



EtherFund - Transforming Crowdfunding through Blockchain

Group No. 11

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Project Guide
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Abstract

- EtherFund, a blockchain-based crowdfunding platform on Ethereum, ensures secure, transparent, and efficient campaign management with MetaMask integration and Solidity smart contracts for automated transactions.
- It enhances user experience with real-time monitoring, analytics, and receipt downloads, while prioritizing security through E2EE, email/phone verification, and expanding global reach via social media integration.

Real time problem -

1. Lack of Transparency - Inadequate clarity on fund usage.
2. High Fees - Excessive platform and transaction fees.
3. Slow Payment Processing - Delays in fund disbursement.
4. Security Risks - Vulnerability to hacking and data breaches.
5. Limited Global Access - Regional restrictions limit audience reach.

Introduction

- Traditional crowdfunding platforms struggle with transparency, high fees, slow payments, limited global access, and complex campaign management, leaving key issues unresolved.
- EtherFund is a blockchain-based crowdfunding platform that uses Ethereum and smart contracts to ensure secure, transparent, and efficient campaign management.
- It integrates MetaMask for easy wallet connectivity, providing real-time monitoring and prioritizing data privacy.



Motivation

Traditional crowdfunding platforms face several key challenges that limit their effectiveness, including:

1. **Transparency Issues** - Unclear processes and fund tracking cause trust issues.
2. **High Fees:** Platform fees cut into campaign funds.
3. **Delayed Transfers** - Slow payments delay access to funds.
4. **Limited Global Reach** - Geographic and banking limits block wider participation.
5. **Complex Management** - Managing campaigns is overly complicated.

Objectives

1. To deploy Solidity smart contracts to automate campaign creation, funding, and management with trustless, seamless user interaction.
2. To integrate Ethereum blockchain and MetaMask for secure, transparent transactions and real-time updates.
3. To develop an analytics dashboard for in-depth campaign tracking and data-driven decision-making.
4. To implement social media integration, feed extraction, and receipt downloads to enhance user engagement and experience.
5. To ensure data privacy and security with features like end-to-end encryption (E2EE) and email/phone verification.

Literature Review

Sr.no	Title	Author(s)	Year	Methodology	Drawback
1.	[1] The rise and fall of cryptocurrencies: defining the economic and social values of blockchain technologies, assessing the opportunities, and defining the financial and cybersecurity risks of the Metaverse.	Petar Radanliev	2024	The methodology employs a multifaceted approach, the research combines 20 interviews and 3 workshops for practical insights, surveys of new data sources like IoT contracts, and a literature review of existing studies on blockchain and the Metaverse.	The drawback of the initial search was limited, requiring a broader review. Integrating multiple methods added complexity and might have missed practical impacts. The interdisciplinary approach could also lead to gaps in specific areas.
2.	[2] Decentralized Transaction System for Detection and Prevention of Fraud in Crowdfunding Platforms.	Bafna, Bhavana & Daigavane, Vedant & Shaha, Shlok & Shinde, Gaurav & Shelke, Sachin.	2023	The methodology involves develops a decentralized crowdfunding system using Ethereum smart contracts. Investors vote to approve spending requests, with funds transferred directly to vendors. The system is built with ReactJS (NextJS), Express.js, and MongoDB, and ensures secure transactions using ThirdWeb SDK and Solidity smart contracts.	Creating a decentralized system with blockchain and smart contracts is technically complex and requires advanced expertise. Regulatory uncertainties and privacy concerns arise from blockchain's transparency, while integration with existing systems can be challenging. High transaction fees on networks like Ethereum may also deter smaller investors.

Literature Review

Sr.no	Title	Author(s)	Year	Methodology	Drawback
3.	[3] Decentralized News-Retrieval Architecture Using Blockchain Technology	Alexandrescu, Adrian, and Cristian Nicolae Butincu	2023	The paper proposes a decentralized system using blockchain to retrieve and verify news articles. It separates the extraction of webpage links (crawling) from the extraction of article information (scraping), allowing third-party actors to perform these tasks. A majority-rule mechanism ensures the accuracy of information, and the blockchain network provides traceability.	Implementing such a system is complex and requires advanced technical skills. There's also regulatory uncertainty around blockchain technology, and potential privacy concerns due to blockchain's transparency. Additionally, integrating this system with existing platforms can be challenging.
4.	[4] A secure email solution based on Blockchain.	Castillo, Diego & Bermejo, Javier & Machio, Francisco.	2022	The paper proposes a blockchain-based email solution to enhance security against viruses, spam, and phishing. It uses blockchain to ensure integrity, confidentiality, and secure interactions between email components.	The implementation of blockchain-based email security may face challenges in terms of integration with existing email systems, potential scalability issues, and the need for users to adapt to a new architecture. Additionally, the complexity and resource requirements of blockchain could lead to higher operational costs.

Literature Review

Sr.no	Title	Author(s)	Year	Methodology	Drawback
5.	[5] The Application of Blockchain in Social Media: A Systematic Literature Review	Mahamat Ali Hisseine , Deji Chen and Xiao Yang	2022	The paper reviews 42 studies to explore how blockchain can improve social media by addressing issues like misinformation and data privacy. It focuses on blockchain features like smart contracts, consensus mechanisms, and decentralization to enhance transparency and security.	Key challenges include scalability and storage limitations, which hinder the integration of blockchain with social media. The vast data volume in social media strains current blockchain models, requiring further research to resolve these issues.
6.	[6] Block Chain - Based Crowd Funding Using Ethereum	Ayush Sharma, Prashant Sharma, Nitin Goel, Ramendra Singh	2022	The paper explores a crowdfunding platform that uses blockchain technology to ensure secure and fast transactions. It leverages a decentralized network with arbitrary nodes, enabling trust and reducing fraud between investors and fundraisers. The use of blockchain and cryptocurrency enhances transparency and security in the crowdfunding process.	Despite its benefits, blockchain-based crowdfunding faces challenges such as regulatory uncertainties and the complexity of integrating blockchain with traditional systems. Additionally, using cryptocurrency may limit participation due to fluctuating values and the need for technical knowledge.

Literature Review

Sr.no	Title	Author(s)	Year	Methodology	Drawback
7.	[7] Blockchain-enabled End-to-End Encryption for Instant Messaging Applications	Singh, Raman & Nandan, Ark & Tewari, Hitesh.	2022	The paper introduces a blockchain-based E2EE system where users generate their own encryption keys, stored on a public blockchain. This eliminates the need for service providers to manage keys, ensuring secure communication with forward encryption.	While the proposed system improves privacy and decentralization, it faces challenges with scalability and integration across different platforms. Additionally, the reliance on blockchain may lead to increased latency and higher computational costs, making it harder to implement on a global scale.
8.	[8] An Overview of Blockchain Online Social Media from the Technical Point of View	Barbara Guidi	2021	The paper aims to explore how blockchain can address privacy, censorship, and ownership issues in traditional social media. By leveraging decentralized platforms, users can gain control over their data and content, offering a more secure and transparent alternative to current social networks.	Challenges include high transaction fees, scalability issues, and the fact that most blockchains, except Steem and Hive, are not optimized for social media environments. Current blockchains still lack the efficiency needed for large-scale platforms like Facebook or YouTube.

Literature Review

Sr.no	Title	Author(s)	Year	Methodology	Drawback
9.	[9] Decentralized Crowdfunding Platform Using Ethereum Blockchain Technology	Siddhesh Jadye, Swarup Chattopadhyay, Yash Khodankar, Dr. Nita Patil	2021	The paper compares traditional crowdfunding with blockchain-based platforms, focusing on decentralization, smart contracts, and tokenization to enhance security, efficiency, and fraud prevention.	While blockchain offers increased security and transparency, its adoption is hindered by a lack of knowledge and understanding of the technology. High implementation costs and scalability challenges also slow down its integration across industries.
10.	[10] The role of blockchain technology-based social crowdfunding in advancing social value creation	Loan T.Q. Nguyen, Thinh G. Hoang, Linh H. Do, Xuan T. Ngo, Phuong H.T. Nguyen, Giang D.L. Nguyen, and Giang N.T. Nguyen	2021	The study used a qualitative approach with three case studies of blockchain crowdfunding platforms. Data from 29 interviews and archival research were analyzed using thematic analysis to explore blockchain's role in social value. Data were collected from mid-2019 to March 2020.	A key drawback is the lack of regulations for blockchain and cryptocurrencies, making it difficult for platforms to operate. Cryptocurrency instability adds risk, and smart contracts aren't legally enforceable, with human errors still posing issues.

Literature Review

Sr.no	Title	Author(s)	Year	Methodology	Drawback
11.	[11] Smart Contract and Blockchain for Crowdfunding Platform	Firmansyah Ashari, Tetuko Catonsukmoro, Wilyu Mahendra Bad, Sfenranto, Gunawan Wang	2020	The authors conducted a literature review, analyzing the processes typically involved in fundraising organizations and how blockchain technology and smart contracts could be applied. They discussed three dominant crowdfunding schemes and examined how blockchain and smart contracts could increase trust and reduce the reliance on third-party intermediaries	The implementation of blockchain and smart contract technology comes with several challenges. Firstly, it requires a high cost, particularly if an organization chooses to implement the technology using its own resources. Additionally, most smart contract service providers utilize cryptocurrency, which presents another challenge as not all governments legally recognize or permit the use of these currencies
12.	[12] Blockchain analytics and artificial intelligence	D. N. Dillenberger, P. Novotny, Q. Zhang, P. Jayachandran, H. Gupta, S. Hans, D. Verma, S. Chakraborty, J. J. Thomas, M. M. Walli, R. Vaculin, K. Sarpatwar	2019	Blockchain offers enhanced security, transparency, and efficiency compared to traditional systems. Despite its benefits, adoption is slow due to limited knowledge and challenges in integration. This paper highlights how blockchain can solve issues like fraud, inefficiency, and lack of transparency, motivating industries to embrace its potential.	Blockchain systems face challenges with handling large-scale data processing workloads, particularly for complex analytics. Off-chain analytics, while efficient, introduces privacy risks and extra overhead in transferring data to external databases.

Research Gap(Limitations of existing systems)

- Existing systems face issues like lack of transparency, security breaches, and misinformation. Centralized platforms struggle with trust.
- Privacy, security, and authenticity in transactions and content sharing remain unsolved, despite blockchain's potential.
- Blockchain and decentralized systems enhance security and transparency. Integration with AI/ML shows promise in combating fake news and securing transactions.

Problem Definition

- Traditional crowdfunding platforms rely heavily on central authorities to manage campaigns and funds, which can lead to issues like high fees, mismanagement of funds, and security risks. Users must trust these platforms to protect their data and ensure that funds are used as intended. Moreover, the lack of transparency and global accessibility often limits the effectiveness and reach of these campaigns.
- EtherFund offers secure, transparent crowdfunding using Ethereum smart contracts and MetaMask integration.

Scope

1. Develop a blockchain-based platform to eliminate intermediaries, ensuring secure and transparent transactions.
2. Deploy Solidity smart contracts to automate campaign creation, funding, and management with trustless user interaction.
3. Integrate MetaMask for secure user authentication, wallet management, and end-to-end encryption (E2EE).
4. Implement real-time updates and analytics dashboards for comprehensive campaign tracking and data-driven decision-making.
5. Create a platform that enables social media integration, feed extraction, and receipt downloads to boost user engagement and interaction.
6. Ensure data privacy and security through encryption methods and email/phone verification.
7. Design a user-friendly interface using React.js and Chakra UI, ensuring accessibility across devices.

Technological Stack

Frontend (Client-Side):

- **HTML5, CSS3, JavaScript:** Core languages for structuring, styling, and adding interactivity to the platform.
- **React.js:** Used for building a dynamic and interactive user interface, enabling seamless integration with Web3.js.
- **Chakra UI:** A component library for building accessible and responsive React applications.
- **Web3.js:** JavaScript library for interacting with the Ethereum blockchain and smart contracts.
- **MetaMask:** A browser extension for managing Ethereum wallets and facilitating user interaction with the application.

Backend (Server-Side):

- **Node.js with Express.js:** Optional server setup for handling requests and interacting with the blockchain for off-chain features.
- **MongoDB or PostgreSQL:** Database options for storing user data, campaign details, and off-chain information.

Technological Stack

Blockchain Layer:

- **Solidity:** Programming language for developing and deploying smart contracts on the Ethereum blockchain.

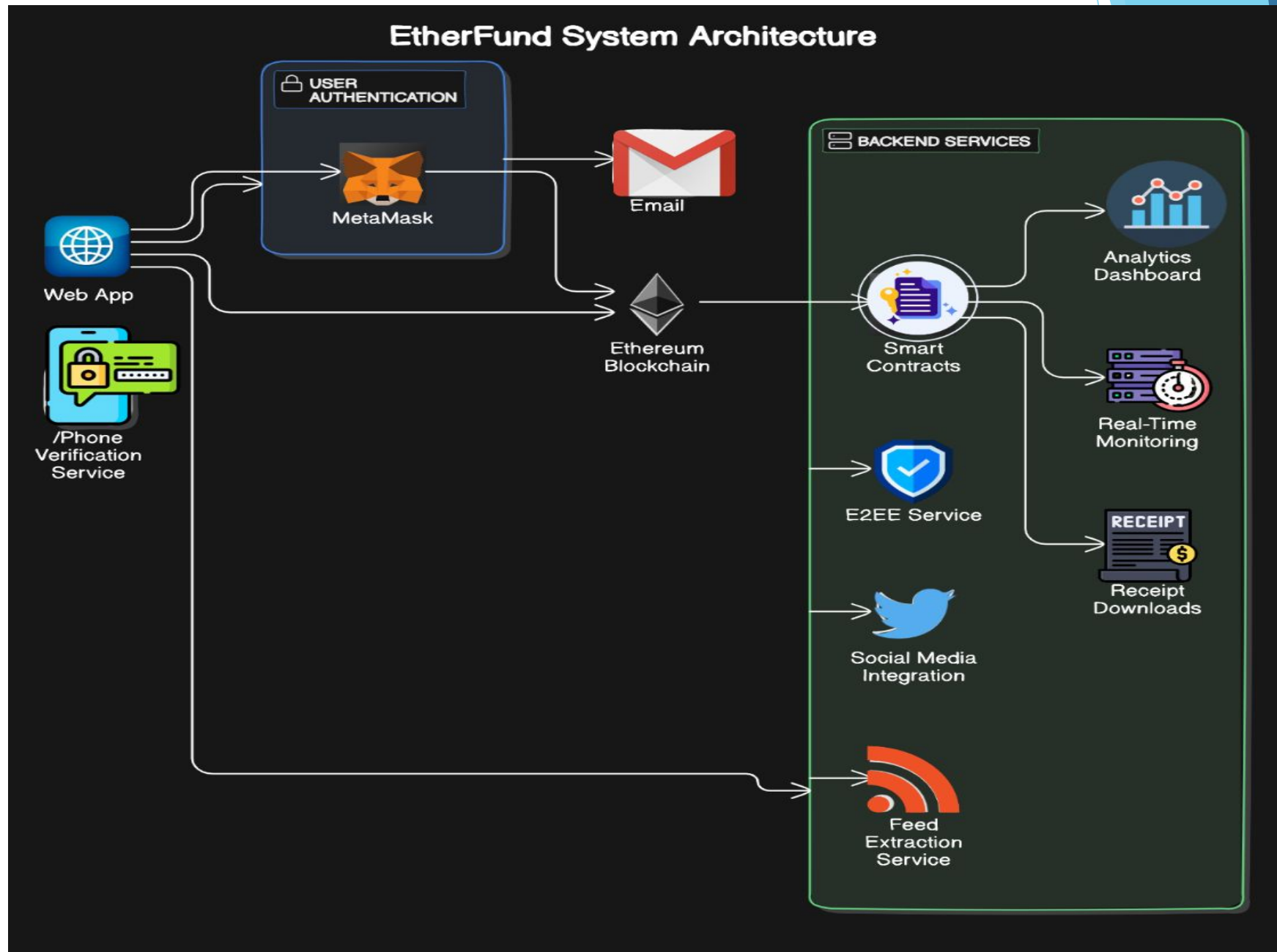
Encryption:

- **Crypto.js:** JavaScript library providing encryption algorithms like AES and RSA for securing sensitive data.
- **Web Crypto API:** Browser-based API offering cryptographic operations for key generation, encryption, and hashing.
- **BLAKE2:** High-performance cryptographic hash function used for secure data hashing.

Wallet Integration:

- **MetaMask:** Enables users to connect their cryptocurrency wallets for secure transactions and interaction with the platform.

Proposed system architecture/Working



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Thank You...!!