PROJECT REPORT

ON

Crowd funding using blockchain technology

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR SEMESTER VIII OF

B.E. (Information Technology)

SUBMITTED BY

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UNDER THE GUIDANCE OF

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DEPARTMENT OF INFORMATION TECHNOLOGY
V.E.S. INSTITUTE OF TECHNOLOGY
2024-25

Certificate

This is to certify that project entitled

"Crowd funding using blockchain technology"

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Place: VESIT, Chembur

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Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

Crowdfunding is an online fundraising strategy that initially emerged as a means for the public to contribute small amounts of money to support creative projects. However, existing crowdfunding platforms often lack transparency and control for donors. This proposal suggests leveraging blockchain technology to establish a secure and transparent crowdfunding platform. By utilizing blockchain, we can ensure the safety of transactions and provide donors with visibility into how their funds are utilized.

The proposed crowdfunding platform will offer interactive features for campaign creation and donation. This will streamline the process for both campaign creators and donors, allowing them to easily create and fund campaigns. With blockchain recording all transactions as blocks, donors will have the ability to track their contributions securely.

Unlike traditional charity models, crowdfunding often involves fees and carries inherent risks of project failure. Blockchain technology can mitigate these risks by introducing a decentralized approach to crowdfunding. By decentralizing control and leveraging blockchain's immutability, we can eliminate many of the potential risks associated with conventional crowdfunding methods.

In summary, by implementing blockchain technology, we can revolutionize crowdfunding, providing a safer, more transparent, and efficient platform for both campaign creators and donors alike.

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Chapter 1

Introduction

1.1 Introduction

Crowdfunding has emerged as a pivotal online fundraising strategy, originally conceived to support creative endeavors through small public contributions. However, prevailing crowdfunding platforms often lack transparency and donor control, necessitating a paradigm shift towards a more secure and transparent system. This proposal advocates for the integration of blockchain technology to establish a robust crowdfunding platform, addressing the inherent shortcomings of current models. By leveraging blockchain, we aim to create an ecosystem that ensures the safety, transparency, and accountability of crowdfunding transactions.

1.2 Aim and Objectives

The primary aim of this proposal is to introduce a blockchain-powered crowdfunding platform that revolutionizes the way projects are funded and supported online. The following objectives will guide the implementation of this aim:

- Develop an interactive platform for campaign creation, donation, enhancing user experience and accessibility.
- Implement blockchain technology, specifically utilizing Ethereum's test network, to record and validate all crowdfunding transactions securely. Enable donors to track their contributions transparently, fostering trust and accountability within the crowdfunding ecosystem.
- Establish a decentralized approach to crowdfunding, mitigating risks associated with conventional methods and promoting inclusivity and fairness.
- Facilitate the seamless integration of decentralized wallets, allowing users to connect effortlessly and engage in crowdfunding activities using cryptocurrency, particularly Ether.

1.3 Motivation for the Work

The motivation behind this endeavor stems from the inherent limitations of existing crowdfunding platforms. Traditional models often lack transparency, exposing donors to risks and uncertainties regarding the allocation of their contributions. Moreover, centralized control over funds poses challenges in terms of security and accountability. By harnessing the transformative potential of blockchain technology, we aim to address these issues comprehensively. Our motivation lies in creating a crowdfunding ecosystem that prioritizes transparency, security, and inclusivity, empowering both campaign creators and donors to participate confidently in supporting innovative projects.

1.4 Scope of Project

The scope of this project encompasses the development and implementation of a blockchain-powered crowdfunding platform with the following key features:

- Integration of decentralized wallets to facilitate user connectivity and participation.
- Creation of campaigns by users, enabling them to outline their projects and funding requirements.
- Provision for cryptocurrency donations, with a focus on Ether, leveraging smart contracts deployed on the Ethereum test network for enhanced security and efficiency.
- Transparent recording of all transactions on the blockchain, ensuring immutable and auditable records of crowdfunding activities.
- Emphasis on usability and accessibility, with intuitive user interfaces and seamless navigation to enhance the overall crowdfunding experience.

1.5 Organization of the report

This report is organized into the following sections:

1. **Introduction**

   This report will provide an overview of the crowd funding using blockchain, explain the purpose and scope of the report, and describe a activity monitoring system.

2. **Literature Survey**

   The existing system and their working which are prevailing in the market have been explored.

3. **Design and implementation**

   The approach that can be employed for the crowd funding decentralised application and their working are discussed in this chapter.

4. **Results**

   The result of the application built, have been discussed in this chapter.

Chapter 2

Literature Survey

2.1 Problem Definition

The current landscape of online crowdfunding platforms is plagued by several critical issues that hinder the effectiveness and trustworthiness of the fundraising process. Traditional platforms lack transparency, control, and security, leading to a lack of trust among donors and campaign creators. The key problems identified in the existing crowdfunding model are as follows: Existing crowdfunding platforms fail to provide adequate transparency regarding the allocation and utilization of donated funds. Donors often remain unaware of how their contributions are being utilized, leading to skepticism and mistrust. Donors face challenges in exercising control over their contributions once they are made. Without proper mechanisms in place, donors have little to no visibility or influence over the projects they support, exacerbating concerns regarding fund mismanagement.

2.2 Comparing existing systems

Title	Features	Shortcomings
Giveth (dApp)	Giveth provides transparent and traceable donations to charitable causes and decentralised projects.	Frequent disconnections of wallets, and significant amounts for transaction fees.
Seedlify (dApp)	Facilitates tokenized investments in early-stage startups with decentralised connectivity, offering visibility and access to projects while leveraging blockchain technology for transparency.	Longer response times for donations and campaign creation.

Chapter 3

Design Implementation

3.1 Proposed System

The proposed decentralized crowdfunding platform aims to revolutionize the fundraising landscape by leveraging blockchain technology, specifically deployed on the Ethereum-based Sepolia testnet. Utilizing React for the frontend, Solidity for smart contracts, and Web3 for blockchain interaction via RPC, the platform offers transparency, security, and efficiency in crowdfunding transactions. Users can create campaigns, donate cryptocurrency, and track fund allocation securely, with all transactions recorded immutably on the Sepolia testnet. Seamless integration of decentralized wallets enables users to connect and manage funds securely, while smart contracts ensure transparent fund management and secure transactions. While the platform operates on a testnet, considerations for regulatory compliance and user education are essential.

Overall, the proposed system presents a effective solution for decentralized crowdfunding, providing a transparent, secure, and efficient platform for both campaign creators and donors. By harnessing the power of blockchain technology and utilizing React, Solidity, and Web3, the platform offers seamless interaction with the Sepolia testnet, paving the way for a future of decentralized fundraising. With continual refinement and future enhancements, the platform aims to address limitations and challenges while advancing towards broader adoption and real-world deployment on the Ethereum mainnet.

3.2 Requirement Gathering and Analysis

Basic Requirements

1. **Stakeholder identification:**
   Stakeholders for this project include platform users, such as campaign creators and donors, who actively engage with the crowdfunding platform. Developers play a crucial role in building and maintaining the platform, utilizing technologies like React, Solidity, and Web3. The blockchain community represents a key stakeholder group, providing support, feedback, and potential collaboration opportunities. Regulatory authorities oversee compliance with crowdfunding regulations, ensuring the platform's legal and ethical operation.

2. **Requirements gathering:**
   Requirement gathering involves identifying and documenting the needs and objec-

tives of the project stakeholders. This process encompasses understanding user requirements, technical specifications, regulatory considerations, and usability factors to inform the development and implementation of the crowdfunding platform.

3. **Functional requirements:**
   The functional requirements for this project entail the implementation of key features essential for the operation of the decentralized crowdfunding platform. Firstly, users should be able to create campaigns, outlining project details, funding goals, and duration. Secondly, the platform must facilitate cryptocurrency donations, particularly Ether, through secure transactions managed by smart contracts. Thirdly, integration of decentralized wallets is crucial to enable users to securely connect and manage their funds. Additionally, transparent fund management is imperative, achieved through the utilization of blockchain technology to record all transactions immutably, ensuring accountability and visibility into fund allocation. Lastly, the implementation of robust user authentication mechanisms is essential to verify user identities securely and protect account access. These functional requirements collectively form the foundation of a transparent, secure, and user-friendly decentralized crowdfunding platform.

4. **Non-functional requirements:**
   The non-functional requirements for this project encompass various aspects crucial for the effectiveness and reliability of the decentralized crowdfunding platform. Firstly, the platform must exhibit high performance, capable of efficiently handling a large volume of simultaneous users and transactions while maintaining minimal latency and ensuring uninterrupted service. Secondly, robust security measures are imperative to safeguard user data, prevent unauthorized access, and maintain the integrity of transactions and funds. Additionally, scalability is essential, requiring the system to seamlessly accommodate increased user demand and activity without compromising performance or reliability. Usability is also a key consideration, necessitating an intuitive and user-friendly interface accessible to users with varying levels of technical expertise. Lastly, reliability is paramount, with the platform expected to provide consistent and dependable service, ensuring a positive user experience and fostering trust among stakeholders.

5. **Use case modeling:**
   The crowdfunding platform enables users to create campaigns, specifying project details, funding goals, and duration. Donors can contribute to campaigns using cryptocurrency, facilitated by smart contracts. Users can securely manage their funds through integrated decentralized wallets. The platform records all transactions transparently on the blockchain, ensuring accountability and visibility into fund allocation. Additionally, robust user authentication mechanisms verify user identities and protect account access.

3.3 Hardware Requirement

1. Desktop or mobile device
2. Network connectivity
3. OS (Windows / Linux / Mac) if using a desktop device

3.4 Software Requirement

1. VS code (IDE)
2. ReactJS library for frontend
3. Solidity for developing smart contracts
4. Web3.js library for interacting with blockchain network and connecting frontend with the smart contract.

3.5 UML Diagrams

3.5.1 Functionality FlowChart

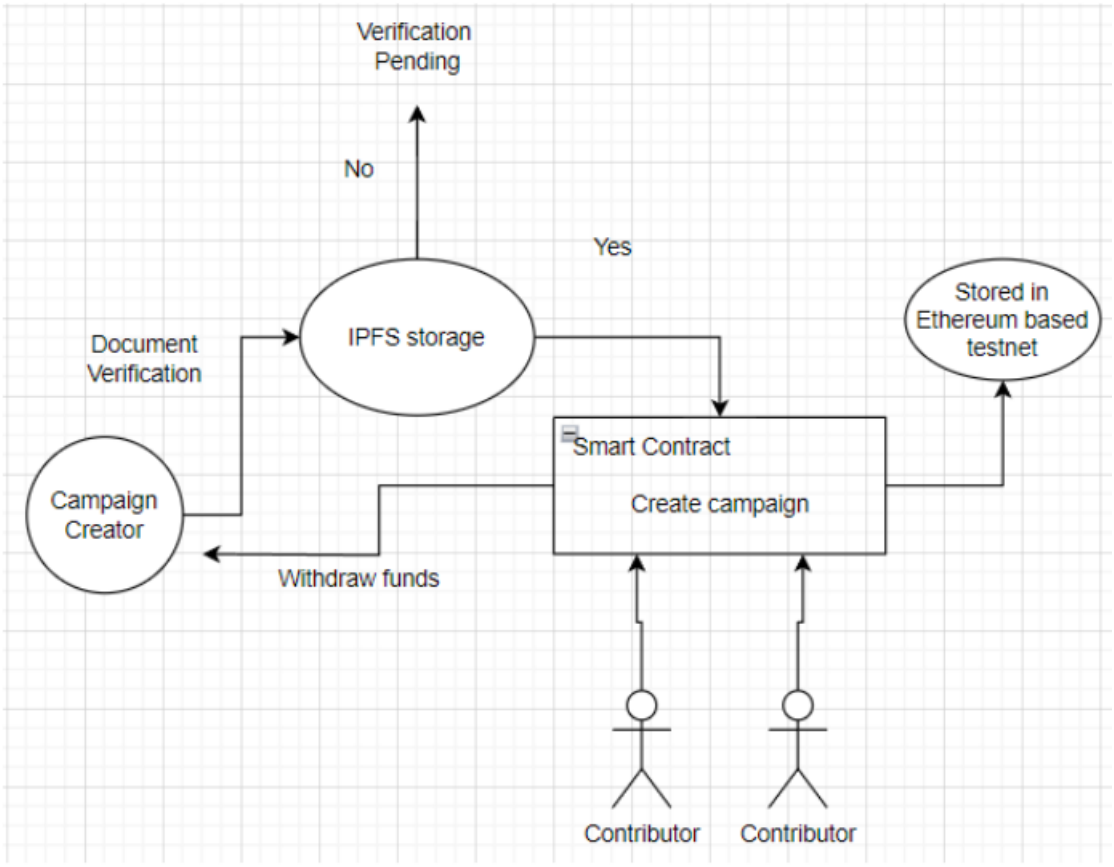

Figure 3.1: Functionality flowchart

3.5.2 Timeline Chart

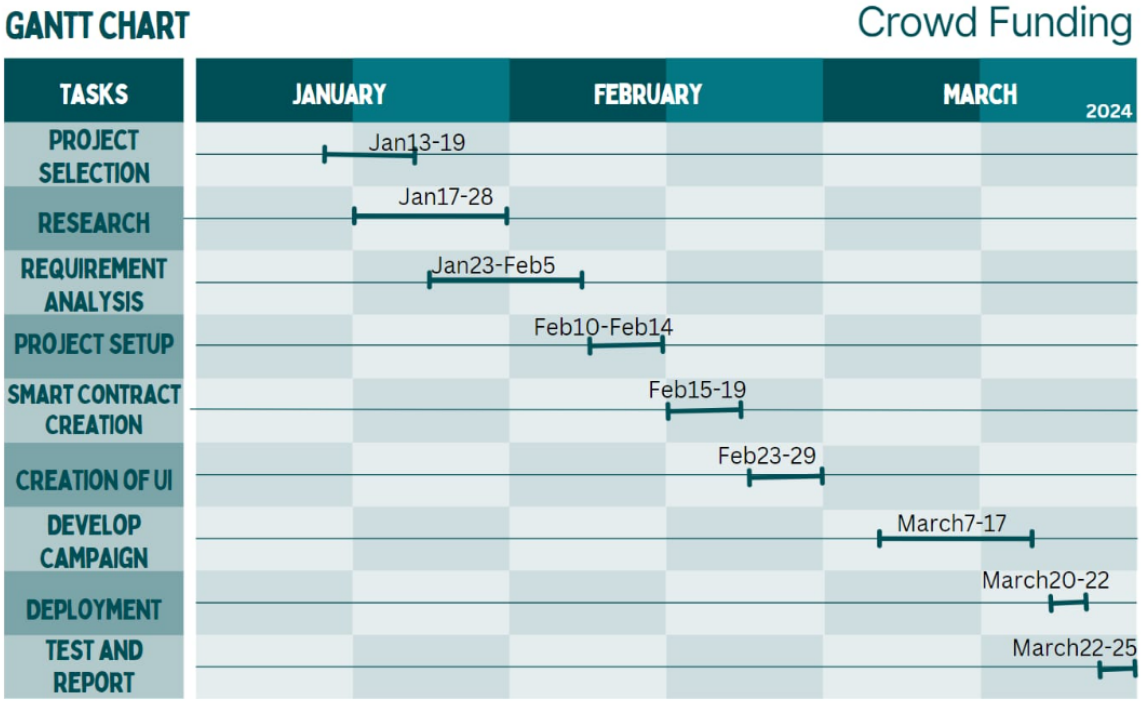

Figure 3.2: Timeline chart

3.6 Algorithm

1. Campaign Creation:

   Campaign creators initiate the campaign creation process by providing project details, funding goals, and setting the duration of the campaign. The platform verifies and validates the campaign details, ensuring they meet specified criteria and regulatory requirements. Upon successful validation, the campaign is created, and a unique campaign ID is generated, associating it with the creator's account.

2. Donation Mechanism:

   Donors browse through active campaigns and select the ones they wish to support. Upon selecting a campaign, donors specify the amount of cryptocurrency they want to contribute and initiate the donation process. Smart contracts facilitate the donation process, executing secure transactions on the blockchain. Donations are recorded on the blockchain under the respective campaign's ID, ensuring transparency and immutability.

3. Decentralized Wallet Integration:

   Users connect their decentralized wallets to the platform, allowing for secure management of funds. Wallet integration enables users to check their account balances, view transaction history, and initiate fund transfers seamlessly.

4. Campaign Duration Enforcement:

As campaigns are created, the platform tracks the specified duration set by the campaign creators. Once the campaign duration expires, the platform automatically stops accepting donations for the campaign. Donors attempting to contribute to expired campaigns are notified that donations are no longer accepted.

5. User Authentication:

   The platform implements robust user authentication mechanisms to verify user identities and protect account access. Users are required to log in securely using their credentials or decentralized wallet authentication methods before accessing platform functionalities.

6. Transparency and Accountability:

   All transactions, including campaign creation, donations are recorded transparently on the blockchain. All transactions can be viewed and verified on etherscan. Users can access real-time updates and track the progress of campaigns, ensuring accountability and visibility into fund allocation.

3.7 Cost Estimation

All the tools and software that are used in developing the blockchain based crowd funding dApp are all free of costs. This project is built using libraries.

3.8 Feasibility Study

Economic Feasibility
In terms of economic feasibility, the decentralized crowd funding project demonstrates a favorable outlook. The technology stack employed, including the react library, web3 js library and associated packages, comes at minimal to no cost. The primary investments are directed toward the allocation of time and effort from the development team. As a result, the system proves to be highly economical, requiring minimal financial resources for its development and deployment.

Operational Feasibility
The operations feasibility of this project appears promising, given the availability of technologies such as React, Solidity, and Web3 for frontend development, smart contract deployment, and blockchain interaction, respectively. The integration of decentralized wallets further enhances the feasibility by enabling secure connectivity and fund management. Additionally, utilizing the Ethereum-based Sepolia testnet offers a sandbox environment for testing and refining the platform without incurring real-world costs. However, ensuring scalability, regulatory compliance, and user education will be critical considerations to address potential challenges and ensure the long-term viability and success of the project.

Technical Feasibilty
The technical feasibility of this project is high, primarily due to the availability of well-established technologies and frameworks such as React for frontend development, Solidity for smart contract programming, and Web3 for blockchain interaction via RPC. These technologies provide robust tools and libraries that streamline the development process and ensure compatibility with blockchain platforms like Ethereum. Additionally, the use of the Sepolia testnet allows for safe testing and validation of smart contracts and platform functionalities without incurring real-world costs. However, technical challenges may arise in ensuring scalability, optimizing performance, and addressing potential security vulnerabilities inherent in blockchain-based systems.

Chapter 4

Results and Discussion

4.1 Software Results

The software results are as follows:

1. Functional Crowdfunding Platform: The software would provide a fully functional decentralized crowdfunding platform where users can create campaigns, donate cryptocurrency, and track fund allocation transparently.

2. User Authentication and Wallet Integration: Users would be able to securely authenticate their identities and connect their decentralized wallets to manage their funds seamlessly within the platform.

3. Smart Contract Execution: Smart contracts deployed on the Sepolia testnet would facilitate secure and transparent execution of transactions, including campaign creation, donation processing, and fund disbursement.

4. Campaign Duration Enforcement: The platform would enforce campaign durations, automatically stopping donations once the specified timeframe expires, ensuring campaign integrity and fairness.

5. Transparent Fund Management: All transactions, including donations and fund would be recorded transparently on the blockchain, providing accountability and visibility into fund allocation. All the transactions are publically viewable on etherscan.

4.2 Screen Shots

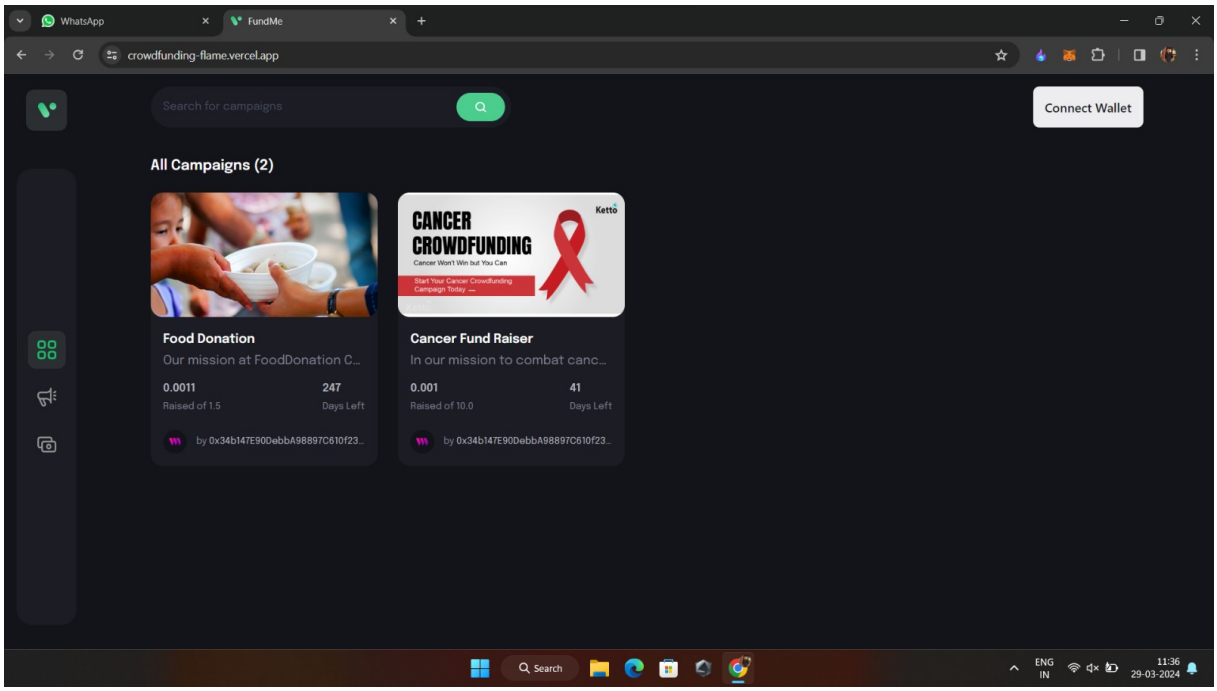

Figure 4.1: Home page

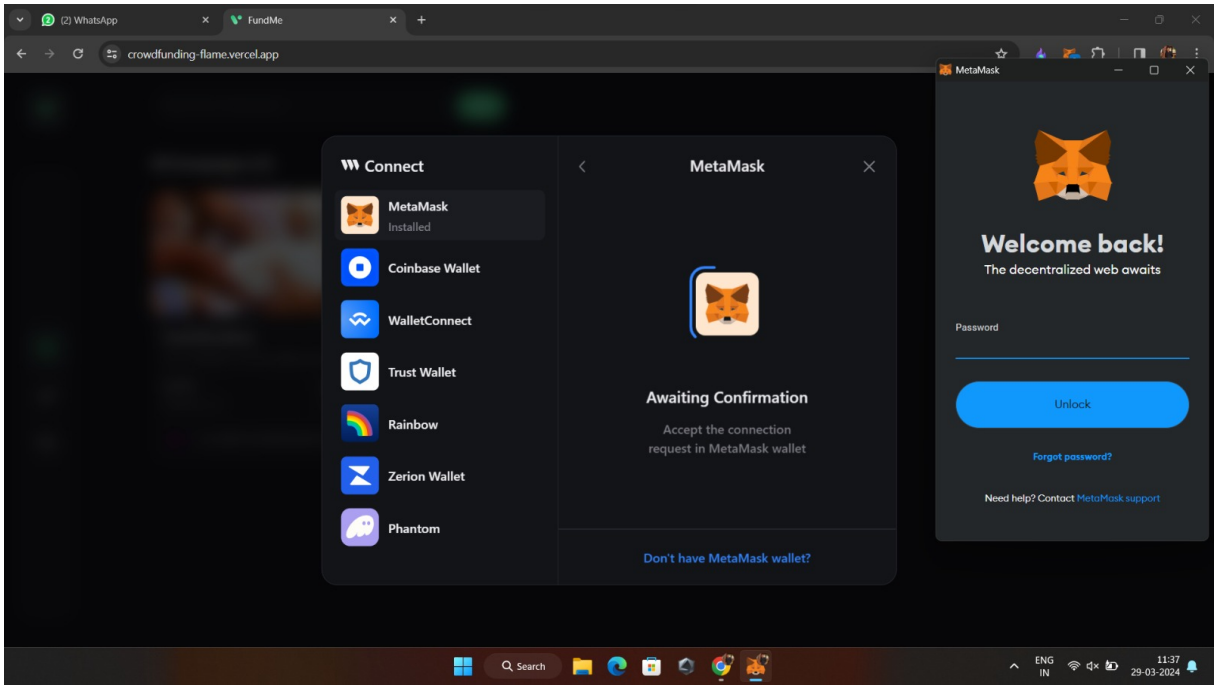

Figure 4.2: Login page

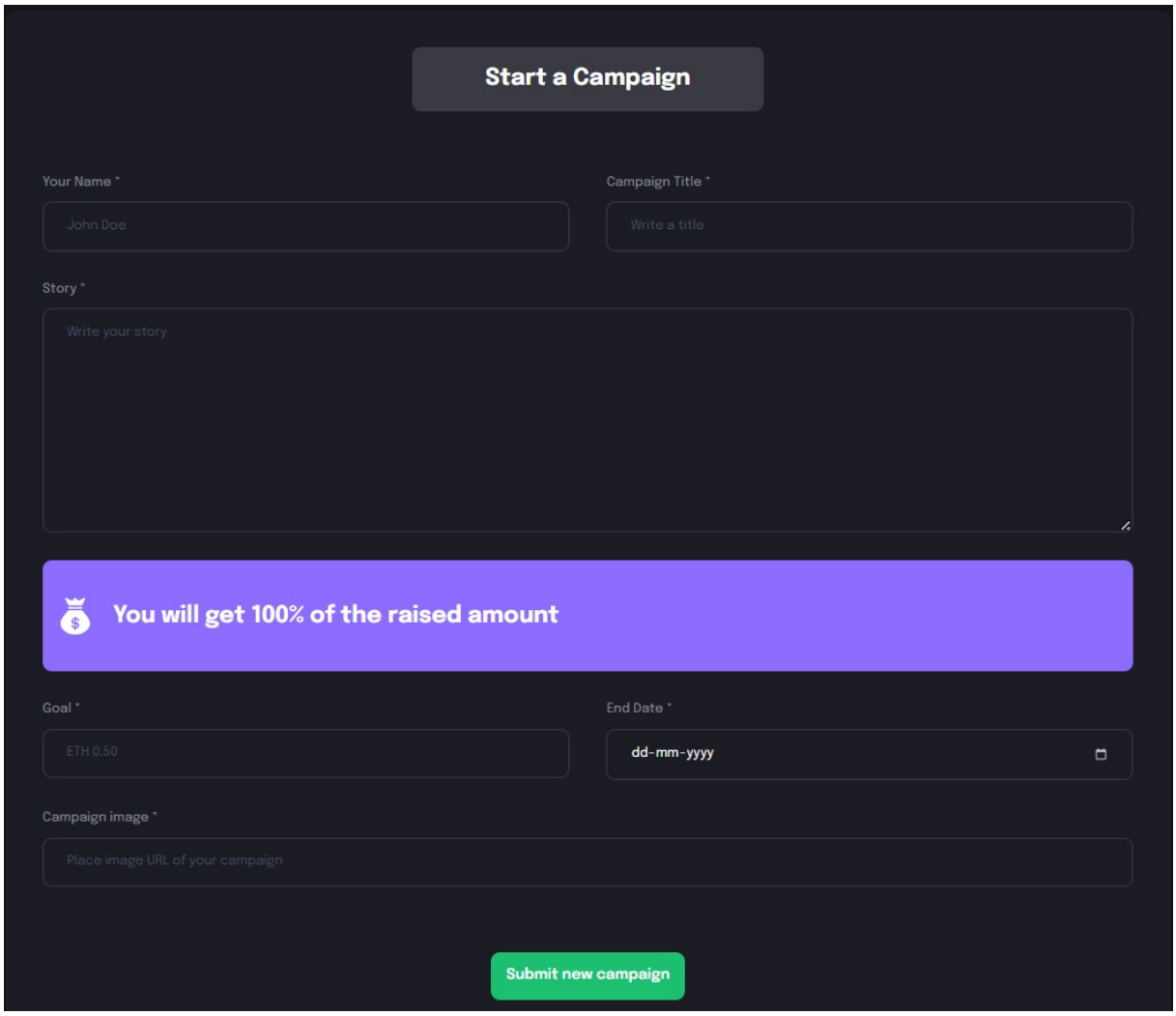

Figure 4.3: Campaign creation form

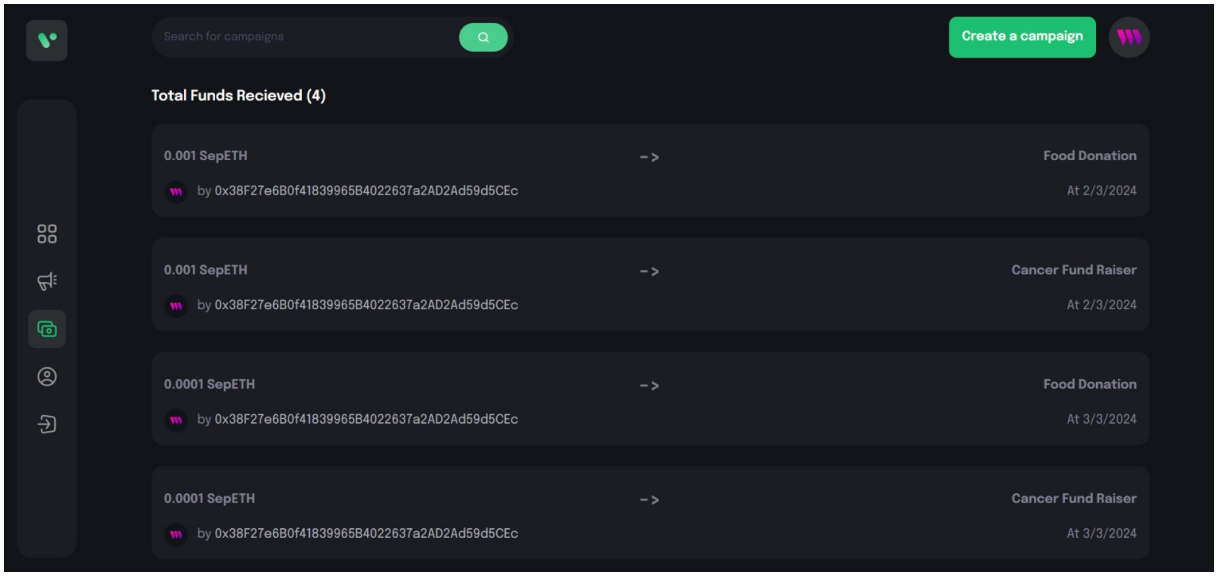

Figure 4.4: Fund history

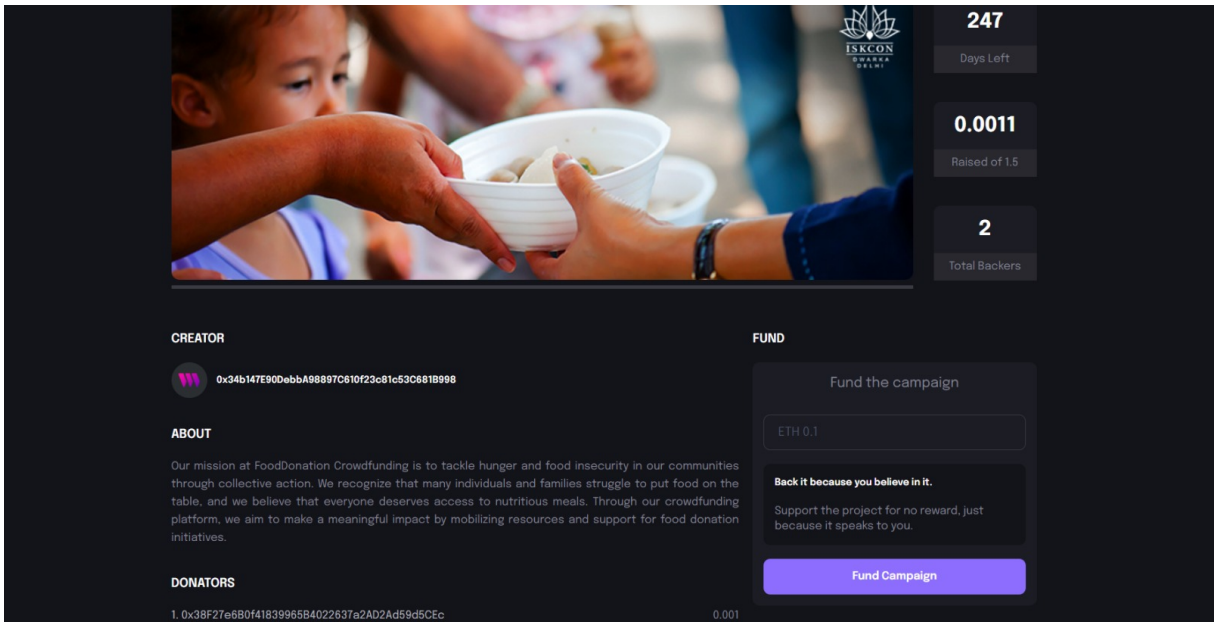

Figure 4.5: Campaign details

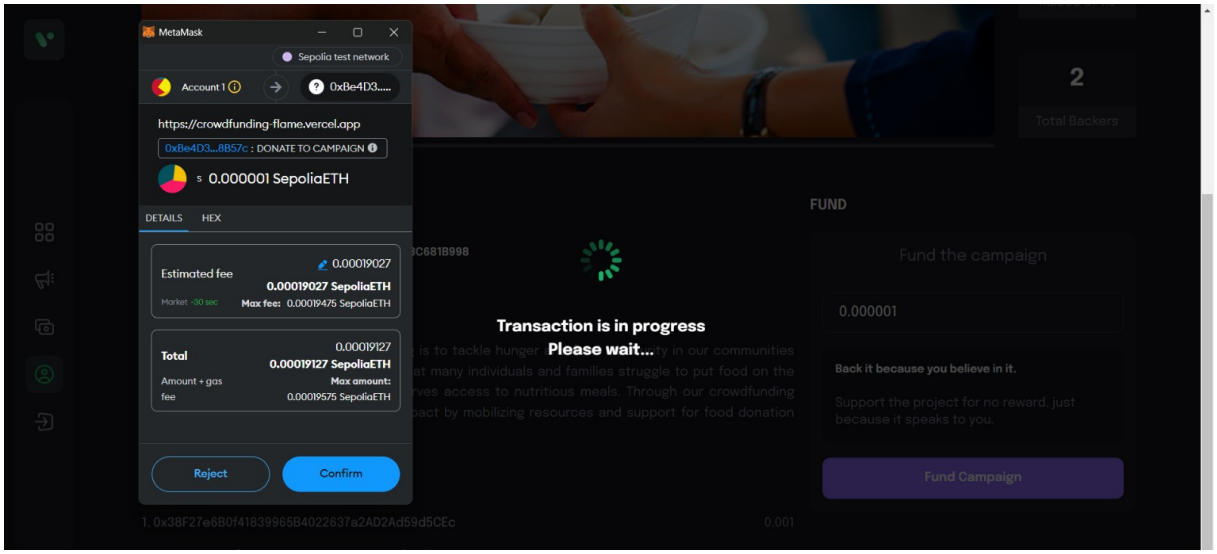

Figure 4.6: Transactions page

Chapter 5

Conclusion

5.1 Summary

The proposed project aims to develop a decentralized crowdfunding platform leveraging blockchain technology, with smart contracts deployed on the Ethereum-based Sepolia testnet. Using React for the frontend, Solidity for smart contracts, and Web3 for blockchain interaction via RPC, the platform enables transparent, secure, and efficient crowdfunding transactions. Users can create campaigns, donate cryptocurrency, and track fund allocation seamlessly, with decentralized wallet integration ensuring secure fund management. Campaign duration enforcement, transparent fund management, and user authentication mechanisms enhance platform integrity and usability. While technical feasibility is high, scalability, regulatory compliance, and user education are critical considerations. Overall, the project promises to revolutionize crowdfunding by providing a transparent, secure, and inclusive platform for project funding and support.

5.2 Future Scope

1. **Advanced Smart Contract Functionality:**

   Incorporating advanced smart contract functionalities such as conditional payments, multi-signature wallets, and tokenization to enhance fundraising capabilities and project flexibility.

2. **Integration with Other Blockchain Networks:**

   Expanding platform compatibility by integrating with other blockchain networks beyond Ethereum, allowing for cross-chain interoperability and access to a broader user base.

3. **Partnerships and Collaborations:**

   Forming strategic partnerships and collaborations with other projects, organizations, and platforms in the blockchain and crowdfunding space to leverage synergies, expand user reach, and enhance platform functionalities.

References

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[2] Prof D. L. Falak, Soudagar Shanawaz, Jadhav Pranav, Katke Kajal, Shukla Utkarsh, "Crowd-Funding Using Blockchain Technology", Department of Computer Engineering, Ste's Sinhgad Academy of Engineering Kondhwa, India, 2022.