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Crowdfunding Using Blockchain

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Abstract: *The turns of events in Web3 technology involves redefining online interactions by decentralizing applications and eliminating mediator. This paper details the turns of events in Web3-based crowdfunding platform utilizing Ethereum blockchain technology. The system incorporates Solidity Base smart contracts to ensure donation processes are secure, transparent, and efficient. Users can securely connect their MetaMask wallets for Ethereum transactions, allowing them to create campaigns, explore projects, and contribute funds through an intuitive and accessible platform. ThirdWeb streamlines the deployment and management of smart contracts, while Ethers.js enables blockchain interactions within the React and Tailwind CSS-driven frontend. The proposed system eliminates traditional crowdfunding restrictions, such as lack of central management, by providing high transaction fees, lack of transparency and decentralized alternatives. The platform includes essential functionalities such as campaign creation, donation tracking, and real-time transaction updates, enhancing user experience and trust. Thorough testing and user feedback emphasize the system's benefits over conventional crowdfunding platforms, such as lower transaction costs, improved security, and real-time tracking of Ethereum transactions. By using Web3 principles, the system provides a scalable, transparent and efficient solution for crowdfunding. Future developments will aim to integrate support for multiple blockchain networks and enhance accessibility for everyday users. This research contributes to the increasing adoption of decentralized financial applications and showcases the potential of blockchain-driven crowdfunding solutions.*

Keywords: Web3 technology

I. INTRODUCTION

Crowdfunding platforms have gained significant popularity in recent years, enabling individuals and businesses to raise funds for various projects. Nonetheless, conventional crowdfunding platforms frequently encounter issues related to trust, incur substantial transaction fees, and lack transparency. Blockchain technology offers a decentralized approach to overcome these challenges by enabling secure and transparent transactions without the need for intermediaries. This article proposes that Web3-based crowdfunding applications will use Ethereum blockchain, intelligent contracts and metamask integration to provide a secure and transparent funding ecosystem.

II. LITERATURE SURVEY/EXISTING SYSTEM

Traditional crowdfunding platforms like GoFundMe, Kickstarter, and Indiegogo are built on centralized systems, requiring users to trust the platform with fund management. These platforms often suffer from a lack of transparency and impose high service fees for fund distribution. Previous research highlights the potential of blockchain technologies to mitigate these problems by diversifying funding functions and ensuring transactions covered in manipulation.

Research gap or Limitation Existing System

Although blockchain-based crowdfunding provides numerous advantages, current platforms still face certain challenges and limitations, which are outlined below:

- Complexity of integrating blockchain solutions with user-friendly interfaces.
- Certain blockchain networks have high transaction fees
- Insufficient wallet integration for users lacking technical knowledge.

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- Limited features designed to support different crowdfunding models, such as donation-based, reward-based, and equity funding.

Objectives –

- Develop a decentralized crowdfunding platform that leverages Web3 technology and the Ethereum blockchain.
- MetaMask Character Pocket Integration ensures secure user authentication and simplifies transaction processing
- Implement smart contracts to manage campaign creation, funding, and withdrawals.
- Provide a user-friendly interface to create, view, and donate to campaigns.
- Assurance of transparency and security for every transaction.

Proposed System

The proposed system architecture encompasses the following components:

Analysis/Framework/Algorithm

The suggested system functions as a decentralized application that removes intermediaries in the crowdfunding process. The framework consists of:

- Blockchain Layer: Ethereum blockchain for storing campaign data and transactions.
- Smart Contract Layer: Solidity-based contract implemented through ThirdWeb.
- Frontend Layer: React and Tailwind CSS for a responsive UI.

Integration Layer: Ethers.js for blockchain communication.

The core algorithm includes:

- Creating campaigns and storing metadata on the blockchain..
- Users contribute Ether to campaigns through smart contracts.
- Securely retrieving campaign details and donor information.
- Disbursing funds to campaign owners once the goal is met.

Design Details – The application adopts a modular design strategy:

Smart Contract Design:

- Utilizes a Campaign structure to handle campaign information.
- Uses robustness assignments to enable efficient access to donation data and participation information.

Frontend Design:

- Built with Next.js/Vite for performance and scalability.
- Uses React components for navigation (Sidebar, Navbar, Dashboard).

Security Considerations:

- Smart contracts include access control mechanisms.
- .env configurations ensure private key security.
- Transactions use MetaMask for secure wallet interactions.

III. METHODOLOGY

Our approach involves:

1. Smart Contract Development: Writing and testing Solidity contracts using Hardhat.
2. Blockchain Deployment: Deploying via ThirdWeb.
3. Frontend Development: Creating an interactive UI with React and Tailwind CSS.
4. Integration & Testing:
    - Connects the frontend to smart contracts using Ethers.js.
    - Conducting unit and functional testing to ensure smooth blockchain interactions.

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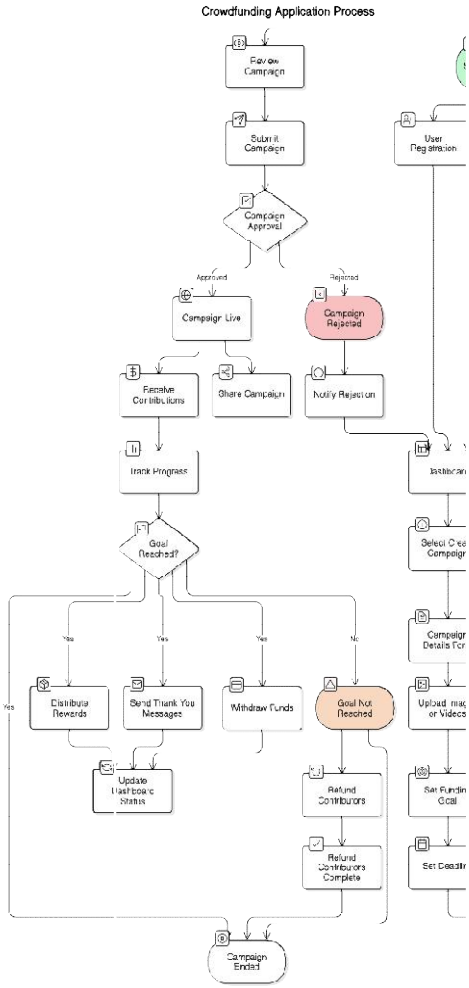
Implementing security best practices for Ethereum transactions



IV. RESULTS AND DISCUSSION

The Web3 crowdfunding platform enhances security, transparency, and efficiency in digital fundraising. By eliminating intermediaries, it reduces transaction fees and allows direct engagement between donors and campaign creators. The smart contract implementation guarantees the secure handling of funds and enables real-time processing of Ethereum transactions. User feedback revealed that the system offered a seamless experience with straightforward MetaMask integration, user-friendly navigation, and dependable donation processing. The smart contract's ability to track campaigns and donations was validated through performance testing. Future enhancements will aim to reduce gas fees, increase user accessibility, and broaden support for multiple blockchains.

V. CONCLUSIONS

The Web3 crowdfunding platform provides a decentralized, transparent, and secure alternative to traditional fundraising platforms. By integrating Solidity smart contracts, MetaMask, and ThirdWeb, the system ensures efficient Ethereum-based transactions. Future improvements will focus on reducing transaction expenses, enhancing accessibility, and supporting multi-chain functionality to broaden its usability and impact.

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VI. FUTURE WORK

Future research can explore:

- Scalability solutions: Layer 2 scaling and rollups.
- Cross-chain compatibility: Interoperability between Ethereum and other blockchains.
- Enhanced governance models: DAO-based decision-making for fund allocation.

By addressing these areas, blockchain crowdfunding can reach its full potential in democratizing fundraising.

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