Crowd Funding using Blockchain

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Abstract

Crowd funding is an online money-raising strategy that began as a way for the public to donate small amounts of money to help creative people finance their projects. Through crowdfunding, individuals are able to invest in entrepreneurial start-ups through an intermediary, such as a broker-dealer. The problem with the current sites is they don't provide the Donor Guarantee Policy and they don't have control over the money they donated. This paper is to propose crowdfunding using blockchain technology. Through this, we can provide a safe, secure and transparent way for crowdfunding. This work of this paper is to provide interactive forms for campaign creation, donation and request approval through which both campaign creators and donors can easily create and fund the campaigns. The Donor can able to track the money that they were sent. The Blockchain will record all the transaction and store as a block.

Keywords- Crowd funding, Blockchain, Campaign, Smart Contracts, Request-Approval, Consensus

I. INTRODUCTION

The blockchain is an incorruptible digital ledger that records every transaction. It is a distributed system thus all the records are stored in every node in the decentralized network. Ethereum allows running applications in the blockchain called Smart Contracts. All the Smart contracts are run on the Ethereum Virtual Machine. Crowdfunding provides an easy way to find cash for innovative project ideas. The problem with the current crowdfunding companies is that they charge high fees and sometimes there were scams happened. Implementing a crowdfunding strategy in blockchain will help to avoid these types of problems. By incorporating Peer to Peer smart contract for crowdfunding remove the traditional transaction fees and platforms fees normally associated with other crowdfunding platforms, such as Kickstarter. The objective of our project is to create a reliable application so that every new idea gets life. We have designed a crowdfunding site which is a blockchain based website. We provide an easy to use interface for everyone to create and post their ideas on this application. These ideas then become public to everyone. Anyone who wishes to support their ideas can contribute. All these processes are done in an interactive manner.

II. PROPOSED SYSTEM

In the existing system, the problem is that the companies charge heavily to both the donor and the user. There is no track of the records of the money, transparency, communication between the investor and the user is developing the project. The trust is the main problem when it comes to the crowdfunding with the existing companies. None of these companies provide the donor guarantee policy.
- Not Transparent
- High Charges
- Donor guarantee policy not available
- No track of Records

In the proposed system, the campaign creators will post their project ideas in the campaign and the interested people will donate the fund to the project idea. Where it defers from the old crowdfunding is that all the money is now digital currencies like ether. All ether coin will be recorded and keep tracks in the blockchain. Where the blockchain is an immutable ledger. The Donor has control over the funded money. With the Request approval module, the donor has full control over the money they invested. Only if one by two of the investors need to approve the request made by the creators. By giving control on invested money the Trust is built.
- Trust
- Control over money
- No charges
III. SYSTEM IMPLEMENTATION

All the contract code is written in solidity which is used to deploy contract in blockchain platform. The Campaign Factory is built which contains all the source code to deploy new campaign in the network. With the use of campaign factory, the new campaigns can be created. Whenever a campaign factory is deployed a one-time gas fee is needed and it is a very small amount. Initially, the new Campaign is created by giving the Idea of the project, Minimum Contribution to the project and detailed description of the project. When a new campaign is created a block will be created and added to the blockchain. Fig.1 shows the architecture of the system.

![Fig. 1: Architecture Diagram](image)

The proposed system is implemented using the solidity programming language. Solc is the solidity compiler used to compile the Campaign Factory and Campaign file into bytecode and abi. The Bytecode will be deployed in the blockchain where the abi is in JSON format and is used to interact with the front-end. The front-end is designed using the React Js, Next Js, and Semantic-UI. The user interactive form will be used to contribute easily. The creator or manager of the project is to request money for buying some accessories. He will create a request using the request form. This will be recorded and stored in the blockchain. All the investors need to approve the request if it is necessary. If not they can reject the request. Once all the investor all voted then the request will be finalized, there should be a minimum of 1/2th of the investor should be approved the request. If it meets the requirement then the money will be transferred to the vendor.

IV. METHODOLOGY

A. Overview
Both Crowdfunding and Cryptocurrency is a trend on the Internet and they match perfectly. Blockchain technology is one solution that can be used to reduce the problems that occur in crowdfunding. The contract is written in a way that all money will be added to the pool. When the request meets the specified condition then all the money will be transferred to the recipient. Fig 2. shows the working model.

Ethereum is an open-source, public, blockchain based distributed platform and operating to featuring smart contract functionality. It is the modified version of Bitcoin via transaction-based state transitions. Ether is a cryptocurrency which is generated and used by the Ethereum platform. Ethereum provides a decentralized operating, the Ethereum Virtual Machine (EVM), which can execute an application on the public nodes.
B. Blockchain
The blockchain is originally originated from the Bitcoin, invented by unknown people. The Blockchain is a list of continuously growing records called blocks. Each Block is linked to each other and they were secured using cryptography. Blockchain has the characteristics of integrity, decentralization, Immutability, Security, Anonymity. Blockchains can be divided into three types: 1) public blockchain (Bitcoin and Ethereum); 2) consortium blockchain (Hyperledger and Ripple) and 3) private blockchain.

C. Peer to Peer
The very important part of how blockchain works are based on Peer to Peer (P2P) system. The whole blockchain is connected to all the node in the network. This means information stored on blockchain cannot be lost or destroyed, to do so have to destroy every single node on the network and that is impossible.

D. Consensus Protocol
Consensus protocol is the most important one in the blockchain technology. The Blockchain consensus protocol is what which keeps the blocks on all the node to synchronize with each other. The term 'Consensus' means that the nodes have to agree with the same state of the blockchain. Consensus protocol allows blockchain to be updated every minute (depends on the network) and ensures that every block in the chain is true. The aim of the consensus protocol is to guarantee a single chain is used and followed by all the nodes.

E. Proof of Work
Proof of work (abbreviated to PoW) is a consensus protocol used widely by many cryptocurrencies. This process is known as mining and the node on the network is called as miners. The Proof of Work is a mathematical problem one that requires considerable work to achieve the solution. The only way to solve the problem is through the node in the network have to run the process based on trial and error basis. A miner will continue testing different unique values until a suitable hash is produced. The miner who manages to solve will add next block, adding the block to the chain and validates all the transactions within it, and receiving the reward associated with the block. Fig. 4 illustrates the block.
Fig. 4: Illustration of Block

F. Modules
1) Campaign Creation
2) Create Request Module
3) Request Approval Module
4) Finalize Module

1) Campaign Creation
A new campaign is created by making an instance of the Campaign factory. The user will access the campaign factory with the user interface to create a new campaign. To create a campaign, we need to provide campaign title, minimum contribution, campaign description. For every transaction, a specific amount of gas fee is required for processing. Thus, when the user clicks "Create" button new campaign will be created with the gas fees associated. After 15 to 30 seconds, the transaction will be completed and a new block will be added to the blockchain with the contract address. After the campaign is created it will be displayed in the home page. The user and the donor can interact with it. The create campaign method in the contract is called to create a new campaign. Once the campaign is created and added to blockchain then an E-Wallet or account is required to manage the transaction associate with it. Because every change that need to happen in the blockchain we need to provide some amount of money to make that transaction a valid one, the amount is called gas fee. Fig. 4 shows the Create Campaign Module.

Fig. 4: Create Campaign
2) **Create Request Module**

After creating a new campaign, the donors will donate and contribute to the campaign. The user cannot use the money directly, to use them they need to provide the request for using. For instance, if the user wants to buy something for the project then he needs to create a request for buying with detail and the vendor address. This will then make a transaction and it will add a block to the blockchain. He cannot use the money directly, because using money directly will lead to many scams that were present with many crowdfunding platforms. Fig 5 shows how to create a request.

![Create Request Module](image)

**Fig. 5: Create Request Module**

3) **Request-Approval Module**

The campaign creator will make a request for spending money to buy some accessories or anything with proof. Then all investors will be notified that the creator needs to spend some money. So the investor needs to approve the request if he wants. Only one approval can vote for one investor. With a specific time, all the investor should vote. All the request approval will be recorded and stored in the block. After that, the investor cannot give approval again. Fig. 6 shows the Request-Approval Module.

![Approval module](image)

**Fig. 6: Approval module**

4) **Finalize Module**

When the Investor voted all the approval are recorded. If the approval is more than the specified condition like two-third then the money will be automatically transferred to the Vendor that the creator needs to send. All the transactions are stored in the
blockchain. The creator should specify the vendor in detail and the address to which money should be transferred. After money transferred the campaign detail with summary will be displayed. Fig. 7 show the detailed summary of the campaign.

![Campaign Summary](image)

**Fig. 7: Campaign Summary**

V. CONCLUSION

Blockchain in crowdfunding is a relatively new concept to the community. We have taken that into consideration and designed this app so that even a common man can use it with ease. But this is not the end. With the evolution of Blockchain and introducing of ICOs, our application has a bright future and a large scope for improvement and evolution. The world is still adjusting to Blockchain and Cryptocurrencies and it'll take a couple of years more for Ethereum based Dapps to become popular and to be recognized by the community. In such a situation Blockchain based crowdfunding application is a tough concept to be understood by everyone. We have taken that into consideration and designed this app so that even a common man can use it with ease. But this is not the end. With the evolution of Blockchain and introducing of ICOs, our application has a bright future and a large scope for improvement and evolution. In the future, we wish to provide an even easier and safer way for all ideas to get life through our crowdfunding application.

REFERENCES