
Blockchain Technology: Trusted Crowdfunding Platform Using a Smart Contract

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Abstract.

Advances in digital technology brought about in the recent past by blockchain's transparency, security, and decentralization have changed things. The present paper discusses a blockchain-enabled crowdfunding platform that eliminates fraud, processes that go undocumented, and accountability issues that arise in the existing systems. Automation takes place with the use of Ethereum blockchain and smart contracts. The implementation of the smart contract employs Solidity, testing and deployment is handled through Foundry, and wallet integration is with MetaMask. HTML and JavaScript facilitate user navigation, moving blockchain nearer to the user interface. The platform addresses problems such as latency and complexity, providing a trustless, low-cost funding system. Future updates can incorporate token integration and cross-chain compatibility for increased stability and user adoption.

Keywords. Blockchain, Crowdfunding, Ethereum, Smart Contracts, Decentral-ized Systems, Solidity, Foundry, Metamask, Secure Transactions, Decentralized Applications (dApps).

1. INTRODUCTION

Blockchain, first put forward in 2008 as the foundation of Bitcoin [1], is now a key technology for digital networks. It securely stores data within a decentralized network, not allowing for alterations [2]. Because it can make encrypted, reliable, and unchangeable records, it is useful for a range of applications. Crowdfunding, in which individuals and organizations collect money publicly [1], usually is plagued by trust and security challenges in conventional models [3, 4]. Blockchain technology resolves crowdfunding challenges using decentralization, transparency, and immutability. Smart contracts release funds automatically, monitor transactions, and do away with intermediaries, saving costs and increasing security [3, 4]. This paper suggests a trustless crowdfunding model based on blockchain and smart contracts, overcoming the conventional constraints through a decentralized and transparent framework [5, 6]. This flow explains how a blockchain-based crowdfunding platform works with Ethereum and smart contracts. Users initiate transactions via wallets like MetaMask, which securely stores private keys [2]. Transactions enter Ethereum's "Transaction Pool" for miner validation. Once confirmed, the block is added to the blockchain, ensuring transparency and immutability.

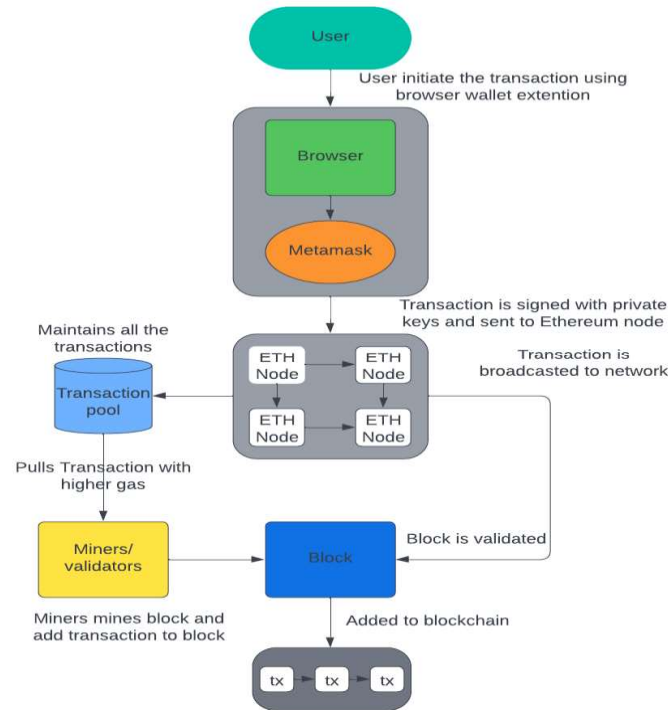


Figure 1 Blockchain Architecture.

This flow explains how a blockchain-based crowdfunding platform works with Ethereum and smart contracts. Users initiate transactions via wallets like MetaMask, which securely stores private keys [2]. Transactions enter Ethereum's "Transaction Pool" for miner validation. Once confirmed, the block is added to the blockchain, ensuring transparency and immutability.

2. PREVIOUS RESEARCH

Blockchain is improving crowdfunding through security and reliability. Trust in the platform and project creator in lending-based crowdfunding is important [8]. Blockchain platforms such as Nasdaq Linq remove intermediaries, facilitate direct transactions, and lock in voting [6, 9]. Smart contracts for automatic fund disbursement enhance transparency and security [5]. Decentralization of Blockchain improves efficiency, lowers costs, and enhances trust, although energy usage is an issue [4, 8]. Studies indicate blockchain can revolutionize raising funds by hardening trust [3].

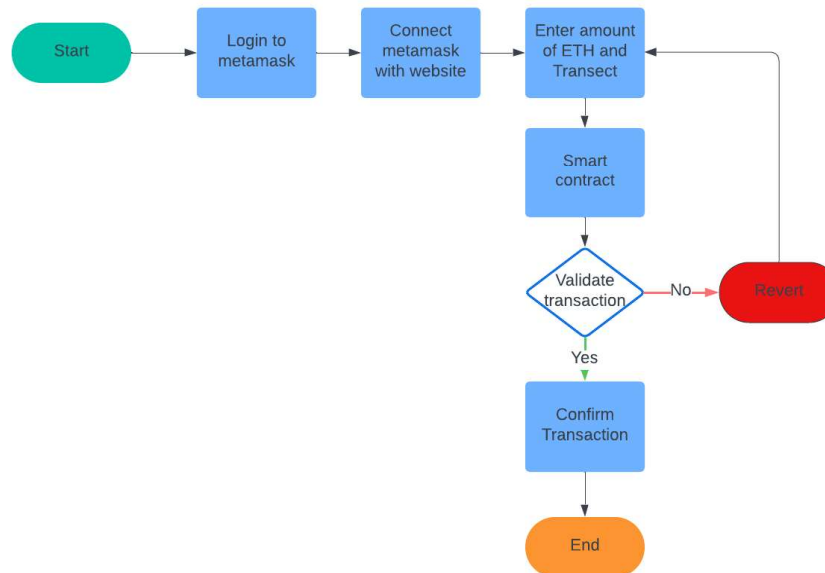


Figure 2 Work flow of the application.

The diagram shows the user journey in a blockchain-based crowdfunding system using MetaMask [2]. The user links MetaMask to the platform, enters their Ether (ETH) contribution [2, 4], and the transaction is verified for validity and sufficient funds [3, 5]. If valid, the transaction enters a queue for miners to add it to the block-chain [2, 3]. This process emphasizes user experience and the security of blockchain crowdfunding, including wallet management [8, 10].

3. TECHNOLOGIES USED

Our project leverages **Ethereum** for its secure and transparent smart contract support. We use **Solidity** to implement fund holding, controlled withdrawals, and access management. **Foundry**, including **Anvil**, enables local testing with unit, integration, and fuzz testing to ensure contract reliability. **MetaMask** facilitates secure user interaction, managing accounts and transaction signing. The frontend is built with **HTML** and **JavaScript**, utilizing **web3.js** or **ethers.js** for blockchain connectivity. JavaScript handles key actions like funding, balance checks, and withdrawals, ensuring seamless communication with the Ethereum network.

4. RESULT ANALYSIS

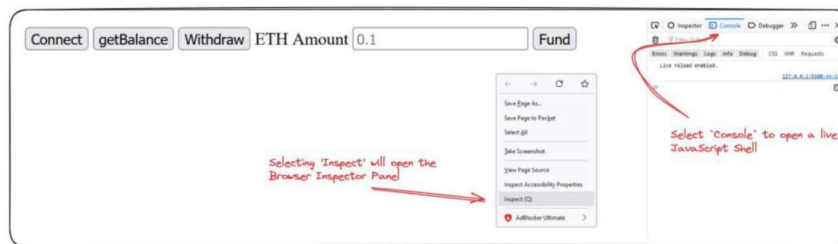


Figure 3 Frontend of the platform.

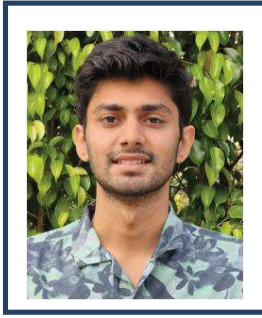
5. CONCLUSION

This crowdfunding platform demonstrates how blockchain technology can transform traditional crowdfunding by enhancing transparency, security, and reliability. Built on the Ethereum blockchain, it leverages smart contracts to automate fund management, eliminating third-party intermediaries. MetaMask ensures seamless integration and security, while an intuitive HTML and JavaScript-based frontend enhances user experience. By addressing fraud, delays, and accountability issues, this project improves the efficiency of crowdfunding ecosystems. Future enhancements could include token integration and cross-chain compatibility to expand functionality and improve user experience.

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Biographies



Gaurang Bharadava is a pre-final year undergraduate student passionate about blockchain, smart contracts, and decentralized applications. He and his team recently won the **Jury Innovation Prize** at **Hack IITK**, securing ₹1,00,000 for their innovative solution. **Madhav Desai** specializes in blockchain technology, focusing on decentralized solutions for secure transactions. **Anshuman Prajapati** is an Machine Learning developer experienced in AI and data-driven applications along with web based applications. **Manav Bagthaliya**, also an Machine Learning developer, works on predictive modeling and AI-driven automation. **Dr. Priyanka Patel**, the corresponding author, researches blockchain and machine learning integration for secure and intelligent decentralized systems.