization (DAO) built on the Ethereum blockchain that supports crowd funding without interference from a centralized power structure and honors contributors' active engagement by enabling them to profit from their support of artists or projects.	Because the system is solely based on likes, those with poor outreach are at a disadvantage.
[4]	Ashari, Firmansyah . (2020). Smart Contract and Blockchain for Crowdfundi ng Platform. Internationa l Journal of Advanced Trends in Computer Science and Engineerin g. 9. 3036- 3041. 10.30534/ijatcse/2020/83932020	Method of library research, Smart Contract	The procedure of verifying information provided by donors and recipients, eschewing the use of intermediaries (banks), and speeding up the submission and distribution of monies.	Due to blockchain, smart contracts not only increase confidence but also speed up the main fundraising process.	If a corporation decides to deploy a Smart Contract based on Blockchain technology with its own funds, it will incur a considerable expense. Smart contract service providers employ cryptocurrency, but not all governments regard it as legal tender.
[5]	Vikas Hassija, Vinay Chamola, Sherali Zeadally, BitFund: A blockchain- based crowd funding platform for future smart and connected nation, Sustainable Cities and Society, Volume 60, 2020, 102145, ISSN	Nash equilibrium	Bidding-based global crowdfunding platform	It has been proven that bidding requires much iteration to get an ideal result and is therefore superior to other generic algorithms.	Excessive standards and knowledge of the bidding process.

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[6]	Trupthi M, S. K. R. K. (2020). Crowdfundi ng Using Blockchain. Internationa l Journal of Advanced Science and Technology , 29(1), 932 - 945.	Web application using the Ethereum platform.	A smart contract-based solution that ensures the security of investor money and enables safe crowdsourcing	It is resistant to a range of hazards due to many benefits like improved dependability, quicker and more efficient operating, and user friendliness.	The vendor and the campaign author can work together to steal the contributions because the vendor's address isn't verified. Additionally, single donor can only contribute once from a single account to a campaign or startup at this time. Likewise, the Ethereumaccoun ts that the contributors are depositing money into are unverified.
[7]	Hasnan Baber, “Blockchai n-Based Crowdfunding A ‘Pay it Forward’ Model of WHIRL –2019” doi:10.35940/ijrte .C5398.098319	WHIRL Model	WHIRL is built on a pay-it forward economic paradigm that tries to establish a generous and giving positive feedback loop. Thanks to the"pay it forward" principle, anybody who launches acampaign has already madetheir dues. Because of thisidea, WHIRL differs from allother crowd funding platforms. Every other platform needs to raisemoney in order to honour itscommitments to its donors. They've already complied with their	The project contributors won't make any fictitious accounts to entice backers. The Pay-it- Forward strategy is based on atime-tested model in which small towns cooperate to raise funds for development, foreseeable needs, or mutualassistance in certain areas ofdaily life.	Those who follow the Payit Forward philosophy are only permitted to go camping after helping someone else with their project. Karma points, which must begathered before the campaign can start, are the premise on which it runs.

			commitments toassist other WHIRL-based projects.		

3. Existing System

3.1 Issues with the current system

The biggest issue with the centralized solution is a lack of trust, as they explicitly state on their websites that investors are not guaranteed rewards and that they are not liable for any money lost. After the project is successfully funded, the investors' money is not guaranteed. The centralized system also charges the fund raisers between 5% and 10%, and a portion of the commission must be given as payment costs to the platforms.

3.2 Lack of transparency

Donators who successfully support a campaign are in the dark about how the fund raiser will use their funds. The investors who funded the project have not been adequately disclosed. Some users built projects without a clear understanding of their intended usage. Since any user can launch a project without being verified, scammers frequently fabricate information about them, which causes investors to lose money.

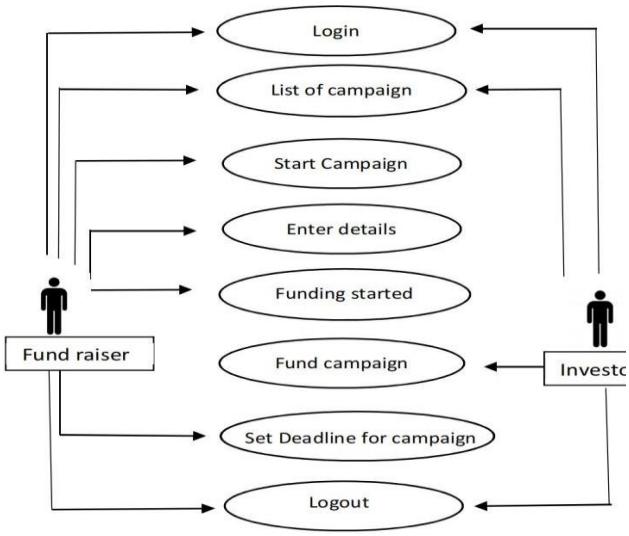
3.3 Poor Security

There is no assurance that users' personal information won't be compromised or disclosed, and there is no money security offered. Due to occurrences like this, which resulted in the exposure of consumer data on the well-known crowdfunding platform Kickstarter in February 2014, faith in centralised systems was significantly diminished. There have also been allegations that crowdfunding websites are being utilised as venues for money laundering, and as a result, users' trust has not been properly established.

4. Proposed System

When bitcoin was first introduced in 2009, people simply transferred bitcoin from one person to another using it as a means of transaction. Later, it is used in place of money to purchase some goods in the real world. As a result, they decided to use blockchain technology for more than just transactions. In 2015, Vitalik Buterin launched the Ethereum blockchain network, which allows users to write applications called smart contracts on top of transactions. As more and more businesses realized the potential of blockchain, they began to implement it. In the real world, smart contracts are similar to legal agreements, but they are digitalized, which is why they are also called digital agreements. It is made up of the business logic that is written in solidity, an object-oriented programming language. The inviolability of the smart contracts once they are published on the blockchain contributes to the development of trust among individuals. Because of this, they have begun utilizing the blockchain technology and have confidence in it. Our crowd funding platforms aim to provide users with a secure and dependable platform. It gives them confidence that their money won't be taken or used in a bad way. The smart contract system that handles all transactions and ensures the safe storage of necessary metadata accomplishes this. Any cryptocurrencies supported by the platform can be used to raise funds. We think that our platform will be a great way to connect creators and investors/donors and help solve a problem for a social cause.

Figure 1 System for Identity Verification



Donors can login to the web-app and view the list of campaigns that are currently live. They can view the details such as the creator, donors' id and story behind the campaign that they are interested in and donate in cryptocurrency.

Creators can create a campaign with a title, story, target amount and set deadlines for their campaign.

4.1 Using cryptocurrencies

Users can raise and donate funds using cryptocurrencies. The commission costs are absolutely free for any number of transactions.

4.2 Promoting openness

Our platform offers a specialized explorer through which users can learn more about the investors and the campaigns to which they have contributed. It is also possible to track the amount of money and projects raised by a particular user. so that investors and fundraisers can bond and trust one another. If a user is trying to raise money, that means they will share information about the project, their previous work, and the rewards they plan to give investors when the project is finished. Investors benefit greatly from this transparency in project analysis.

4.3 Security

Smart contracts will control all of the transactions that take place. The information cannot be edited by anyone but the smart contract's owner or administrator. When compared to centralized crowdfunding platforms, this instills a great deal of confidence in users.

4.4 Ethereum Network

Ethereum is a peer-to-peer blockchain platform for securely executing and verifying application code, or smart contracts. Participants in smart contracts can transact with one another without the need for a reliable central authority.

4.5 Advantages:

This programme is a decentralised, efficient, trustworthy, transparent, and secure platform for crowdfunding.This project aims to fix issues like the involvement of third parties on crowdfunding platforms, the lack of assurances regarding the success of projects funded through crowdfunding, the loss of invested funds, the uncertainty regarding returns to backers, and the lack of a trustworthy, secure, and open crowdfunding platform.

4.6 Future Scope:

The application's functioning prototype currently utilizes a local blockchain without the use of actual cryptocurrency. The programme can be made available to the general public as a future update by being put into use on a real blockchain. The programme can be applied to safe crowdsourcing. Innovative projects with market growth potential can receive funding from real investors. The young startups will gain from being able to display their goods on a reliable platform.

4.7 Technologies Used:

Back-end software

- Ganache
- Solidity (ProgrammingLanguage)

Framework

- ThirdWeb (Framework)
- Tailwind

Front-end software

- Next JS

Other software

- MetaMask (BrowserExtension)

5. Results

5.1 Objectives achieved

Our project gets rid of issues like:

- Third parties' participation in crowdfunding platforms.
- There are no assurances that crowdsourced projects will becompleted.
- Waste and improper utilisation of invested

funds.

- No guarantee of returns to backers.

6. Conclusion

6.1 Transparency

The tool upholds transparency between investors and startups, allowing investors to continuously monitor the development of the startup's initiative. Donators can donate in cryptocurrencies for any social cause like poverty or helthcare for the needy.

6.2. Reliability

To ensure that no additional funds are transmitted to the smart contract, the money will only be added up until the startup's demand is satisfied or the deadline that is fixed incase of NGOs. This programme also makes sure that the total amount of funding that backers can provide at one time is not greater than what the project as a whole requires.

6.3 Security

Although not impervious to attack, blockchain has a stronger line of protection because it is decentralised. To alter a distributed ledger, a hacker or criminal would need to have access to more than half of all the machines.

6.4 Interactive User Interface

This application's UI is user-friendly, and both backers and startups can find detailed instructions on how to use it on a special "Help" page. It also offers a link to a similar explanation in a video.

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