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Blockfunds: Blockchain Based Crowd-Funding App

Ranjeeta Krishan[1], Abhishekh Khare[2], Darshana Sahu[3], Hrishabh Kumar Singh[4], Harsh Vardhan Sharma[5]

[1]Assistant Professor, Bhilai Institute of Technology, Raipur, Chhattisgarh, India
[2,3,4,5]Student, Bhilai Institute of Technology, Raipur, Chhattisgarh, India

A B S T R A C T

This project introduces a blockchain-based crowdfunding system that utilizes smart contracts to revolutionize the way fundraising campaigns are conducted. The smart contracts, developed using Solidity, automate various processes involved in crowdfunding, including campaign creation, contribution tracking, and secure storage of information on the blockchain. By harnessing blockchain technology, the system offers transparency, security, and efficiency in managing crowdfunding operations. This report explores the system's architecture, functioning principles, implementation details, and evaluates its performance. Additionally, it analyzes the advantages and limitations of adopting a blockchain-based approach in crowdfunding. The project highlights the potential of blockchain to transform the fundraising landscape, providing a decentralized, transparent, and inclusive platform for creators and backers alike.

Keywords: Blockchain, Decentralized, Crowd-funding, Smart Contract.

1. Introduction

Crowdfunding is a powerful way to raise funds for projects, differing from traditional financing. It involves a group of people contributing money instead of using banks. Freedman and Nutting describe it as collecting small amounts through online platforms to finance projects like startups, products, or causes. With blockchain, crowdfunding becomes safer and more innovative. The key players are contributors, crowdfunding platforms, and project managers.

The main benefit of crowdfunding is that it can raise the amount of money needed in short amount of time. This is because many individuals today utilize the Internet and social media, enabling project founders to swiftly connect with the public through these channels in a short period.

One of the primary challenges in traditional crowdfunding platforms is the prevalence of fraud cases, argues that online crowdfunding exposes contributors to fraud because conventional legal and reputation security measures may not be effective. Additional issues in crowdfunding identified by various researchers include: 1) significant delays in rewards, 2) campaign initiators discontinuing communication with backers for more than six months after an unmet delivery date, or 3) failure to deliver the promised product with inadequate refunds to backers.

Designing smart contracts within a crowdfunding system allows for a secure mechanism where funds from contributors are held until a specified date or goal is achieved. Depending on the outcome, the funds are either released to the project owners or safely returned to the contributors, ensuring a transparent and trustworthy crowdfunding process.

Blockchain can be defined as a distributed database of records of all transactions that have been executed and shared among participated parties. The characteristics of blockchain includes decentralization of data, persistency, anonymity and auditability. The decentralization and transparency provided by blockchain technology have transformed the interaction between innovators, donors, and consumers, giving donors the assurance of a safe investment and innovators a platform to launch their ideas.

1.1 Blockchain

Blockchain is a leading database mechanism that stores data in blocks which are linked to each other in the form of chain. It is an immutable ledger that facilitates the process of recording transactions and allows transparent tracking and sharing of assets in a business network.

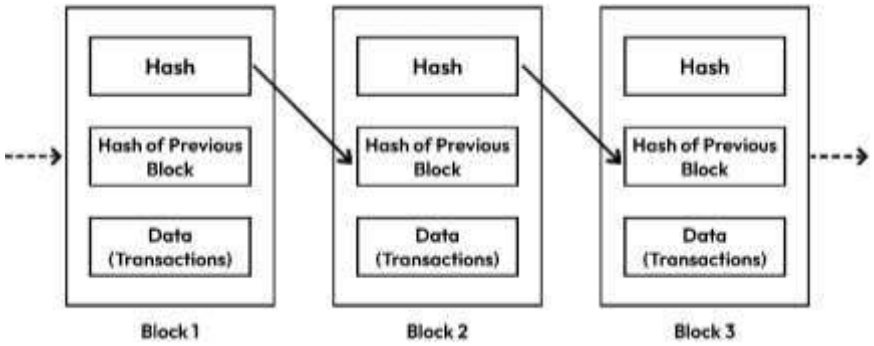

Fig. 1 – Simplified diagram of a blockchain.

1.2 Decentralized Apps (dApps)

Decentralized apps are the application which are built using the blockchain technology and run on a distributed network of computers called peer-to-peer (P2P) network instead of on a single sever. The dApps run using the smart contracts, providing robust security to all the transactions and data. Some of the popular dApps are CryptoKitties, OpenSea, WINk, InterPlanetary Search Engine (IPSE) and Blockchain Cuties.

2. Methodology

The system utilizes ReactJs for the front-end, NodeJS for the backend, and Solidity for contract development. Contracts are compiled into JSON-formatted ABI code using the solc npm package. The ABI interface is parsed to a Web3 provider for contract deployment, with Infura serving as the remote node to connect to the Ethereum network. Metamask, a browser extension, is required for user interaction. Campaign creation, contributions, and expense requests are managed through Metamask, with contributors deciding on expenses. The prototype connects to the Rinkeby testnet, using a proof-of-authority blockchain. Ether is obtained from the Rinkeby Test Faucet, and transactions are viewable on Etherscan using the provided API. System architecture is depicted in Figure 1, and Figure 2 illustrates the Ethereum transaction flow.

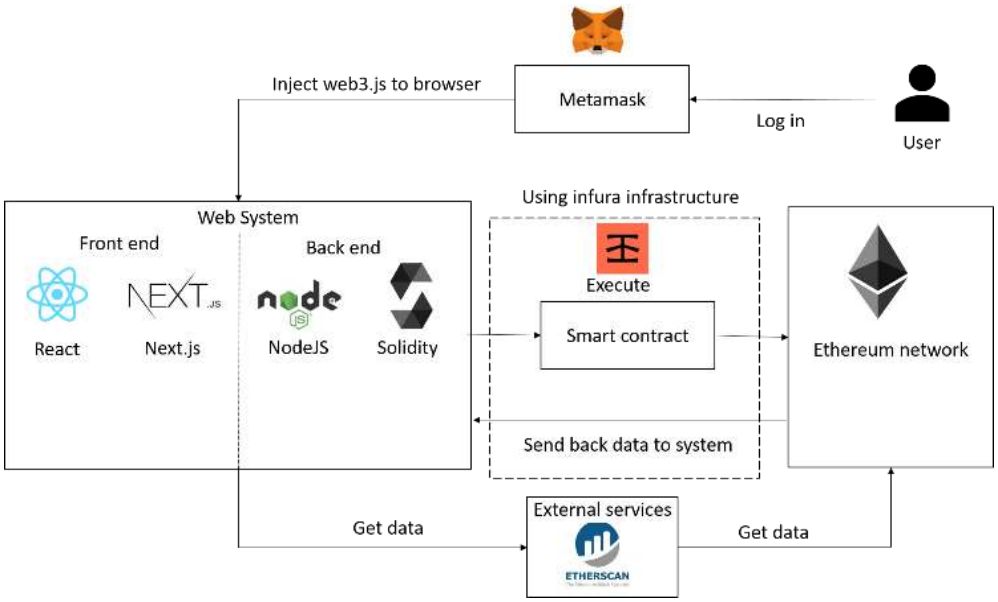

Figure 1. System architecture

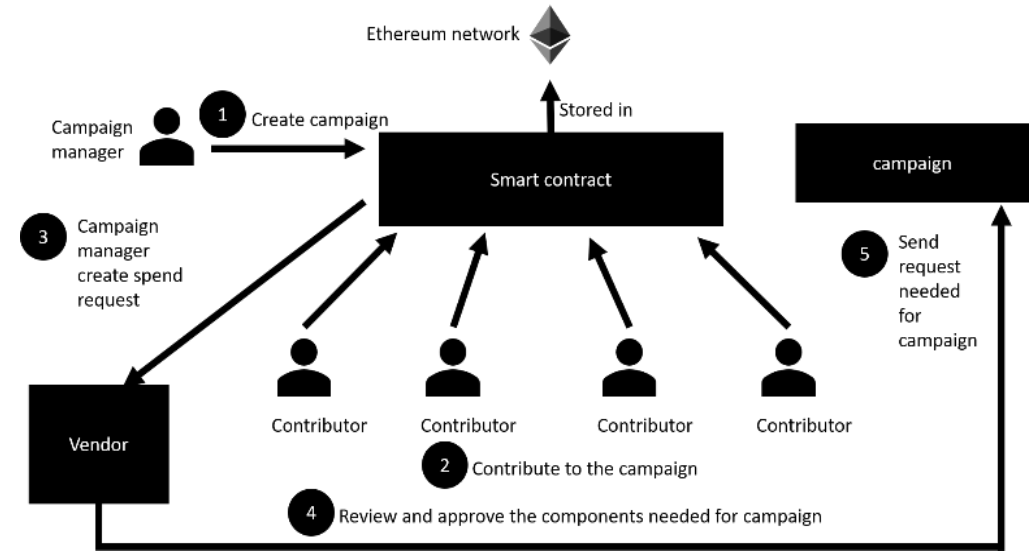

Figure 2. Flow of ether in proposed blockchain model

Flow:

a. Campaign manager create campaign. To create the campaign, he needs to fill campaign details. To convince contributors, he also may upload the proposal in PDF format. The proposal will be stored in Inter Planetary File System (IPFS), a peer-to-peer file sharing system.

b. The campaign then will appear in campaign page. If contributors are interested with the campaign, he may contribute to the campaign.

c. Campaign manager create expense request, which consists of list the items needed to execute the campaign.

d. Contributors received notifications new expense request has been added.

e. Contributors review either the item proposed by campaign manager is appropriate or not, if it is appropriate, then contributors can vote to agree with the item listed.

f. If majority of contributors agree, smart contract will send collected funds to the respective vendors.

g. The respective vendor then sends the item agreed to the campaign manager.

Each transaction is recorded in blockchain and can be seen by all users in Ethers can website as

Figure 3. Records of Ethereum transaction

3. RESULTS AND ANALYSIS

Implementation of blockchain in crowdfunding enhances contributor privacy by leveraging transparent transactions. Blockchain records, accessible through tools like Etherscan API, allow all users to view each transaction, ensuring transparency without compromising confidentiality. Additionally, smart contracts automate the execution of conditions, removing the necessity for stakeholders to rely on trust in the campaign process.

4. Conclusions

The blockchain-powered crowdfunding platform aims to revolutionize the crowdfunding landscape by addressing the limitations of conventional methods. Blockchain focuses on enhancing transparency and reducing the risk of fraudulent activities and it enables secure and transparent funding processes, fostering innovation and empowering creators in a trustworthy environment. The integration of blockchain technology into crowdfunding platforms is not merely a technical enhancement; it is a reimagining of economic and social interactions.The model proposed and examined in this study eschews the traditional, centralized systems of transaction and communication, favoring a distributed approach that inherently democratizes the process of fundraising. By reducing operational and maintenance costs, the blockchain-based platform directly contributes to the stimulation of local economies and facilitates a more equitable distribution of wealth and value among community members.

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