



Crowdfunding on the Ethereum Blockchain

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CROWDFUNDING ON THE ETHEREUM BLOCKCHAIN

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Abstract—Crowdfunding is one of the most popular ways to raise funds for any project, cause or for helping any individual in need.

With the onset of Covid we have seen a rise in Crowdfunding activities across the globe which includes small campaigns to help people get oxygen and medical help to large funds such as PM Cares.

Keywords—*ethereum, crowdfunding, blockchain, smart contract*

I. INTRODUCTION

Crowdfunding is one of the most popular ways to raise funds for any project, cause or for helping any individual in need. With the onset of Covid we have seen a rise in Crowdfunding activities across the globe which includes small campaigns to help people get oxygen and medical help to large funds such as PM Cares.

The major problems with the Current Crowdfunding Platforms that we wanted to solve were :

Security : As the funds become larger, they need to be heavily secure, although stringent measures such as symmetric encryption are in place to make e-payment safe and secure, it is still vulnerable to hacking. Blockchain[1] — which has never been compromised yet — can provide that level of security.

Transparency and Anti-Fraud : We have seen, and continue to see a lot of crowdfunding scams happening around. There is no way to see where the funds are being used. We wanted to make the entire flow of funds transparent at every stage, so that there is no possibility of the money being misused.

Global contribution : With some of the platforms being country specific, it becomes hard for people from other countries to contribute to various campaigns. Using blockchain anyone in the world can contribute to the campaign. Transactions are quick and convenient.

We were highly inspired by the CryptoRelief initiative (www.cryptorelief.in)[2] which raised ~1 billion dollars for Covid Relief in India from the entire global community, in a highly transparent manner.

II. FEASIBILITY: TECHNICAL AND NON-TECHNICAL

Technical Feasibility

- It is to be a ReactJS based application, which will be supported by any web browser.
- Internet connectivity will be required.
- Users will require ‘Metamask’ browser extension to sign transactions.

Social Feasibility

- Crowdfunding over the years has helped people but has also seen heavy frauds in the name of Crowdfunding. With CryptoCrowdFund we want to bring transparency to the process of crowdfunding and build trust among people to contribute to all the causes.

Economic Feasibility

- Given the Ethereum Blockchain provides us with most of the security features, the development does not require much cost.
- The only cost would be the server cost of the deployed application.

Scope

- With CryptoCrowdFund we aim to make the crowdfunding process transparent, anti-fraudulent and secure.

III. PROPOSED SOLUTION

Identifying stakeholders

The stakeholders can be divided into two parts: **Campaign**

Creators : These are the users who have created a Campaign.

Contributors & Approvers : *Contributors* are the users who contribute and fund the campaigns. *Approvers* are Contributors who have contributed more than the Minimum Contribution, and they can approve the

withdrawal requests.

Detailed Solution

Any web based application is a centralized application which means that anything we do on the platform is managed by a server which is owned by a single company. 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 prevents the data from being stored in a centralized server, single location.

Hence not letting the money get into the hands of anyone and eliminating every possibility of it getting misused — an elegant and logical solution to the problem in hand.

The features are explained below :

1. **Creating a Campaign** : Just like Crowdfunding in the real world as well as on other crowdfunding platforms, anyone can create a campaign in a few minutes. The campaign information will be managed by the Ethereum-based smart contract and thus cannot be tampered with.

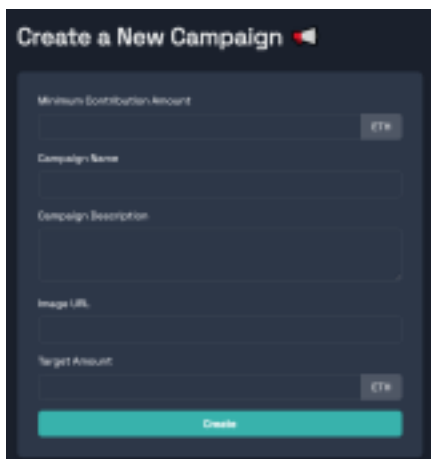


Fig 1: Form to create a campaign

2. **Contributing to a Campaign** : Once a campaign has been created, users can share the campaign and anybody can contribute to the campaign. **The funds will go to the address of the campaign and not to the creator of the campaign**, thus making the process more efficient and anti-fraudulent.

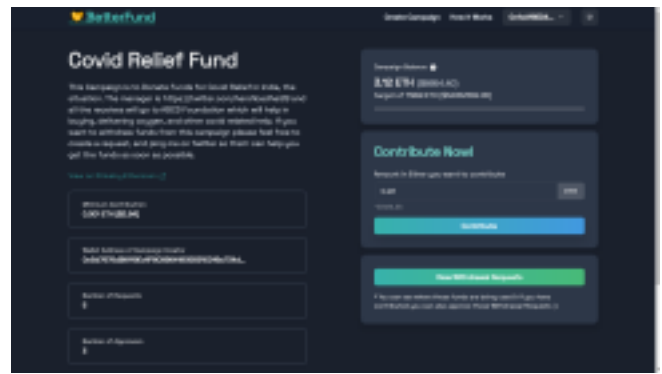


Fig 2: The “Contribute to a campaign” screen

3. **Withdrawal of Funds** : The Creator of a Campaign can propose how to use the funds in the form of a Withdrawal Request. Anybody who contributes more than a particular amount is called an approver, and will be able to approve or deny the request.

Funds can't be withdrawn without the approval of 50% approvers.

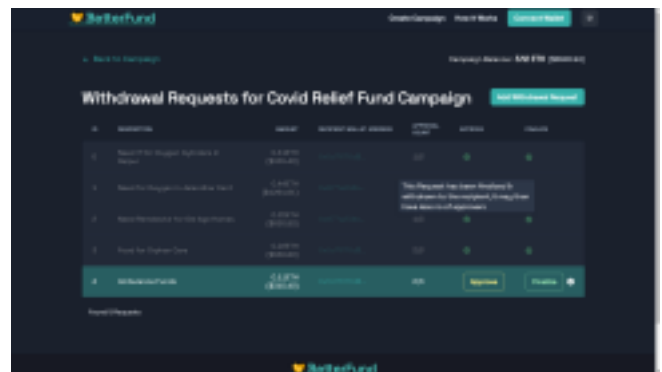


Fig 3: The “Withdrawal Requests” screen

IV. TECHNICAL ANALYSIS

UML Diagram

Class Diagram

The **Classes** defined are:

- Campaign
- CampaignFactory
- Requests
- connectWallet

The **Relationships** defined are:

- A User connects his wallet to support various campaigns; one to many.
- A campaignFactory has its Campaign; one to one.
- A Campaign has multiple Requests; one to



many.

Fig 4: Class Diagram showing class and object relationships



Fig 5: Technologies Used

Tech stack analysis :

In order to achieve the solution we have chosen a tech stack that is

- Optimized for speed
- Efficient
- Secure

The Technologies that have been used are :

1. **NextJS** : Next.js^[3] is an open-source React front-end development web framework that enables functionality such as server-side rendering and generating static websites for React based web applications.
2. **Chakra UI** : Chakra UI is a simple, modular and accessible component library that gives the building blocks one needs to build React applications.
3. **Solidity**^[4] : It is the programming language for implementing Ethereum based Smart Contracts.
4. **Web3** : web3.js^[5] is a collection of libraries that allow you to interact with a local or remote ethereum node using HTTP, IPC or WebSocket.
5. **Ethereum Smart Contract** : It is the collection of functions and data that reside at a specific address on the Ethereum Blockchain^[6].

V. RESULT AND DISCUSSION

App Usage Instructions

1. Connect Wallet :

In order to perform any transactions, be it 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^[7] to connect the wallet, which can be used to authorize transactions for cryptocurrency.



Fig 6: Flow diagram to connect a wallet

4. Making a Withdrawal Request

If you are the creator of a fund, you might need to withdraw from the available funds for various reasons. You can create a Withdrawal Request by the flow given below, which must be approved by the majority of approvers.

If you are a Contributor who has contributed more than the Minimum Contribution (specified in the campaign), then you are an approver. You can vote on the Withdrawal

requests made by the creator, and either approve or deny the request.

No funds can be withdrawn without the approval of at least 50% of the approvers.

The process is simple:

1. Click on the 'Create Withdraw Request' button on the campaign management page.
2. Fill out the form which will ask for the **amount** you are requesting, the **reason** for the withdrawal, as well as the **address to which the funds will be transferred**, should the request be approved.
3. Authorize the creation of the request with Metamask.
4. A page will show up which shows all the withdrawal requests for this campaign. This page is also visible to approvers of a campaign and they can approve or deny the request.
5. Once a request has gained a majority approval, the funds can be withdrawn.
6. Withdrawal of funds is performed and the amount is transferred directly to the payee, and not to the creator of the campaign.

This provides complete transparency in the process of withdrawing funds. Approvers can see where their money is going. The creator is not the intermediary of the transfer of funds.

Flow for making a withdrawal request is on the following page:

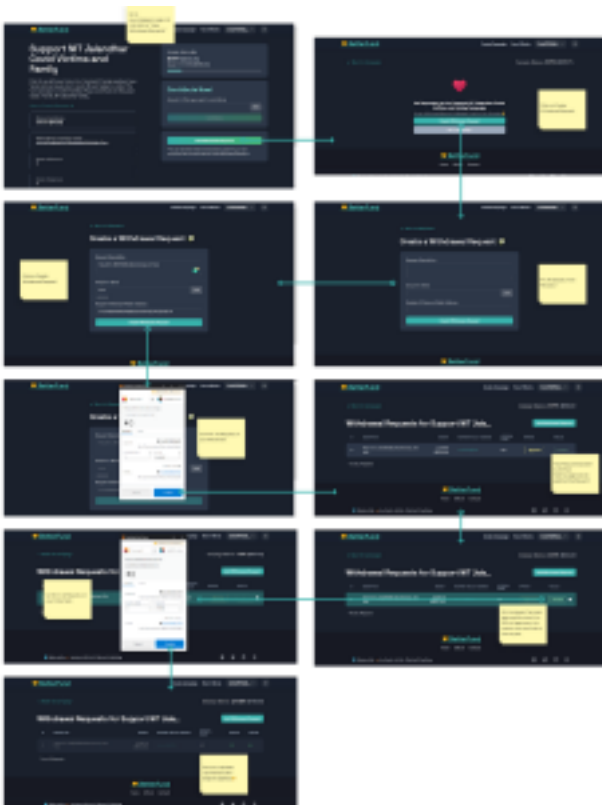


Fig 9: User journey to view and make withdrawal requests

VI. DEPLOYMENT AND TESTING STATUS

- The **frontend of the application** has been deployed and hosted to Production on Vercel and has been tested by unit tests as well as has been manually tested by a sample group of 10 users.
- The smart contract has been deployed to Rinkeby^[8] which is an Ethereum Test Network, typically used by developers to run rigorous tests of the application. The address of the smart contract is "0x2Bec4B5E67FE9e6Ba5768D83d49a71A60067B813" and all the transactions can be seen here:
<https://goerli.etherscan.io/address/0xD4524BE96345Ec203c6c2863F8bD93BA89C2b15a>
- The Application is fully live and functional and can be used here:
<https://cryptocrowdfund.vercel.app/>

VII. CONCLUSION

Our Project, “CryptoCrowdFund: Crowdfunding Platform powered by Blockchain”, is complete, live and fully functional.

Conventional crowdfunding methods have long suffered from lack of transparency and fraud. It is an avoidable problem, and we believe that we have implemented a solid solution that can do away with these long-standing problems.

The aim to have a transparent, anti-fraudulent, decentralized platform has been achieved to a great extent. This project has covered the weak points of general crowdfunding platforms to provide transparency to the process of crowdfunding and build trust among people, so that they may contribute their wealth to good causes without fear of fraud.

VIII. LINKS & REFERENCES

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<https://www.rinkeby.io/#stats>