

CROWDFUNDING APPLICATION USING BLOCKCHAIN

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Abstract—The value and sensitivity of people's data can be greatly altered by blockchain technology. Every transaction is irrevocably logged and time- and date-stamped. 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 desire to provide a trustworthy, secured, transparent, and decentralized solution is achieved by developing a block chain-based crowd-funding web application. Transparency and security are issues that are of the utmost importance in any organization, especially those that provide crowd-funding platforms. This crowd-funding tool provides backers with the assurance that profits will be guaranteed, making it different from other applications that simply allow users to contribute their money. The application will also promote open communication between investors and start-ups so that investors can stay informed about how the projects of the various start-ups they funded are progressing. If the project is abandoned in the middle, the money will be returned to the backers.

Keywords—Blockchain, Crowdfunding, Smart Contract, EthereumAPI

I. INTRODUCTION

In order to provide the required financial support for small or early-stage American-based businesses, crowdsourcing concentrates the finances of small and medium-sized investors. The crowdfunding platform was developed in the internet era and is based on internet technology, which combines the internet, entrepreneurship, and investment. The online initiative was able to receive finance assistance and verification before being on sale thanks to crowd funding, which might satisfy college students' requirements for entrepreneurship. There are now numerous major issues with independent entrepreneurship among college students, including a lack of funding, a lack of managerial skills, and an unmanageable level of risk. Three different user types—Admin, Backers, and Start-up—will be included in this multi-user application. Start-ups can only be listed with admin approval. Startups get access to

real-time information about the approval status of their ideas and funding rose. 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.

A. Blockchain

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. For this application, it means that transactions are permanently recorded and viewable to anyone.

B. Crowdfunding

Crowd funding is a method of soliciting modest sums of money from a large number of people, typically online, to support a cause or initiative. Crowdfunding is a kind of alternative finance and crowdsourcing.

C. Smart Contract

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 promptly learn the result without the need for any middlemen or squandering time..

D. Ethereum

In 2015, Ethereum, a public blockchain framework, was introduced. Similar to Bitcoin, it uses a distributed digital ledger and has the cryptocurrency Ether (ETH). The consensus algorithm used by Ethereum at the moment is called Proof of Stake (POS).

II. PROPOSED SYSTEM

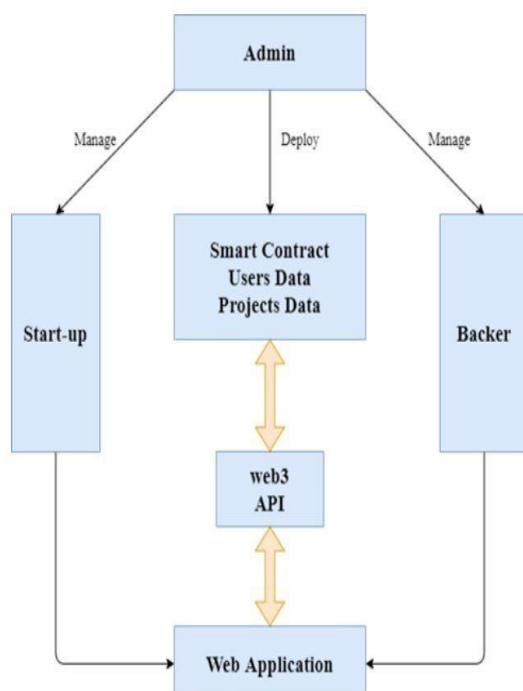


Fig. 1. Architecture Diagram

The figure above shows the basic architecture diagram of the application. The main component of the application is an Admin. The administrator can opt to accept or deny a project's listing on the application and can watch over Startup and Backer's activity without in any way controlling them. The body of the application is made up of the Start-up and Backer. An organisation can create projects and assign deadlines to them after creating an account. A Backer can browse various projects and decide whether or not to support them. A smart contract, which is a set of guidelines by which transactions take place, stores the funded amount. Using HTTP, the web3 API enables communication with the Ethereum platform. 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 website (the web application).

A. MetaMask

A cryptocurrency wallet called MetaMask links to many chains and supports a number of different cryptocurrencies [10]. Both desktop and mobile applications for Android and iOS have access to the MetaMask wallet as a browser plugin. To utilise the wallet on other platforms and for account recovery, the user must save their 12-word unique passphrase during the account creation process. Asymmetric cryptography is used to encrypt the MetaMask wallet, and the passphrase serves as a private key. The Ethereum Main network, different Ethereum Test networks including Rinkeby, Ropsten, Kovan, and Goerli, as well as local host chains and several additional unique remote procedure call (RPC) chains are all accessible to users.

III. METHODOLOGY

This application seeks to end the issue by employing a strategy that makes sure that funds are used effectively and that projects are completed. According to the proposed approach, the complete amount of funding wouldn't be given to the firm directly but would instead be kept in a smart contract. There are predetermined milestones that startups must reach. Therefore, the company will receive a payment every time a milestone is reached that is equal to a portion of the sum of all the milestones. The amount given to startups at various project stages is illustrated in the following: Suppose there are n total project milestones that need to be accomplished. The startup deducts $1/n$ times the entire amount kept in the memory when each milestone is finished. The startup will receive $1/n$ times the total money deposited in the smart contract after each milestone is accomplished by the startup. The startup will finally receive the full amount of funding deposited to their account in this manner. The programme will also promote open communication between investors and entrepreneurs, enabling investors to track the development of the projects for the various businesses in whom they have made financial investments. If the project is abandoned in the middle, the money will be returned to the backers. Depending on the various stages of the project, the payment will be repaid. Following illustrates the amount refunded to the backers on n different stages of the project:

Let the total milestones to be completed for the project be n .

- If no milestones have been completed yet and the project is aborted at this stage, then the whole amount that the backers funded is refunded to them immediately.
- If the milestone that is completed is m and the project is aborted at this stage, then the amount refunded to the backers will be $n-m/n$ times the total amount funded by that particular backer.

Hence, by adopting this method, it is ensured that the backers' funds are neither misused nor wasted.

A. Security

Because it is decentralised, which ensures that no one individual has control over all of the data passing through the blockchain, this programme offers a good measure of security. Numerous nodes make up a blockchain, and they all work together to store the data that is sent between them. Second, only the admin has the authority to approve a project before it is included in the application. As a result, this prevents money from being wasted and guarantees that genuine projects are visible to the backers. The admin can only decide whether a project can be listed on the application or not; they cannot access any other information.

This programme is a decentralized, 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.

B. Use of CBDC

Central bank digital currencies (CBDCs) could potentially be used for crowdfunding, although this would depend on how the CBDC is designed and implemented. One potential use case for CBDCs in crowdfunding is to enable peer-to-peer (P2P) crowdfunding platforms that operate without the need for a centralized intermediary. CBDCs could provide a more efficient and cost-effective way to transfer funds between backers and project creators, as they can be transferred quickly and securely without the need for intermediaries like banks or payment processors. In addition, CBDCs could potentially provide greater transparency and accountability in crowdfunding by allowing all transactions to be recorded on a public ledger. This could help to prevent fraud and increase trust between backers and project creators. However, there are also potential challenges and risks associated with using CBDCs for crowdfunding. For example, there may be concerns about the volatility of the CBDC's value and the potential for price fluctuations to impact crowdfunding campaigns. There may also be regulatory and legal issues to consider, such as how CBDCs would be treated under existing crowdfunding regulations. Overall, while CBDCs could offer benefits for crowdfunding, there are still many technical, legal, and policy issues that need to be addressed before they can be widely used for this purpose.

IV. CONCLUSION

A. Transparency

The tool upholds transparency between investors and startups, allowing investors to continuously monitor the development of the startup's initiative. The leftover funds in the smart contract are reimbursed to backers in the proper proportion based on how much they contributed if a business decides to leave a project at any time.

B. 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. Additionally, our programme makes sure that the total amount of funding that backers can provide at one time does not exceed the entire amount needed for the project..

C. 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..

D. 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.

E. Objectives to achieve

Our project will eliminate the problems such as:

- Involvement of third parties on crowdfunding platforms.
- No guarantees of completion of projects under crowdfunding.

- Wastage and misuse of invested money.
- No assurance of returns to the backers.

Upon achievement of the milestones, the programme makes sure that the monies are properly distributed from the smart contract to the startup's account. Additionally, it guarantees that in the event of a project cancellation, the smart contract's leftover money will be distributed to all stakeholders (i.e., backers) in the same proportion as they contributed to the startup's initial funding.

Future Scope

As a future upgrade, the programme can be pushed to production on an actual blockchain, enabling the general public to utilise it. The working prototype of the application will operate on a local blockchain that does not use real cryptocurrency. The programme can be applied to safe crowdsourcing. Innovative projects with market growth potential can receive funding from real investors. The ability to display their goods on a reliable platform and take advantage of numerous other features would be advantageous to emerging entrepreneurs as well.

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