FUNDING PRISM

A Project Report

Submitted in partial fulfillment of the

Requirements for the award of the Degree of

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

By

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Seat Number : 27

Under the esteemed guidance of

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PROFORMA FOR THE APPROVAL PROJECT PROPOSAL

(Note: All entries of the proforma of approval should be filled up with appropriate and complete information. Incomplete proforma of approval in any respect will be summarily rejected.)

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CERTIFICATE

This is to certify that the project entitled, **" Funding Prism "**, is bona fide work of **MAZHAR IQBAL SOLKAR** bearing Seat No: **(27)** submitted in partial fulfillment of the requirements for the award of degree of MASTER OF SCIENCE in INFORMATION TECHNOLOGY from University of Mumbai.

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ABSTRACT

Crowdfunding is the most popular way to raise money for any cause, startup, or to help someone. However, traditional crowdfunding platforms are less secure, and there is no transparency regarding how the raised amount is utilized. A blockchain-based crowdfunding web app aims to increase contributors' trust by providing more transparency and security to the funding process. Instead of donating money directly to the campaign creator's account, the funds will be kept in a smart contract account. When the campaign creator wants to withdraw money from the smart contract, they have to inform contributors about how they are going to use the funds and make a withdrawal request. Only when more than 50% of the contributors approve their withdrawal request will they be able to withdraw the funds from the smart contract. This method of raising funds will increase contributors' trust in crowdfunding and establish healthy relationships between contributors and fundraisers.

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude and appreciation to all those who have contributed to the successful completion of my final year project, titled "**Funding Prism**." This project aimed to develop a platform that utilizes blockchain technology to revolutionize the crowdfunding process and enhance trust, transparency, and security for both project creators and backers.

First and foremost, I would like to thank my project supervisor Mr. Dhanraj Jadhav for their invaluable guidance, support, and expertise throughout the entire duration of this project. Their insightful feedback, encouragement, and commitment to excellence have been instrumental in shaping the project's direction and ensuring its successful completion. I am truly grateful for their mentorship and the valuable lessons I have learned under their supervision.

I would also like to extend my sincere appreciation to the faculty members of Sathaye College whose dedication to education and commitment to fostering an environment of learning have been crucial in shaping my academic journey. Their knowledge, expertise, and willingness to assist whenever needed have significantly contributed to the development and execution of this project.

Furthermore, I would like to acknowledge the support and cooperation received from my fellow classmates and friends who have provided assistance, insightful discussions, and encouragement throughout this project. Their input and collaborative efforts have helped me to overcome challenges and enhance the overall quality of the final product. I am deeply grateful to the developers and contributors of open-source blockchain frameworks and technologies, whose extensive work and documentation have provided the foundation for this project.

Finally, I would like to express my heartfelt gratitude to my family and loved ones for their unwavering support, patience, and understanding throughout this challenging yet fulfilling Finally, I would like to express my heartfelt gratitude to my family and loved ones for their unwavering support, patience, and understanding throughout this challenging yet fulfilling journey. Their constant encouragement, belief in my abilities, and unconditional love have been the driving force behind my accomplishments.

DECLARATION

I here by declare that the project entitled, "**Funding Prism**", has not been in any case duplicated to submit to any other university for the award of any degree. To the best of my knowledge other than me, no one has submitted to any other university. The project is done in partial fulfillment of the requirements for the award of degree of **MASTER OF SCIENCE (INFORMATION TECHNOLOGY)** to be submitted as final semester project as part of our curriculum.

Name and Signature of the Student

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CHAPTER 1
INTRODUCTION

Crowdfunding has emerged as a transformative and innovative method for financing a wide range of ventures. Through crowdfunding, individual project creators can present their funding requests, providing a unique and creative approach to securing financial support for their initiatives. These initiatives encompass diverse objectives, spanning financial, cultural, or social realms. To effectively generate funds for these initiatives, online social media platforms have become integral in connecting investors and entrepreneurs, creating new pathways for fundraising and community engagement.

The advent of social media and the internet has played a pivotal role in revolutionizing the landscape of fundraising, particularly for nonprofit businesses and entrepreneurs. Leveraging these platforms, crowdfunding campaigns can reach a broader audience, tapping into a global network of potential supporters. This widespread access to information and connectivity has opened up unparalleled opportunities for fundraising and project promotion.

We can integrate blockchain technology into crowdfunding to further revolutionize the crowdfunding process, offering substantial benefits to both crowdfunding organizations and individual project creators. Blockchain-based crowdfunding platforms harness the power of decentralized networks and cryptographic protocols, introducing transparency, security, and trust into the fundraising process. As a result, these platforms elevate the credibility of initiatives and endeavors, attracting significant financing from investors and contributors.

Traditional crowdfunding platforms have limitations in terms of transparency, trust, and accountability. However, blockchain technology addresses these challenges by providing immutable records, enhanced security, and decentralized consensus. This has significantly raised the credibility of various crowdfunding campaigns, attracting a massive influx of financing from investors and contributors.

1.1 Background

Many tactics have been used by the government to handle government finances in order to combat the Covid-19 disease epidemic in the current circumstances. The community also decided to gather money in response to this circumstance to aid the government in combating the Covid-19 plague outbreak. In the process of raising funds, of course it is not easy, because it requires trust between many parties, both the funders, intermediaries or organisations as a place to store temporary funds to the recipient of funds.

That trust is the main capital for fundraising organisations to attract funders to donate their funds to recipients of funds. Numerous nonprofit organisations participate in fundraising efforts, particularly in light of the Covid-19 pandemic. Gaining contributors' trust is their biggest obstacle to raising money for the organisation. a nonprofit organisation that uses technology to simplify the process of receiving donations from donors.

Therefore, it can be inferred from this that technology also plays a significant part in obtaining as much funds as possible, in addition to trust, which is the key component. By integrating blockchain technology with crowdfunding platforms, we can boost funders' confidence, which will undoubtedly have an impact on the amount of money that fundraising organisations will be able to raise.

1.2 Objective

Focus of this project is to create an Ethereum blockchain based decentralised crowd funding application to bring trustability, transparency and security to the fund raising process by eliminating all the limitations of traditional crowdfunding platforms.

Main objectives are:

1. To increase contributors' trust in the crowdfunding process.
2. To provide transparency on how money is being used.
3. To keep record of all the transactions over the blockchain ledger.
4. To improve security as the fund becomes larger it requires greater security.

5. To enable global contribution.

1.3 Purpose

The most prevalent method of money collection is fundraising. Many organisations are gathering money to aid people and the government for the distribution of money to the people in need during the most critical times of COVID-19 and other natural calamities. Even for brand-new businesses, money is raised. Trust and security are crucial for those who are active in fund-raising. We might encounter numerous problems with trust and a lack of transaction transparency while using the traditional way of fund-raising.

Anyone who has access to the donated funds can readily engage in malicious activities. In order to address this issue, our project will offer greater security and transparency in an effort to win over additional contributors. To guarantee that the money is received by an authorised organiser, each transaction is recorded in the blockchain network. If all requirements are satisfied, beneficiaries can easily get these payments thanks to smart contract technology. Blockchain technology and smart contracts are used to construct this project's fundraising platform.

1.4 Scope

The Blockchain based crowdfunding project aimed at developing an online crowdfunding platform which can be used for raising funds for charity, business and startups. It is developed to simplify the operational and managerial task as well as improve the trust of contributors. Also helps fundraising organisations develop healthy relationships by providing transparency as everyone shares the same public ledger where all the transactions are recorded. The system provides startups a platform where they can pitch their ideas and people who find those ideas revolutionary can donate. Fundraisers can only withdraw money when more than 50% contributors give a positive response on their withdrawal request.

1.5 Applicability

The flexibility and effectiveness of few well-known crowdfunding platforms, including Kickstarter and Indiegogo, have revolutionised the startup industry. The development of crowdfunding platforms using blockchain technology may be the next step in the revolution of crowdfunding platforms.

The main problems with these well-known crowdfunding platforms are that they are centralised organisations under the control of a company that charges hefty fees and manipulates campaigns. This approach can be aided by blockchain-based crowdfunding platforms that decentralise the fundraising paradigm used by organisations like Kickstarter and others.

The distributed ledger of the blockchain assists in eliminating centralised intermediaries like Kickstarter and Indiegogo that take significant sums of money from campaigns as maintenance fees. Blockchain crowdfunding is a more pure form of the practice because it does not use any middlemen to connect backers and startups.

Creators can post their campaigns on crowdfunding dapps and then ask a community of potential donors for money. Additionally, blockchain eliminates the influence and manipulation practised by centralised crowdfunding sites that have greater access than necessary to the campaigns that are being conducted on their platform.

CHAPTER 2
REVIEW OF LITERATURE

Case Study 1

Title: Crowdfunding Platform Using Blockchain Technology

Research by: Dr. R. Senthamil Selvi1, Surya Prakash, Vishnu, Priyadharsan, PrasannaVenkateswara

Reference: https://ijirt.org/master/publishedpaper/IJIRT155716_PAPER.pdf

Review on Case Study 1

The most popular strategy for obtaining money for various social problems and endeavours has been fundraising. The issues and difficulties with traditional fundraising require consideration. The benefits of blockchain have produced smart contract technology as well as a safe channel for funder and campaigner communication.Decentralisation is provided through blockchain.

The smart contract will not be under the control of any one member of the network. No one in the peer-to-peer network can change the data on the blockchain, making the crowdfunding process secure, safe, and transparent because it is a peer-to-peer network. On the Internet, anyone with a need can post their information. Anyone who wishes to help may do so as required. Following verification, every transaction is added to the blockchain network.

The blockchain concept is used to manage all transactions, and all transactions are documented. The amount is stored in blocks that make up a blockchain, so a third party is not required. As in the case of crowdfunding in the traditional sense, the backer does not have to worry about the money being transferred to an authorised fundraiser.

Case Study 2

Title: Blockchain Based Smart Contract: Comprehensive Study

Research by: *1Research Student, Department of Computer Science, Jagan Institute of Management Studies, Sector-5, Rohini, Delhi, India. *2 Associate Professor, Department of IT, Jagan Institute of Management Studies, Sector-5 Rohini, Delhi, India.

Reference:

https://www.irjmets.com/uploadedfiles/paper/volume3/issue_5_may_2021/9847/1628083394.pdf

Review on Case Study 2

A peer-to-peer, decentralised, distributed, and continuously increasing immutable ledger made up of a linked chain of records is known as a blockchain. The records individually are referred to as events or transactions, while the sets of records collectively are referred to as blocks. A smart contract deployed on a blockchain network is comparable to a legal bond.

An agreement between two untrusted parties can be facilitated and carried out through the use of a smart contract, which is self-executing and self-enforcing code that runs on the blockchain. A further application of distributed ledger technology is smart contracts. Smart contracts serve as decentralised programmes on the blockchain network.

The program is immutable, and its immutability has been cryptographically validated to ensure the program's trustworthiness. The execution of smart contracts in peer-to-peer mode without the presence of a centralised third party and service availability without any centralised dependence are two of their most important features.

Case Study 3

Title: Blockchain Technology, Bitcoin, and Ethereum: A Brief Overview

Research by: Dejan Vujičić, Dijana Jagodić, Siniša Ranđić Faculty of Technical Sciences in Čačak University of Kragujevac Čačak, Serbia

Reference:
https://www.researchgate.net/publication/324791073_Blockchain_technology_bitcoin_and_Ethereum_A_brief_overview

Review on Case Study 3

Bitcoin is a type of virtual currency known as a cryptocurrency that was created to serve as money and a means of payment independent of any single person, group, or entity, eliminating the need for third parties to get involved in financial transactions. It is available for purchase on numerous platforms and is given to blockchain miners as compensation for their efforts in verifying transactions. By utilising the pseudonym Satoshi Nakamoto, an unidentified developer or group of developers presented Bitcoin to the general public in 2009. Ethereum is a blockchain with a Turing Complete programming language integrated into it. It offers an abstract layer that enables anyone to develop their own standards for ownership, transaction formats, and state transition procedures. Smart contracts, a collection of cryptographic rules that only take effect when specific requirements are met, are used to achieve this.

Case Study 4

Title: Blockchain-Based Crowdfunding: A ‘Pay-itForward’ Model of WHIRL

Research by: Dejan Vujičić, Dijana Jagodić, Siniša Ranđić Faculty of Technical Sciences in Čačak University of Kragujevac Čačak, Serbia

Reference: https://whirl.com/WHIRL_WP.pdf

Review on Case Study 4

Crowdfunding has revolutionised the way of raising funds for not only start-ups but for all traditional or existing businesses. Crowdfunding made it easy for fundraisers to raise funds as they don’t have to knock on doors of banks and financiers and get the desired amount in return of interest or offering equity or even through donation, or reward. Blockchain, on the hand, is decentralising the system of records and control which makes crowdfunding more transparent and secure. Though a number of blockchain-based crowdfunding platforms are already doing good business and they vary in crypto, model and type of crowdfunding. The study is conducted on a very new blockchain-based crowdfunding platform, WHIRL. The unique and different in this model is the model, “pay-it-forward” itself. The model assures that members will get their legit project funded after they help other projects succeed. The study also highlights some thoughts from the Executive Board of Directors and co-founders after doing a brief discussion with them.

Case Study 5

Title: Decentralised application for crowdfunding using blockchain technology

Research by: H.L. Gururaj, V. Janhavi, Abhishek M. Holla, Ashwin A. Kumar and R. Bhumika

Reference: http://www.inderscience.com/storage/f256410837911121.pdf

Review on Case Study 5

Crowdfunding is a way for people, businesses, and charities to raise money. It works through individuals or organisations who invest in (or donate to) crowdfunding projects in return for a potential profit or reward. Investing this way can be risky. Security is the main challenging issue in crowdfunding contracts. Using existing literature on crowdfunding and blockchain technology, they put forward a conceptual framework that can provide the solution to the problems related to crowdfunding contracts using blockchain technology. This methodology points out the potential of crowdfunding decentralised applications to lower market inefficiencies by bypassing third parties and easing trades on secondary markets. This platform eliminates the interference of the middlemen. It is highly transparent and secure. A decentralised approach to crowdfunding forfeits all fees for the investor. It also gives a share of the project to the receiver. This model establishes a flexible platform for the fundraiser to start a campaign. The funders invest the amount if they feel the project to be genuine. Once 50% of the funds are received, it will be transferred to the initiator. It establishes a peer-to-peer relationship between the investor and the receiver.

Literature Review

H.L. Gururaj et al. (2021) addressed the earlier work that had been done in the field of crowdfunding. Crowdfunding is the most well-liked method of project financing in the modern world. A person or organisation might present the concept for their initiative. Additionally, those who believe this notion is legitimate will invest (Tomczak and Brem, 2013). However, the internet has increased accessibility to crowdsourcing. The first-ever crowdsourcing website, called "Artistshare," became live in 2003. Since then, a number of crowdfunding websites, including Indiegogo, Kickstarter, RocketHub, and Gofundme, have launched. Nowadays, one of the hottest sectors is crowdfunding (Chen, 2018). Crowdfunding comes in a variety of forms, including reward-based, donation-based, equity-based, and lending-based.

Dr. R. Senthamil Selvi et al. (2019) describe how blockchain technology might make crowdfunding safer and more transparent. Blockchain was initially primarily utilised as the basis for cryptocurrencies, but it has since developed into a brand-new, rapidly-emerging technology that is being employed in a variety of industries. Blockchain is anticipated to be included into the majority of technologies as an effective way to conduct online transactions in the future. The problem with today's crowdfunding model is that contributors and third-party middlemen have no control over the money they provide. This study introduces a blockchain-based crowdfunding network that, by utilising Ethereum smart contracts, may offer a private, secure, and decentralised crowdfunding path.
The main objective is to make it possible for donors to make effective contributions to any campaign anywhere in the world by using Ethereum and developing smart contracts that give donors control over the Ethereum they spend. This will also make it possible for campaign creators and donors to make and reserve financing for their project or campaign. The goal is to apply Ethereum smart contracts to the crowdfunding platform in order to fully automate the execution of the contracts, thereby resolving these issues and fostering positive relationships between the platform, the fundraisers, and the contributors.

Baber (2019) came up with WHIRL, a blockchain-based platform for crowdsourcing. A pay-it-forward economic concept, which is at the foundation of WHIRL, aims to create a positive feedback loop of kindness and giving. By using the "pay it forward" approach, everyone who

starts a campaign is guaranteed to have made their dues. WHIRL clearly distinguishes itself from other crowdfunding platforms thanks to this principle. Campaigns on every other site must keep their promises to their backers. They have already completed their obligation to support other projects by supporting WHIRL. Simple: if you push everyone up, you will have the opportunity to go up and those who follow you will also push themselves up. A user can join up for two things: first, to purchase WRL, the company's own cryptocurrency, and second, to directly support a project with fiat money or another cryptocurrency. WHIRL, in contrast to most sites, allows a wide range of currencies. According to rumours, WHIRL will soon support more than twelve different cryptocurrencies.

Dejan Vujičić et al. (2018) explained Bitcoin and Ethereum in detail, Bitcoin is a type of virtual currency known as a cryptocurrency that was created to serve as money and a means of payment independent of any single person, group, or entity, eliminating the need for third parties to get involved in financial transactions. It is available for purchase on numerous platforms and is given to blockchain miners as compensation for their efforts in verifying transactions. By utilising the pseudonym Satoshi Nakamoto, an unidentified developer or group of developers presented Bitcoin to the general public in 2009.

CHAPTER 3

METHODOLOGY/APPROACH

3.1 Problem Definition

One of the most well-liked methods of raising money for a project, a cause, or to assist someone in need is through crowdfunding. Since the launch of Covid, there has been an increase in crowdfunding initiatives all over the world, from tiny initiatives to provide oxygen and medical assistance to large initiatives like PM Cares.

We aimed to address the following fundamental problems with the current crowdfunding platforms

1. **Security:** As the funds become larger, they need to be heavily secure, as blockchain is distributed immutable database so if someone tries to hack our platform he have to hack more than 50% nodes on blockchain network at the same time which is very difficult as in real world we have millions of nodes in blockchain network.

2. **Transparency and anti-fraud measures:** Scams involving crowdfunding have been reported frequently and continue to do so. There is no way to track how the money is being spent. In order to prevent the risk of money being misused, we needed to make the entire flow of funds public at every point.

3. **Global contribution:** Because some platforms are nation-specific, it might be challenging for people from other nations to support various causes. Anyone in the globe can contribute to the campaign using blockchain technology. Transactions are efficient and practical.

3.2 Requirement Specification

Crowdfunding platform is used to collect funds from individuals and then those funds are used for charity, business or startups. We are creating a blockchain based decentralised crowdfunding platform. The main goal of this system is to make the fundraising process simple, secure and transparent.

3.2.1 Functional Requirements

1. fundraiser can create a campaign.
2. Users can filter the campaigns based on their types.
3. users can contribute to the campaign.
4. fundraiser can make a withdrawal request.
5. contributor can approve or reject withdrawal request
6. fundraisers can withdraw money, when more than 50% contributors approve withdrawal requests.

3.2.2 Non-Functional Requirements

1. The primary non-functional need for a crowdfunding platform is usability. Everyone should be able to understand the user interface (UI) and find the necessary information without any extra training.
2. The system needs to be highly secure to prevent malicious attackers.
3. The system should be available all the time.
4. Another crucial non-functional necessity for the crowdfunding site is accuracy. The campaign-related data that is saved must be accurate, dependable, and consistent.

3.3 Software Requirements

1. **Ethereum blockchain:** Ethereum is built on blockchain technology, which enables programmers to run code on blocks. With Ethereum, we can create decentralised applications. The Blockchain network supports smart contracts, and its coin is called ether. We can build decentralised applications using Ethereum.

2. **Metamask:** Metamask is a browser extension which is a crypto wallet that is used for doing cryptocurrency transactions.

3. **Solidity:** Smart contracts are created using Solidity, a high level, statically typed programming language.

4. **React.js:** It is a javascript framework that allows us to break application into small components, these components help us to reduce code redundancy.

5. **Remix idle:** Solidity smart contracts are created using Remix, an integrated development environment (IDE). Remix development makes it simple for developers to track down issues and troubleshoot programmes.

6. **Third web:** With the goal of simplifying the work of developers, third web is a top-notch programming environment, testing framework, and asset pipeline for blockchains running on the Ethereum Virtual Machine (EVM). The most well-liked tool for creating blockchain applications is generally regarded as third web.

7. **Ganache:** In order to engage with smart contracts in your own private blockchain, you can replicate the Ethereum blockchain using Ganache, a private blockchain environment.

8. **VS Code:** Microsoft created the code editor known as Visual Studio Code. It is a feature-rich editor that helps developers create web applications by supporting code highlighting, code debugging, intelligent code completion, and code refactoring. It contains a built-in terminal for running commands from the command line.

3.4 Hardware Requirements

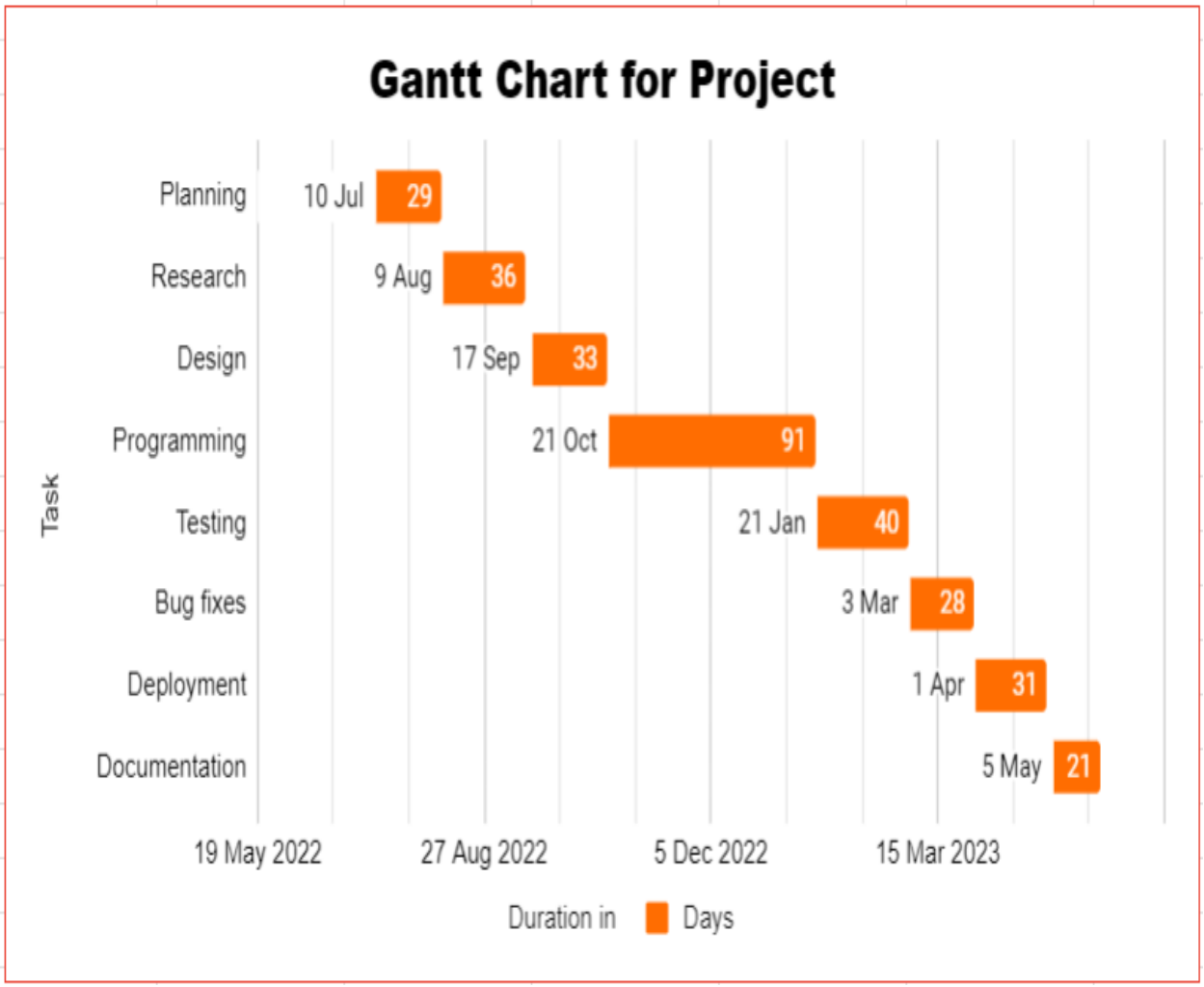
1. **Processor:** at least i3 10gen.
2. **Ram:** at least 4GB.
3. **Rom:** At least one HDD or SSD with 5GB free space.

3.5 Planning Schedule

3.5.1 Schedule Table

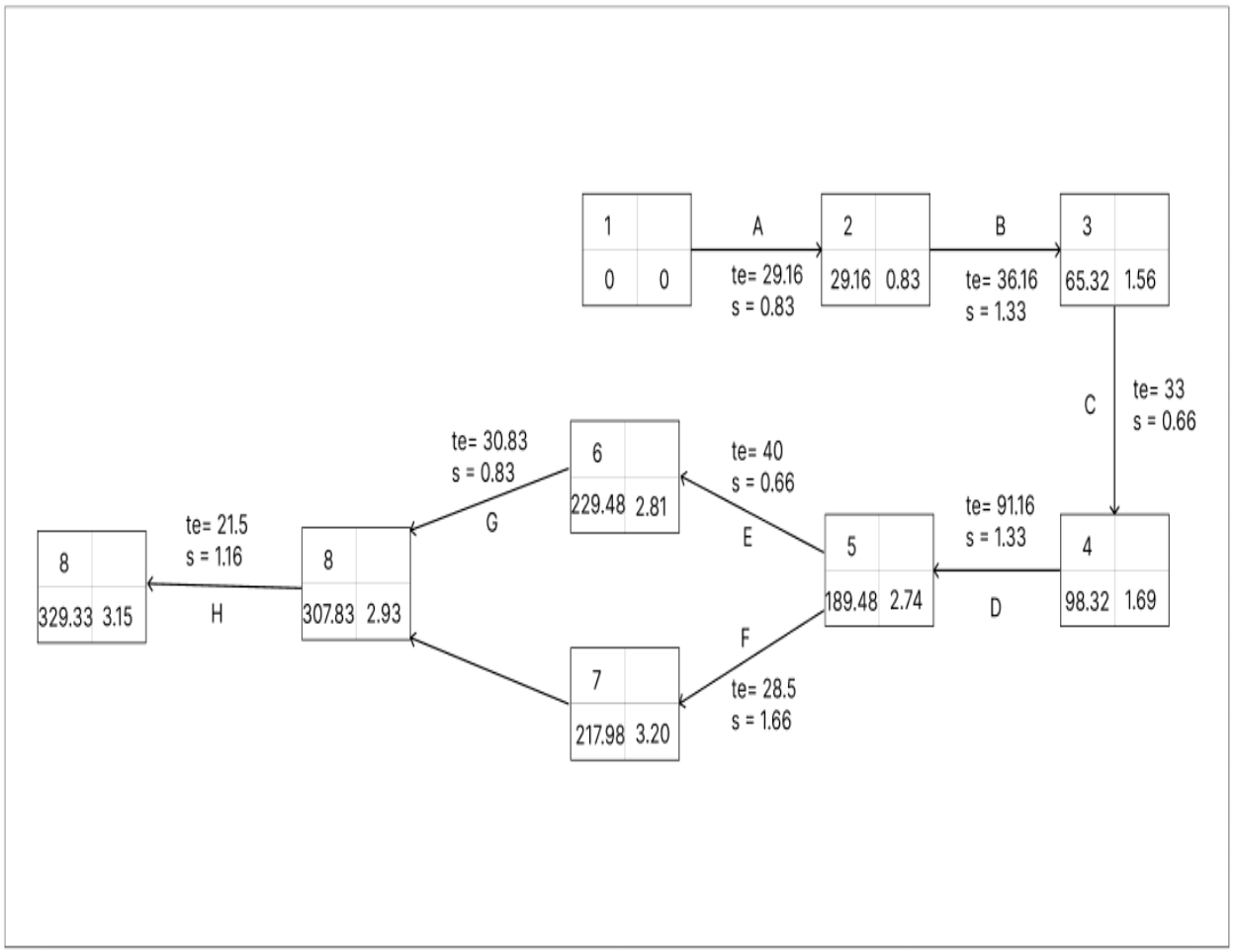
Task	Start Date	End Date	Days
Planning	10/07/22	08/08/22	29
Research	09/08/22	16/09/22	36
Design	17/09/22	20/10/22	33
Programming	21/10/22	20/01/23	91
Testing	21/01/23	02/03/23	40
Bug fixes	03/03/23	31/03/23	28
Deployment	01/04/23	05/05/23	31
Documentation	05/05/23	24/05/23	21

3.5.2 Gantt Chart



3.5.3 Pert Chart

Activities	Optimistic (a)	Most Likely (Duration in days) (m)	Pessimistic (b)	Expected Duration (te)	Standard Deviation (s)
Planning	27	29	32	29.16666667	0.8333333333
Research	32	36	40	36	1.333333333
Design	31	33	35	33	0.6666666667
Programming	85	91	98	91.16666667	2.166666667
Testing	38	40	42	40	0.6666666667
Bug fixes	26	28	33	28.5	1.166666667
Deployment	28	31	33	30.83333333	0.8333333333
Documentation	19	21	26	21.5	1.166666667



3.6 Preliminary product description

Crowdfunding platform helps us to quickly connect to a huge network of people by bringing campaign fundraising donors and organisers working together. The third party engagement comes with additional costs as most of the crowdfunding platforms are centralised. Blockchain has been used by numerous decentralised websites to provide peer-to-peer communication between the campaign organiser and the funder in order to solve this problem. Due to the benefits of blockchain, there is now a safe way for funders and campaigners to connect. Smart contract technology that makes it simple for campaigners to receive their funding after all requirements have been met. As a result, it makes it possible for donors to confidently support a project or cause that is free of fraud. Thus, by utilising blockchain in fundraising, we can alter the established method of raising money.

3.7 Methodology

The purpose of the system is to make the crowdfunding process transparent and secure. To accomplish this we are using ethereum blockchain, which is a distributed immutable ledger. We will keep the record of all transactions on this ledger. We will be using Next Js for frontend, solidity for writing smart contract and Web3 Js for combining frontend and backend.

The system is composed of four modules:

1. **Connect wallet:** It allows users to connect their crypto wallet for doing transactions. In blockchain transaction is not just transfer of cryptocurrency, it is transfer of data from one point to another. For doing any transaction you have to pay some amount of ether.

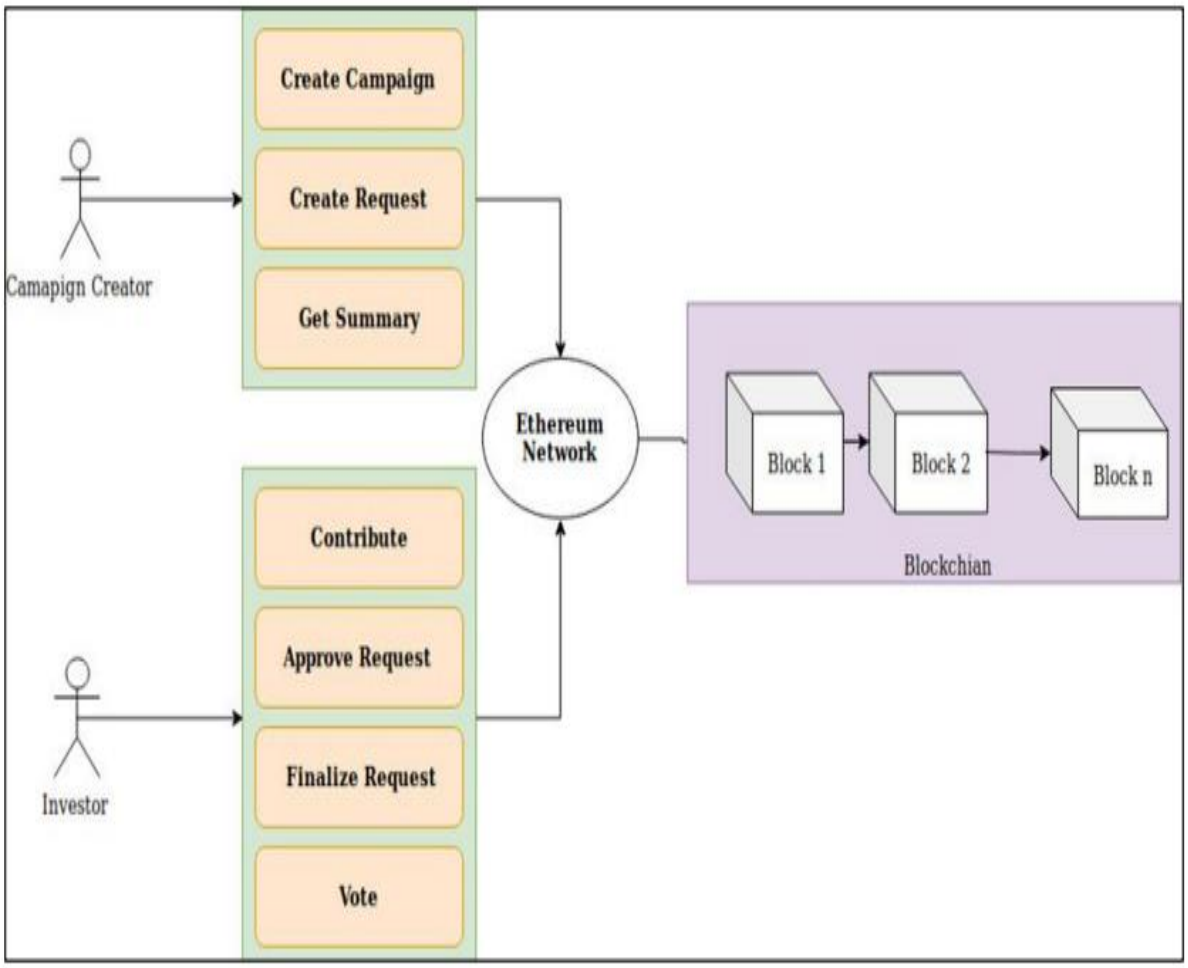
2. **Creating a Campaign:** Anyone can launch a campaign in a matter of minutes, A campaign can only be created after a few simple fields have been completed. The name of the campaign and a few phrases describing it must be provided by the campaign's author. The minimum donation amount and the campaign's target amount must be chosen by the campaign's author. The picture URL must be provided by the campaign's creator. Making a campaign-related graphic is ideal. Once the minimum contribution amount has been established, the contributor cannot make a contribution below it. The creator of the campaign must first connect their Ethereum wallet, which is the most important need.

They won't be able to create a campaign if they don't have an Ethereum wallet or if they haven't connected their Ethereum wallet with Metamask.

3. **Contributing to a Campaign:** Users can share campaigns they have established, and after they have been created, anybody can contribute to them. Contributor is directed to the campaign contribution page when he clicks on a campaign from the main page. On that page, you can see the campaign's name and description, the minimum contribution amount the campaign creator set, the wallet address of the campaign creator, the number of requests that have already been granted, the number of approvers or contributors that have contributed to the campaign thus far, and the current status of the funds raised. The donor will not be able to contribute to the campaign if he does not use a meta mask to connect his ethereum wallet. The contributor can view the campaign withdrawal requests before making a contribution. The process will be more effective and anti-fraudulent because the monies would be paid to the campaign address rather than the campaign creator.

4. **Withdrawal of Funds:** By submitting a Withdrawal Request on the website, the campaign's creator can suggest how the money should be used. They must provide a good justification for the required sum. They need to enter the Ethereum wallet address. The approvers have the authority to review the request description and decide whether or not to approve the requested amounts. The approvers have the option to reject the request. Funds cannot be removed without approvers' approval. Once all approvers have approved and finalised, the desired amount can be paid into the recipient's wallet.

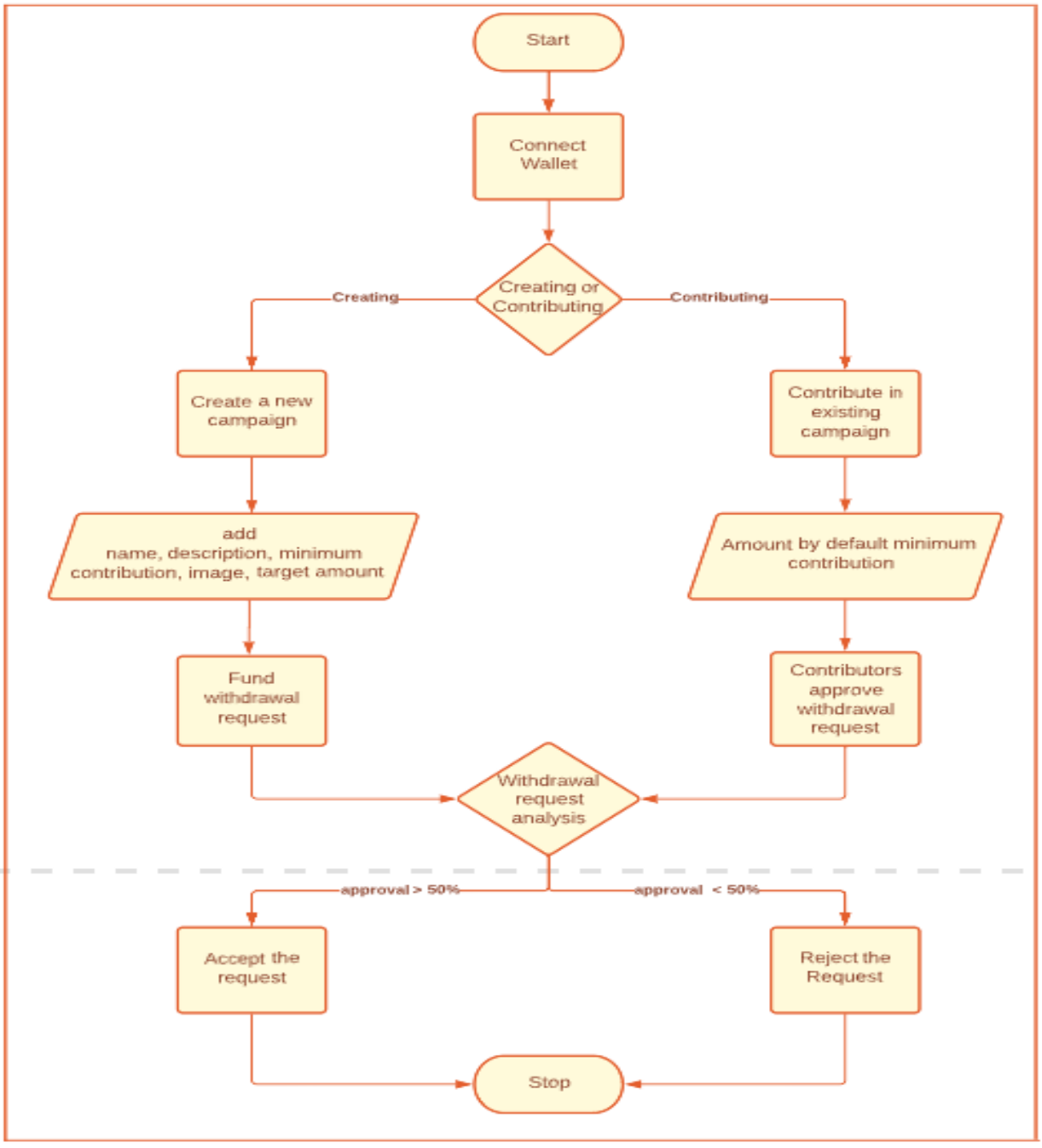
3.8 Conceptual Model



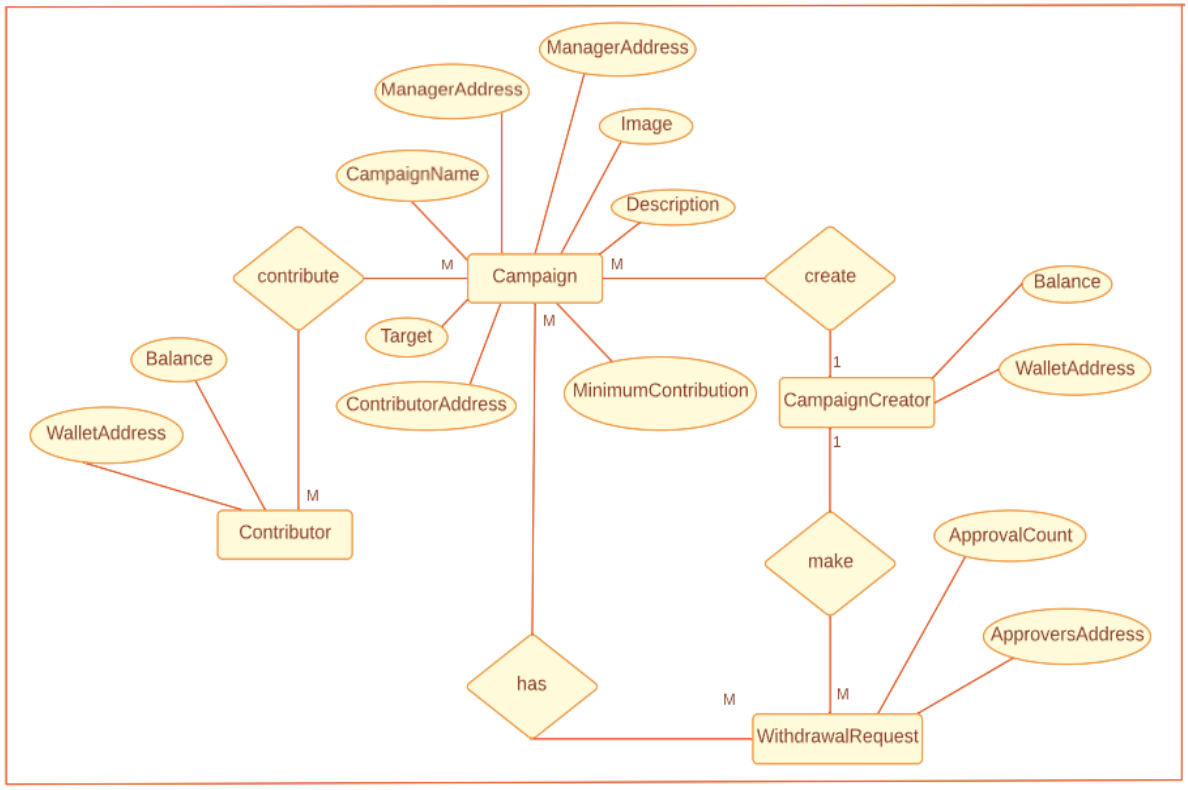
CHAPTER 4

UI DESIGN

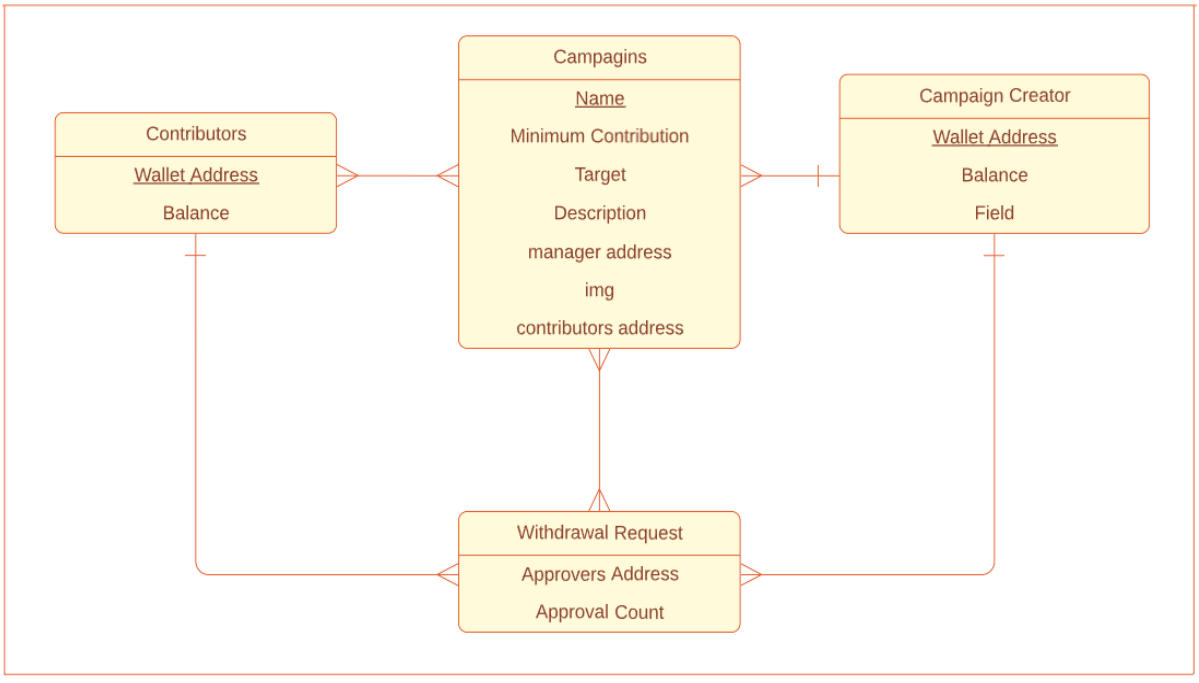
4.1 Flow of creating and contributing to campaigns



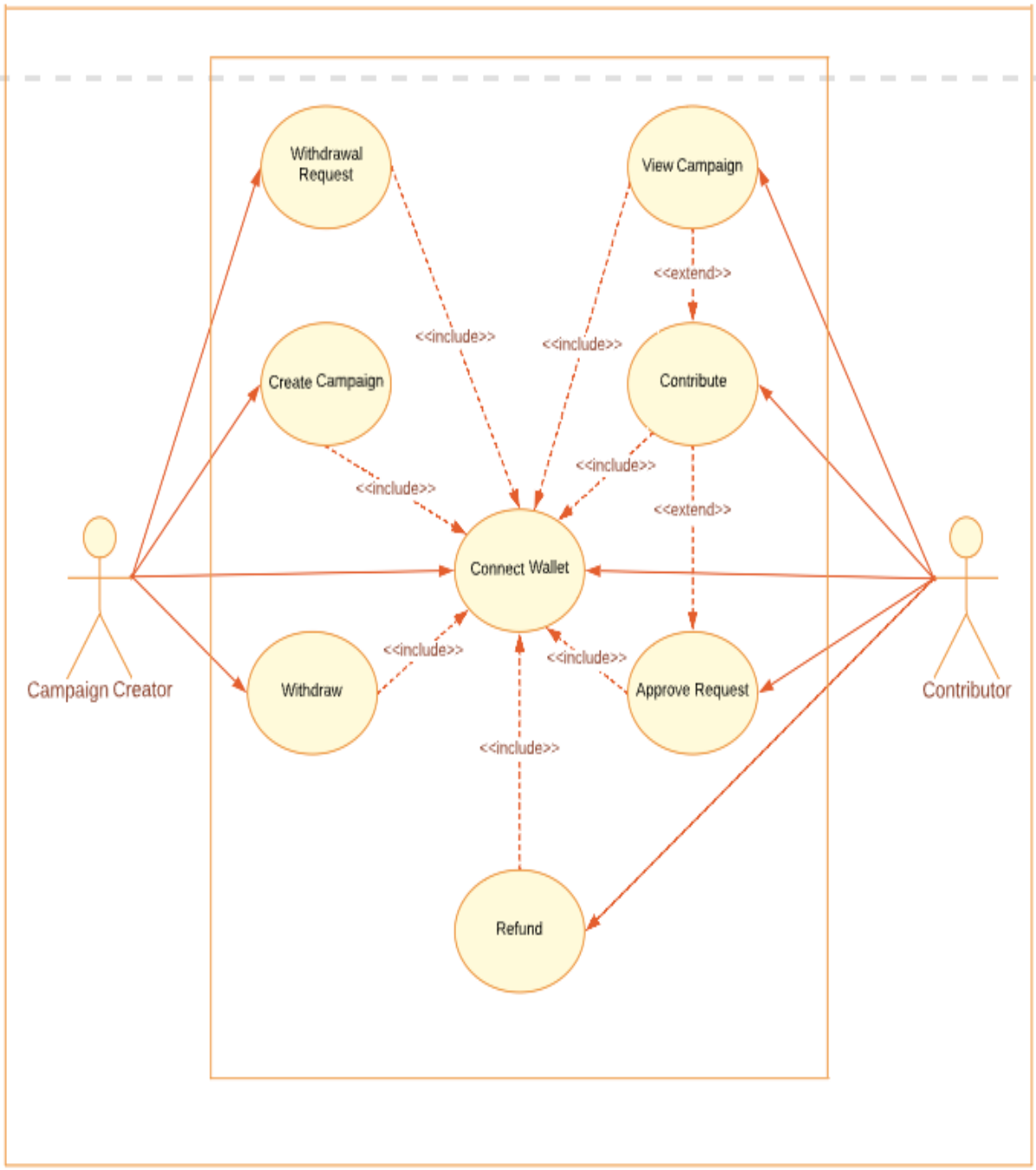
4.2 ER Diagram



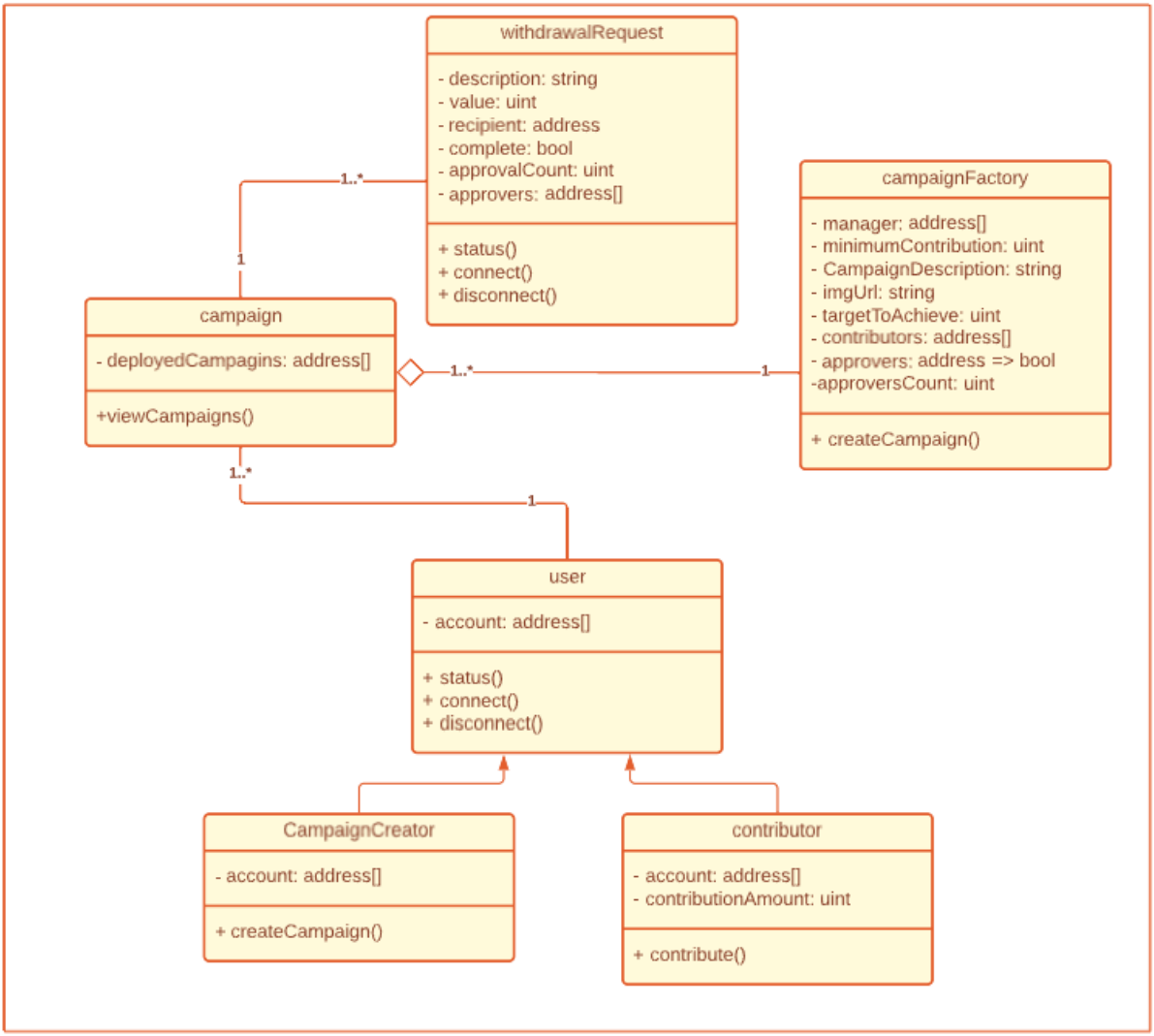
4.3 Data Design



4.4 Use Case Diagram

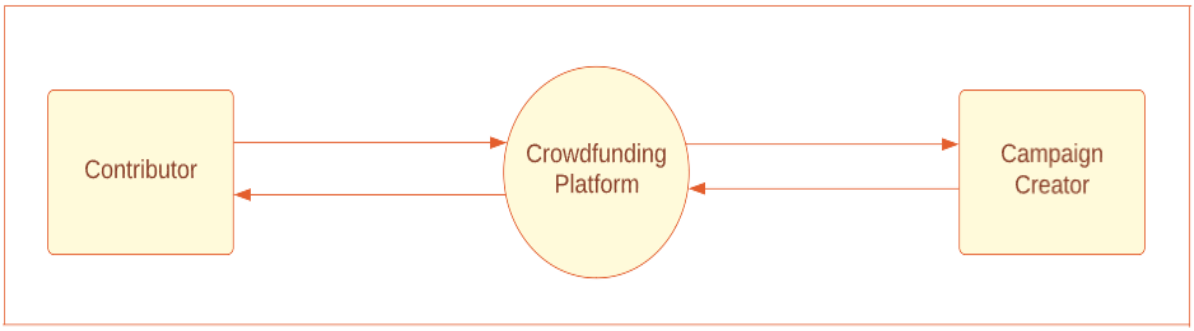


4.5 Class Diagram

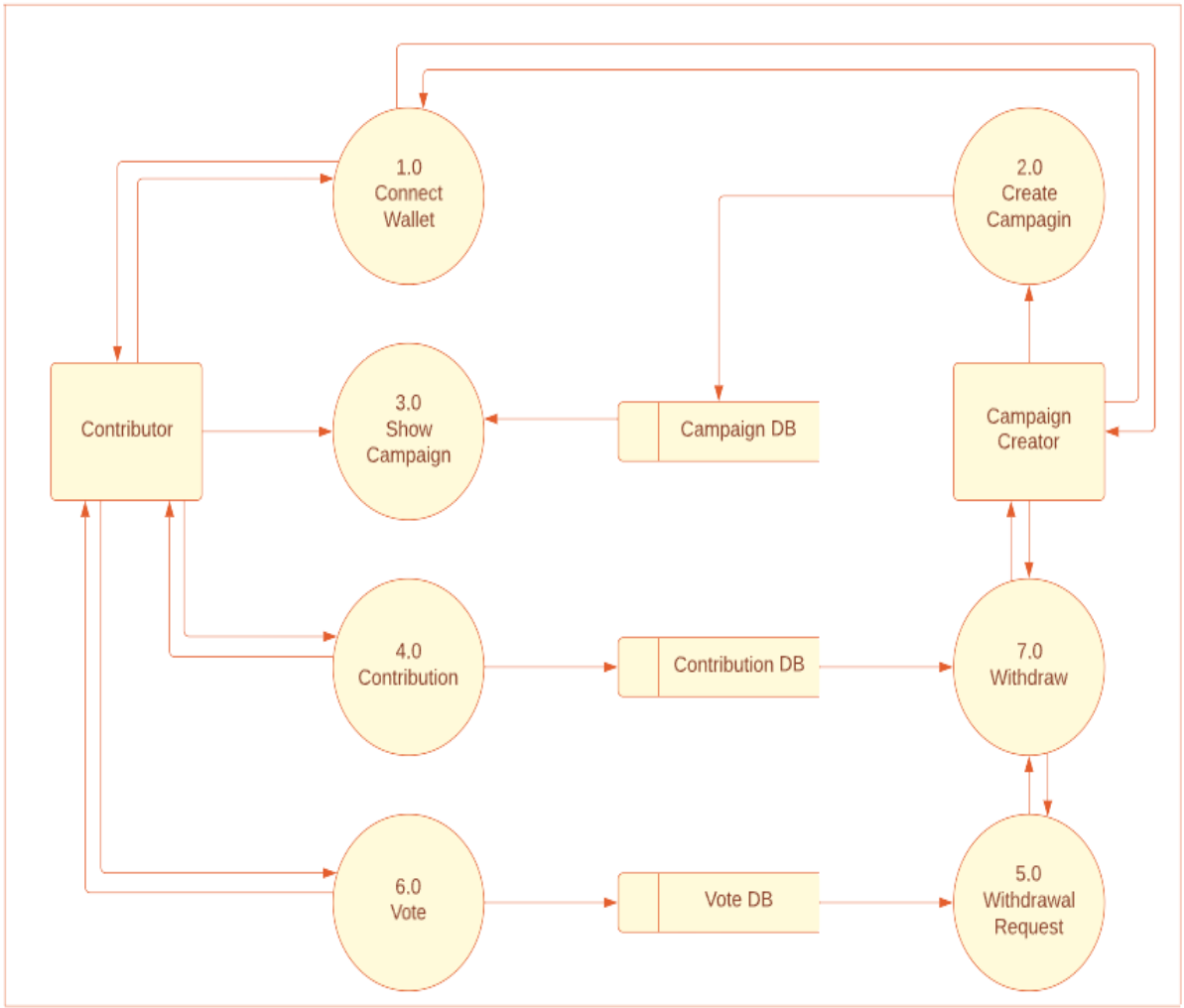


4.6 Data Flow Diagram

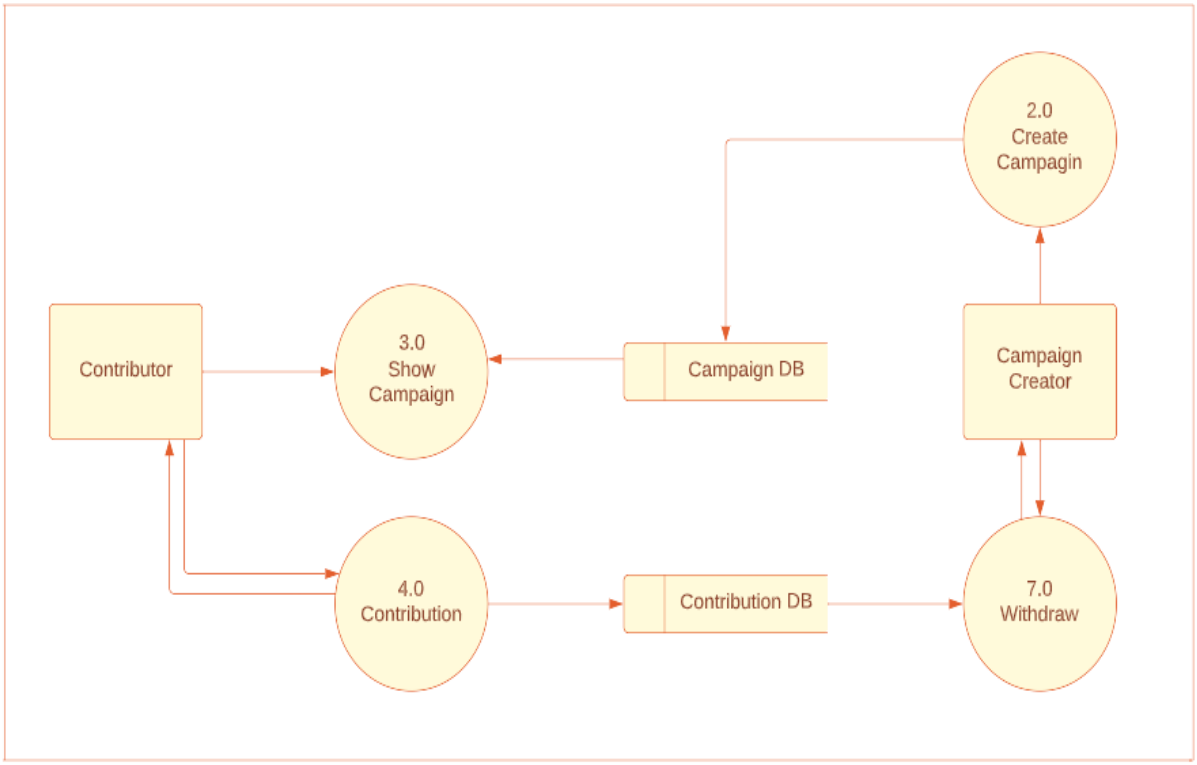
4.6.1 Level 0 DFD



4.6.2 Level 1 DFD

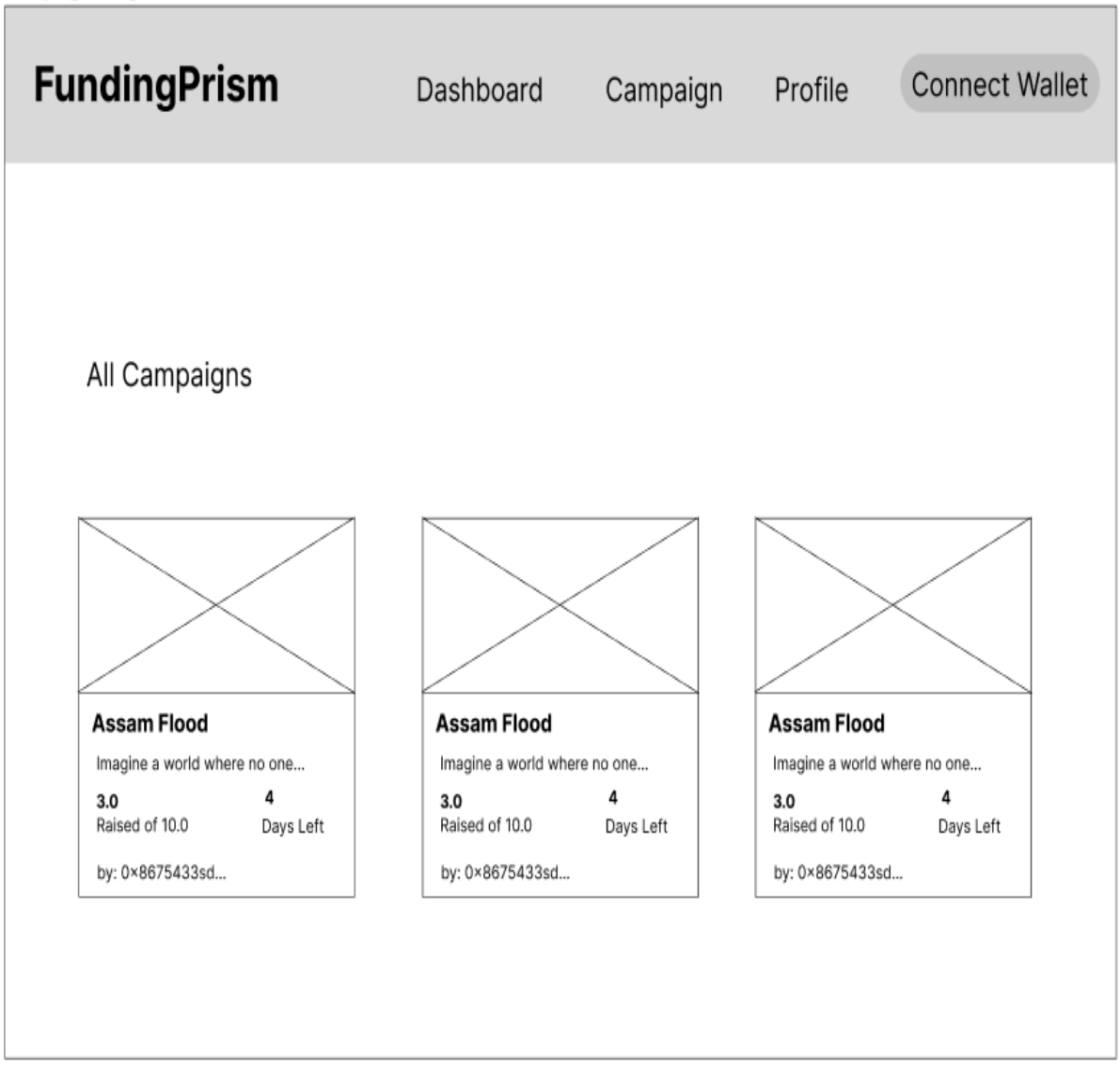


4.6.3 Level 2 DFD

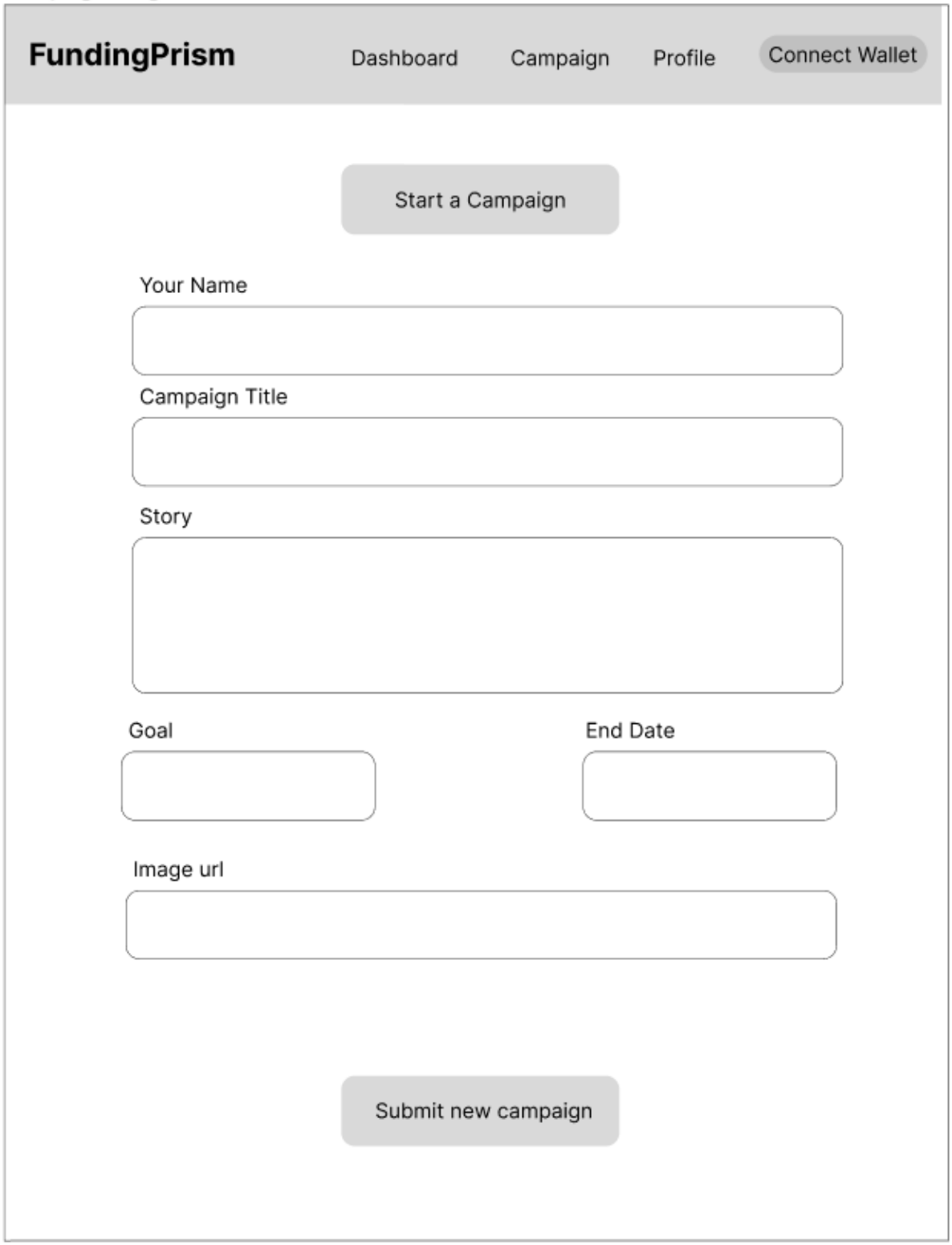


4.7 Wireframes

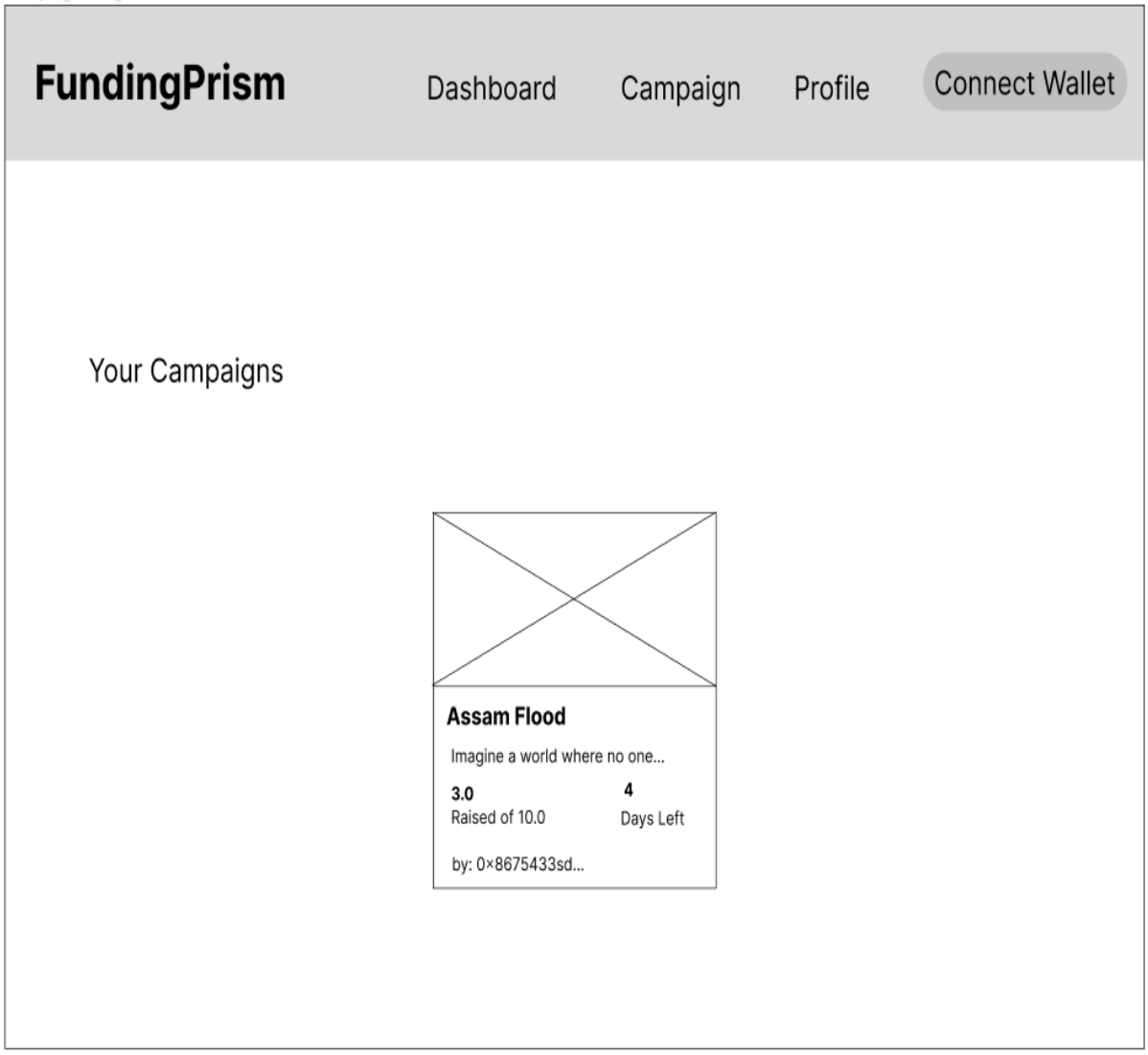
4.7.1 Dashboard Page



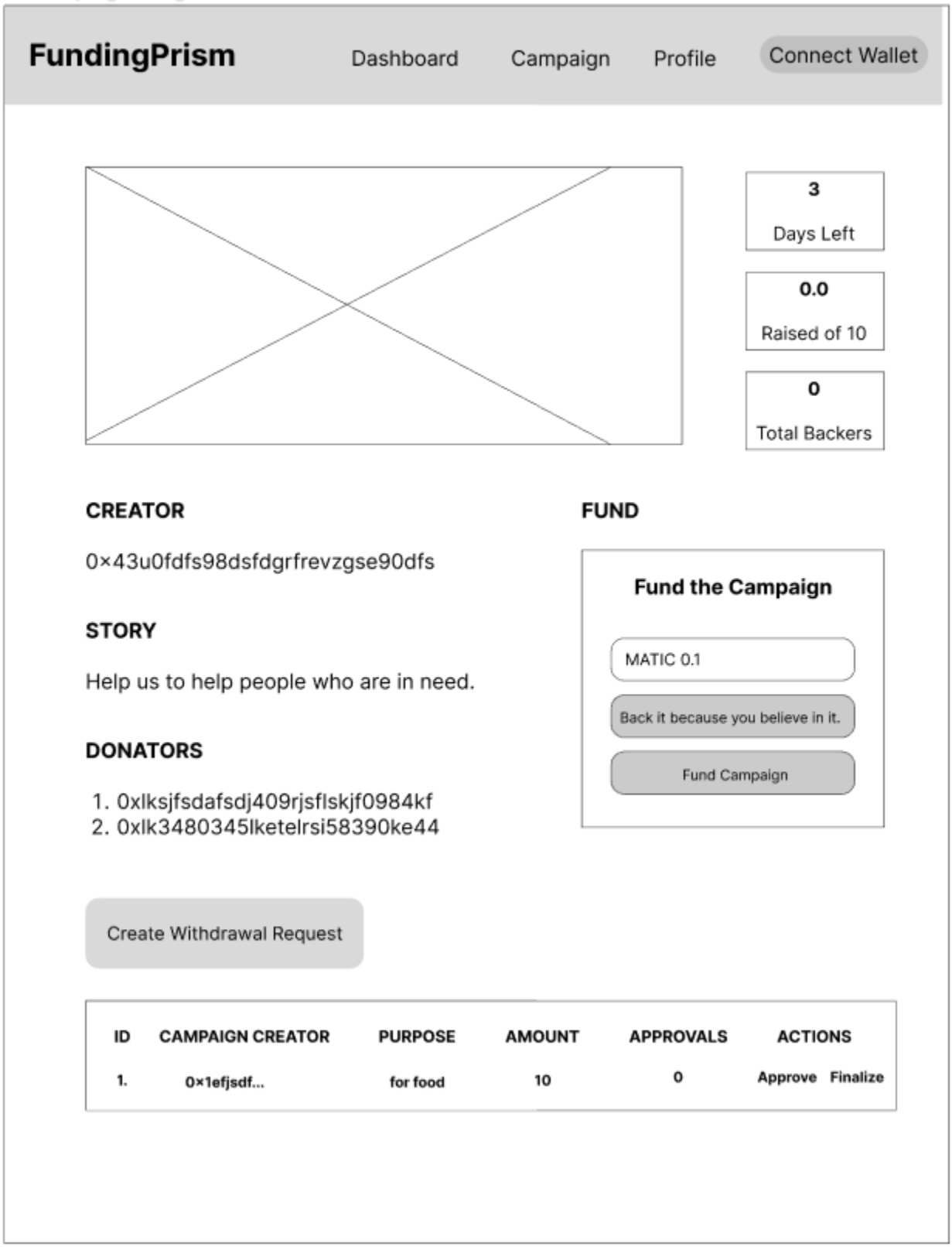
4.7.2 Campaigns Page



4.7.3 Profile Page



4.7.3 Campaign Details Page



CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation Approach

Focus of this project is to create an Ethereum blockchain based decentralised crowd funding application to bring trustability, transparency and security to the fund raising process by eliminating all the limitations of traditional crowdfunding platforms.

The System is composed of four modules:

1. Connect Wallet
2. Create a Campaign
3. Contributing to a Campaign
4. Withdrawal of Funds
5. Display Donators

Waterfall Model

In our final year project documentation, we have chosen to adopt the waterfall development model as our intended implementation approach. The waterfall model is a traditional and linear approach to software development, where each phase is completed before moving on to the next. While our project is still ongoing and not yet completed,

we have planned our implementation approach based on the following distinct phases:

1. **Requirements Gathering**: During the initial phase, we have been diligently gathering project requirements from stakeholders. Our primary focus has been on thoroughly understanding the needs of our customers and defining the software requirements in detail.

2. **System Design**: The system design phase involves creating a comprehensive high-level design for the software. We have meticulously defined the system architecture, overall structure, and interfaces. Additionally, we have outlined the necessary hardware and software requirements to support the system design.
3. **Implementation**: With the detailed design specifications in hand, our development team has been diligently working on the implementation phase. We have been writing the code, bringing the software to life based on the design provided in the previous phase.
4. **Testing**: Once the implementation phase is complete, we will proceed to the testing phase. Our focus during this stage will be to rigorously verify that the software functions correctly and meets all the specified requirements. We will conduct various testing activities, including unit testing, integration testing, beta testing, to ensure the software's quality and reliability.
5. **Deployment**: Once the software successfully passes through the testing phase and receives approval, we will move forward with the deployment phase. This will involve preparing the software for production environments, including tasks such as installation, configuration, and data migration, to ensure seamless integration and operation.
6. **Maintenance**: The final phase of our planned implementation approach will involve ongoing support and maintenance of the deployed software. We will commit ourselves to promptly addressing any user-reported issues, as well as performing necessary updates and enhancements to ensure the software remains fully functional, secure, and up-to-date.

While our project is not yet completed, we have chosen the waterfall model as our implementation approach based on the well-defined nature of our project requirements and the stable context in which we are operating. As our project progresses, we will continue to follow the planned phases of the waterfall model to ensure a structured and organized development process.

5.2 Coding Details and Code Efficiency

5.2.1 Code Efficiency

Smart contract code

```
// SPDX-License-Identifier: UNLICENSED
pragma solidity ^0.8.9;

contract CrowdFunding {
    struct Campaign {
        address owner;
        string title;
        string description;
        uint256 target;
        uint256 deadline;
        uint256 amountCollected;
        string image;
        address[] donators;
        uint256[] donations;
    }

    mapping(uint256 => Campaign) public campaigns;

    uint256 public numberOfCampaigns = 0;

    function createCampaign(
        address _owner,
        string memory _title,
        string memory _description,
        uint256 _target,
        uint256 _deadline,
        string memory _image
    ) public returns (uint256) {
        Campaign storage campaign = campaigns[numberOfCampaigns];

        require(
            campaign.deadline < block.timestamp,
            "The deadline should be a date in the future."
        );

        campaign.owner = _owner;
        campaign.title = _title;
```

```
        campaign.description = _description;
        campaign.target = _target;
        campaign.deadline = _deadline;
        campaign.amountCollected = 0;
        campaign.image = _image;

        numberOfCampaigns++;

        return numberOfCampaigns - 1;
    }

    function donateToCampaign(uint256 _id) public payable {
        uint256 amount = msg.value;

        Campaign storage campaign = campaigns[_id];

        campaign.donators.push(msg.sender);
        campaign.donations.push(amount);

        (bool sent, ) = payable(campaign.owner).call{value: amount}("");

        if (sent) {
            campaign.amountCollected = campaign.amountCollected + amount;
        }
    }

    function getDonators(
        uint256 _id
    ) public view returns (address[] memory, uint256[] memory) {
        return (campaigns[_id].donators, campaigns[_id].donations);
    }

    function getCampaigns() public view returns (Campaign[] memory) {
        Campaign[] memory allCampaigns = new Campaign[](numberOfCampaigns);

        for (uint i = 0; i < numberOfCampaigns; i++) {
            Campaign storage item = campaigns[i];

            allCampaigns[i] = item;
        }

        return allCampaigns;
    }
}
```

Context API code for react and smart contract connection

```
import React, { useContext, createContext } from 'react';

import {
  useAddress,
  useContract,
  useMetamask,
  useContractWrite,
} from '@thirdweb-dev/react';

import { ethers } from 'ethers';
// import { EditionMetadataWithOwnerOutputSchema } from '@thirdweb-dev/sdk';

const StateContext = createContext();

export const StateContextProvider = ({ children }) => {
  const { contract } = useContract(
    '0x0B0ed6f968bF5CDabf570EdA1f2e468DC0F612aF'
  );
  const { mutateAsync: createCampaign, isLoading } = useContractWrite(
    contract,
    'createCampaign'
  );

  const address = useAddress();
  const connect = useMetamask();
  const publishCampaign = async (form) => {
    try {
      const data = await createCampaign({
        args: [
          address, //owner
          form.title,
          form.description,
          form.target,
          new Date(form.deadline).getTime(),
          form.image,
        ],
      });
      console.log('contract call success ', data);
    } catch (error) {
      console.log('contract call failed ', error);
    }
  };
```

```
const getCampaigns = async () => {
  const campaigns = await contract.call('getCampaigns');

  const parsedCampaigns = campaigns.map((campaign, i) => ({
    owner: campaign.owner,
    title: campaign.title,
    description: campaign.description,
    target: ethers.utils.formatEther(campaign.target.toString()),
    deadline: campaign.deadline.toNumber(),
    amountCollected: ethers.utils.formatEther(
      campaign.amountCollected.toString()
    ),
    image: campaign.image,
    pId: i,
  }));
  console.log(parsedCampaigns);
  return parsedCampaigns;
};

const getUserCampaigns = async () => {
  const allCampaigns = await getCampaigns();

  const filteredCampaigns = allCampaigns.filter(
    (campaign) => campaign.owner == address
  );

  return filteredCampaigns;
};

// const data = await contract.call("donateToCampaign", [_id])
const donate = async (pId, amount) => {
  const data = await contract.call('donateToCampaign', [pId], {
    value: ethers.utils.parseEther(amount),
  });
  return data;
};

// getDonations() function is used in CampaignDetail.jsx
// const data = await contract.call("getDonators", [_id])
const getDonations = async (pId) => {
  const donations = await contract.call('getDonators', [pId]);
  const numberOfDonations = donations[0].length;

  const parsedDonations = [];
```

```
    for (let i = 0; i < numberOfDonations; i++) {
      parsedDonations.push({
        donator: donations[0][i],
        donation: ethers.utils.formatEther(donations[1][i].toString()),
      });
    }

    return parsedDonations;
  };

  return (
    <StateContext.Provider
      value={{
        address,
        contract,
        connect,
        createCampaign: publishCampaign,
        getCampaigns,
        getUserCampaigns,
        donate,
        getDonations,
      }}>
      {children}
    </StateContext.Provider>
  );
};

export const useStateContext = () => useContext(StateContext);
```

5.3 Testing Approach

In order to ensure the quality and reliability of our system, we have devised a comprehensive testing approach that consists of three key phases: unit testing, integration testing, and beta testing.

5.3.1 Unit Testing

Unit testing focuses on testing individual units or modules in isolation. This phase aims to verify the functionality and behavior of each unit or module independently. During unit testing, we will thoroughly test the interaction of functions within a module while confining the tests within that specific module.

Unit testing plays a crucial role in ensuring the proper functionality and reliability of a blockchain-based crowdfunding platform. In the context of this project, it is essential to consider the following aspects when conducting unit testing:

1. **Smart Contract Testing**: Smart contracts are the backbone of the crowdfunding platform as they define the rules and logic of the crowdfunding process. To validate the behavior and functionality of each smart contract, design unit tests that cover scenarios such as contributions, fund transfer and fund retrieval, and contract termination. These tests ensure the correct handling of various crowdfunding scenarios. For testing smart contract we will use remix idle.
2. **Transaction Processing**: Unit tests should focus on validating the processing of transactions within the platform. This includes verifying the accuracy of transaction validation, fee calculations, transaction signing, and related processes. Place emphasis on ensuring secure and accurate handling of transactions to prevent vulnerabilities and inaccuracies.
3. **Data Storage and Retrieval**: To maintain the integrity and consistency of the information stored on the blockchain, it is crucial to test the data storage and retrieval mechanisms. Create unit tests that cover scenarios such as storing crowdfunding campaign details, backer information, funding goals, and progress tracking. Verify the accurate retrieval of this information when required.
4. **Integration with Blockchain Network**: Unit tests should validate the integration between the crowdfunding platform and the underlying blockchain network. Simulate interactions such as deploying smart contracts, sending transactions, and querying blockchain data to ensure correct platform interaction and appropriate handling of responses.

5.3.2 Integration Testing

Integration testing involves bringing all the individual modules together into a special testing environment. This phase focuses on checking for errors, bugs, and interoperability among the integrated modules. By combining the modules, we can evaluate the behavior and performance of the entire application. Integration testing allows us to test the system as a whole and ensures that all modules work seamlessly together.

Integration testing in the context of a blockchain-based crowdfunding platform involves testing the integration of various components within the platform to ensure they work together seamlessly. It focuses on verifying the interactions and data flow between different modules, subsystems, and external systems involved in the crowdfunding process.

Here are some key aspects to consider when performing integration testing for a blockchain-based crowdfunding platform:

1. **Smart Contracts:** Smart contracts are an integral part of blockchain platforms. Ensure that the smart contracts responsible for crowdfunding operations, such as accepting contributions, disbursing funds, and enforcing business rules, are properly integrated into the platform and function as expected.
2. **Blockchain Network:** Test the integration between the crowdfunding platform and the underlying blockchain network. Verify that the platform can interact with the blockchain to record transactions, retrieve data, and update the ledger accurately.
3. **User Interfaces:** Verify the integration between the user interfaces and the backend components. Test the functionality and responsiveness of the crowdfunding platform's web or mobile interfaces, ensuring they can communicate effectively with the underlying blockchain infrastructure.
4. **End-to-End Scenarios:** Perform end-to-end integration tests to simulate real-world scenarios, covering the entire crowdfunding process from project creation to fund disbursement. This includes testing user wallet connection, campaign creation, contribution handling, reward distribution, and project completion.

5.3.3 Beta Testing

In addition to unit and integration testing, we will conduct beta testing to gather feedback from real end-users or a selected group of external stakeholders. Beta testing provides an opportunity to evaluate the system's performance, usability, and user satisfaction in a real-world environment. By involving users outside the development team, we can gain valuable insights and identify potential areas for improvement.

Beta testing in the context of a blockchain-based crowdfunding platform involves releasing a pre-release version of the platform to a limited group of users, often referred to as beta testers, to

evaluate its functionality, performance, and user experience. The primary goal of beta testing is to gather feedback and identify any issues or areas of improvement before the platform is fully deployed to the public. Here's an overview of beta testing specific to a blockchain-based crowdfunding platform:

1. **Recruitment of Beta Testers:** Select a diverse group of individuals who represent the target user base of the crowdfunding platform. This can include project creators, backers, and other stakeholders interested in crowdfunding campaigns. Consider their familiarity with blockchain technology and crowdfunding to ensure a mix of experienced and novice users.

2. **Test Environment Setup:** Set up a dedicated environment for beta testing that closely resembles the production environment. This includes deploying the blockchain network, configuring smart contracts, and creating a simulated ecosystem where beta testers can interact with the platform.
3. **Usability and User Experience Testing:** Assess the user interface, navigation, and overall user experience of the platform. Pay attention to the clarity of instructions, intuitiveness, and responsiveness. Identify any usability issues, confusing features, or areas where users may encounter difficulties in using the platform effectively.
4. **Iterative Improvement:** Use the feedback received during beta testing to make necessary refinements and enhancements to the platform. Continuously iterate on the platform, addressing identified issues, improving user experience, and implementing suggested features or improvements.

5.4 Test Cases

5.4.1 Navbar

Test case id	Test case name	Test case description	Steps	Expected Result	Actual Result	Test Result
1	Navbar	To verify metamask wallet pop up	- Click on the connect button of navbar.	Metamask wallet pop up	Metamask wallet pop up	Pass
2	Navbar	To verify metamask account connection	- Click on the connect button of navbar. - select account you want to connect. - Click on next and then click connect. - Open metamask again. - Check the connection. Status	Status changed to connected	Status changed to connected	Pass
3	Navbar	To verify Navbar connect button state change.	- Connect metamask wallet to the website	Status changed to Create a campaign	Status changed to Create a campaign	Pass
4	Navbar	To verify Navbar Create a campaign button state change.	- Open metamask. - Click on three dots below the profile photo. - Click on Connected sites - Disconnect from our website.	Status changed to connected	Status changed to connected	Pass
5	Navbar	To verify redirection to campaign page.	- Connect wallet if disconnected. - click on Create a campaign Button.	Redirected to campaign page	Redirected to create a campaign page	Pass
6	Navbar	To verify redirection to campaign page.	- Click on campaign button button of the navbar.	Redirected to campaign page, button background color turned green and	Redirected to campaign page, button background color turned green and	Pass

				text color turned gray.	text color turned gray.	
7	Navbar	To verify redirection to profile page.	- Click on profile button button of the navbar.	Redirected to profile page, button background color turned green and text color turned gray.	Redirected to profile page, button background color turned green and text color turned gray.	Pass

5.4.2 Campaign Page

Test case id	Test case name	Test case description	Steps	Expected Result	Actual Result	Test Result
1	Create Campaign	To verify Submit new campaign button.	- do not fill any field in the form. - Click on Submit new campaign button.	Please fill out this field displayed.	Please fill out this field	Pass
2	Create Campaign	To verify Submit new campaign button.	- fill some fields in the form. - Click on Submit new campaign.	Please fill out this field displayed.	Please fill out this field displayed.	Pass
3	Create Campaign	To verify Goal input field.	- Enter some string.	No value is typed in Goal field.	No value is typed in Goal field.	Pass
4	Create Campaign	To verify Goal input field.	- Enter a number.	number is typed in Goal filed.	number is typed in Goal filed.	Pass
5	Create Campaign	To verify Goal input field.	- Enter a number. - Click on arrow pointing upwards.	Number is incremented by 0.1.	Number is incremented by 0.1.	Pass
6	Create Campaign	To verify Goal input field	- Enter a number. - Click on arrow pointing downwards.	Number is decremented by 0.1.	Number is decremented by 0.1.	Pass
7	Create Campaign	To verify EndDate input field.	- Click on calendar icon. - Select date.	Selected date is entered in EndDate field.	Selected date is entered in EndDate field.	Pass
8	Create Campaign	To verify Submit new campaign button	- Fill all the input field. - Click on submit new Campaign - Meta mask wallet pop up Appear. - Click on confirm.	Redirected to dashboard And campaign is created on dashboard page.	Redirected to dashboard And campaign is created on dashboard page.	Pass

5.4.3 Profile Page

Test case id	Test case name	Test case description	Steps	Expected Result	Actual Result	Test Result
1	Profile	To verify the correct display of campaigns created by the user	- connect new account to the website. - Navigate to profile page.	You have not created any campaigns yet displayed.	You have not created any campaigns yet displayed	Pass
2	Profile	To verify the correct display of campaigns created by the user.	- connect new account to the website. - Navigate to campaign page. - Create new campaign. - Navigate to profile page.	Campaign created by the user is displayed.	Campaign created by the user is displayed.	Pass
3	Profile	To verify redirection to campaign details page.	- Navigate to profile page. - Click on campaign card.	Redirected to campaign details page.	Redirected to campaign details page.	Pass

5.4.4 Dashboard Page

Test case id	Test case name	Test case description	Steps	Expected Result	Actual Result	Test Result
1	Dashboard	To verify the correct display of all the campaigns.	- Navigate to dashboard page.	all the campaigns are displayed	all the campaigns are displayed	Pass
2	Dashboard	To verify the correct display message when no campaigns are there to display.	- Navigate to dashboard page.	You have not created any campaigns yet. displayed	You have not created any campaigns yet. displayed	Pass
3	Dashboard	To verify redirection to campaign details page.	- Navigate to dashboard page. - Click on campaign card	Redirected to campaign details page.	Redirected to campaign details page.	Pass

5.4.5 Funding and Withdrawal

Test case id	Test case name	Test case description	Steps	Expected Result	Actual Result	Test Result
1	Fund transfer	To verify fund transfer to smart contract.	- navigate to campaign details of any campaign. - enter donation amount in fund form. - click on fund button.	Fund is transferred to smart contract.	Fund is transferred to campaign creators account.	Fail
2	Funding and Withdrawal.	To verify creation of withdrawal request.	- click on any campaign card. - click on create withdrawal Request. - Fill details in the form.	Withdrawal request created and appended to table.	Withdrawal request not created.	Fail
3	Funding and Withdrawal.	To verify approve button.	- navigate to campaign details page. - donate to campaign. - click on approve button.	Approvals incremented by 1.	Approval is not incremented.	Fail
4	Funding and Withdrawal.	To verify finalize button.	- create a campaign. - donate some fake matic to Campaign. - create withdrawal request. - click on approve button. - click on finalize button.	Fund is transferred to campaign creators account.	Fund is not transferred to campaign creators account.	Fail

5.5 Modification and Improvement

One of the major advantages of blockchain is data security. Once data is uploaded to the blockchain, it becomes unalterable and irremovable. However, this feature of blockchain posed a challenge for us when we needed to remove campaigns from our frontend after they had reached their goal amount or deadline.

To address this issue, instead of removing the data from the blockchain, we chose to hide these campaigns using frontend code. We encountered this problem on both the dashboard and profile pages of our website.

Since we are using React to develop our frontend, we can leverage its component-based architecture to break down our application into smaller, reusable components. This feature greatly reduces code redundancy and improves efficiency.

To hide campaigns that have achieved their goal or deadline, we made the following changes in the FundCampaign component.

FundCampaign.jsx file

```jsx
import { useState } from 'react';
import { daysLeft } from '../utils';

const FundCard = ({
  owner,
  title,
  description,
  target,
  deadline,
  amountCollected,
  image,
  handleClick,
}) => {
  const remainingDays = daysLeft(deadline);
  // const [completed, setCompleted] = useState(false);
  // if (target === amountCollected) {
  //   setCompleted(true);
  // }
  return (
    <div
      className={`sm:w-[288px] w-full rounded-[15px] bg-[white] cursor-pointer drop-shadow-lg ${
        target === amountCollected || remainingDays < 0 ? 'hidden' : 'visible'
      }`}
      onClick={handleClick}>
      <img
        src={image}
        alt='fund'
        className='w-full h-[158px] object-cover rounded-[15px]'
      />
      <div className='flex flex-col p-4'>···
      </div>
    </div>
  );
};
export default FundCard;
```

On line 22, I added a line of code that ensures that once a campaign has achieved its goal or reached its deadline, it will be assigned the "hidden" property in CSS, effectively hiding it from view.

```
className={`sm:w-[288px] w-full rounded-[15px] bg-[white] cursor-pointer drop-
shadow-lg ${
        target === amountCollected || remainingDays < 0 ? 'hidden' : 'visible'
      }`}
```

CHAPTER 6

RESULTS AND DISCUSSION

6.1 Test Reports

Test report no.	Test case name	Test executed	Test pass	Test fail	Total	Bug tracking	Status
1	Navbar	7	7	0	7	0	Done
2	Create Campaign	8	8	0	8		
3	Profile	3	3	0	3	0	Done
4	Dashboard	3	3	0	3	0	Done
5	Funding and Withdrawal	4	0	4	4	0	Done

6.2 User Documentation

Our crowdfunding platform uses blockchain technology to bring transparency in crowdfunding process, in traditional crowdfunding platform amount donated by user directly goes into campaign creators account but with blockchain we can create a system which can hold the money in between.

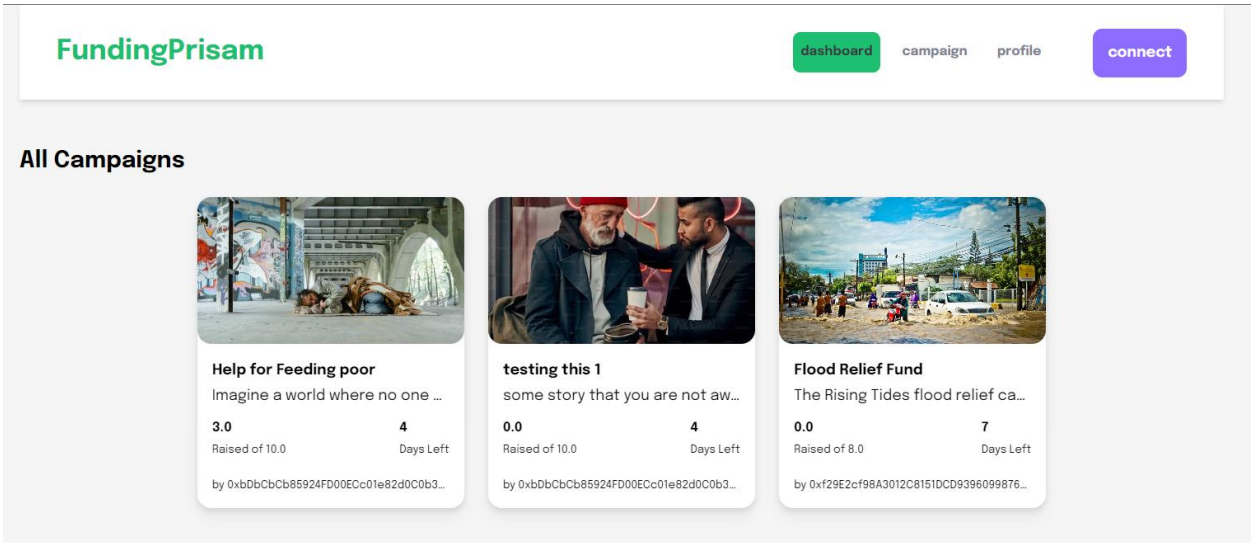
To implement this project we have used solidity, react js, tailwind css, polygon test network and third web. For writing smart contract we made use of solidity language, building smart end of the blockchain based website is very difficult with vanilla javascript, so used the react js framework for building frontend of our application react allows us to break our application in small reusable components which helps in reducing code redundancy, for testing our application we deployed it on polygon test network.

Following are the requirements for using our website

1. For using any decentralized application user need to install metamask wallet on his system.
2. User must create account on metamask.
3. For creating campaigns or doing donations he should have enough balance in his account.
4. User must be on the same network on which our crowdfunding platform is deployed.

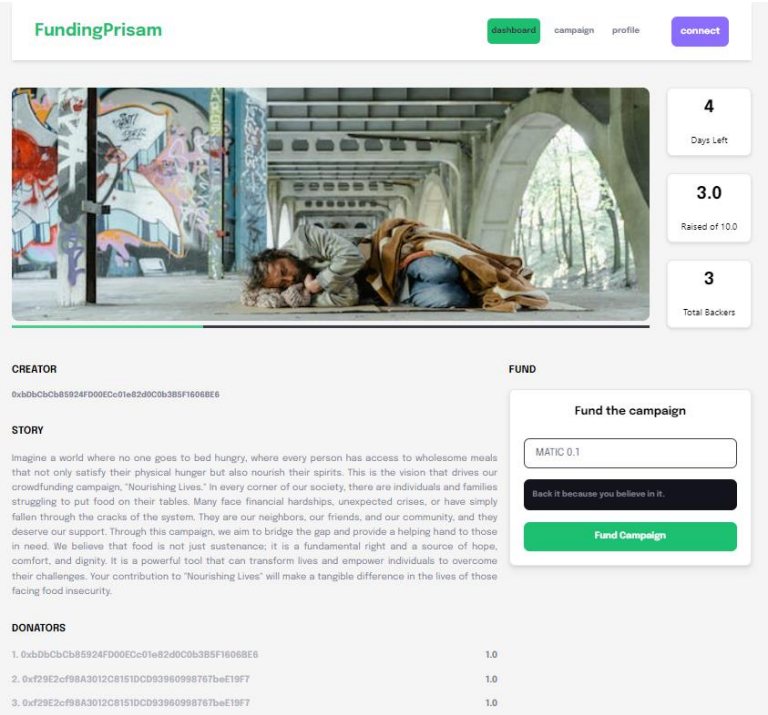
Here are the screenshots and description of working our project:

1. Dashboard Page



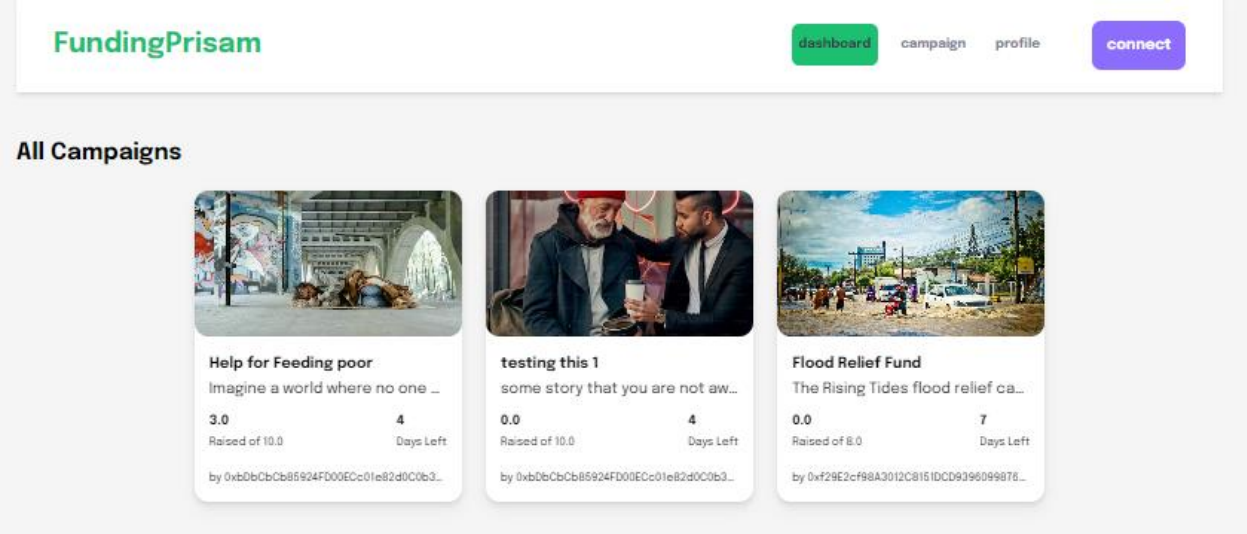
This is the home page of our website if user click on any of the campaign then he will be redirected to campaign details page of that campaign. If user clicks on Help for Feeding poor campaign then he will be redirected to campaign details page of that campaign.

2. Campaign Details Page

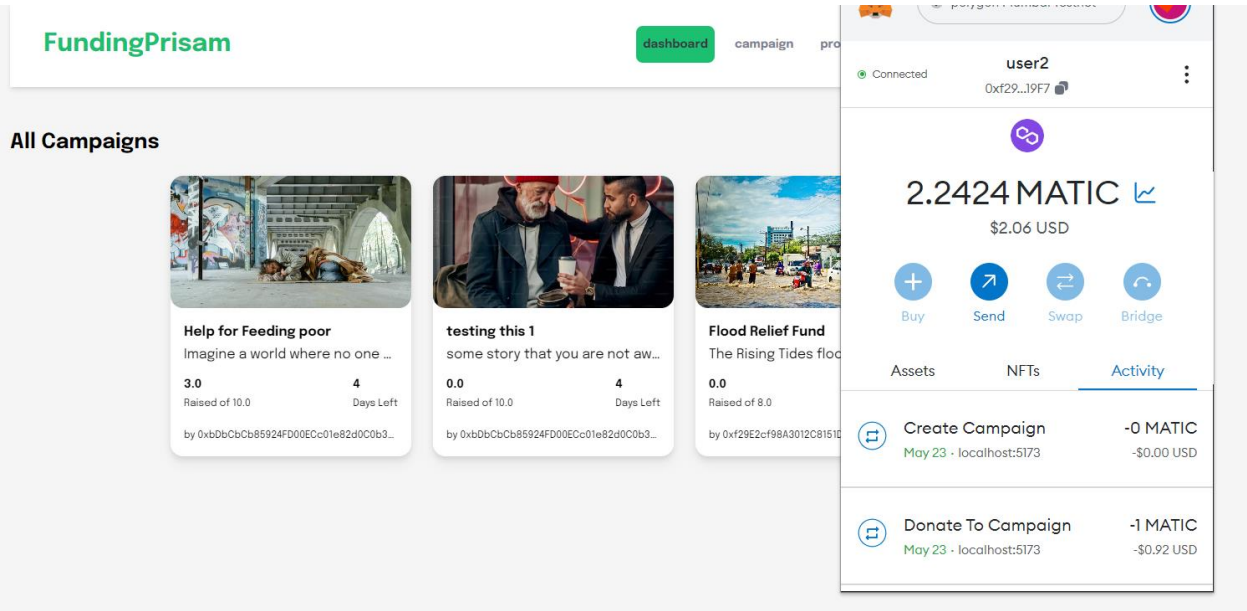


On campaign details page all the information of that campaign is displayed. If user wants to make contribution or create campaign then he must connect his metamask account to your website by clicking on connect button on navbar which is in purple color.

3. Connect Wallet

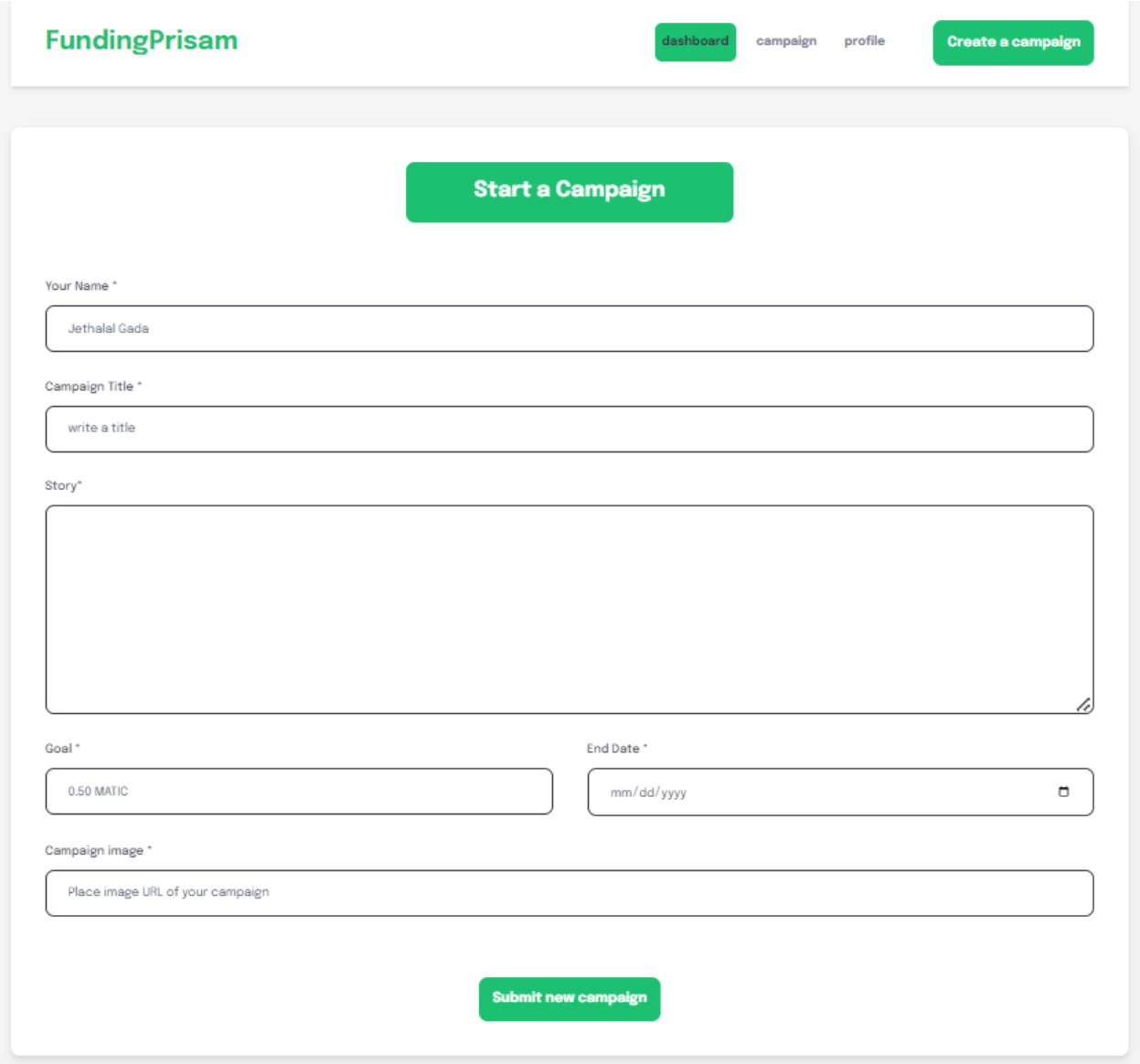


After clicking on connect button metamask window will pop up follow the steps and connect it with our website.



4. Create Campaign Page

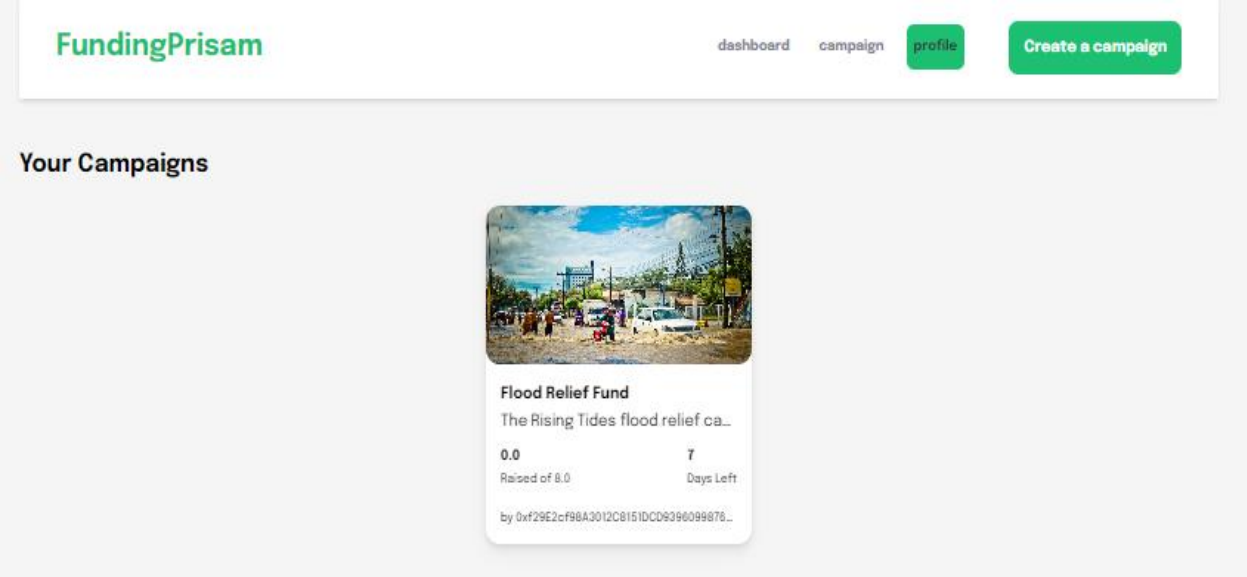
Click on create a campaign button or campaign button after connecting your wallet to website to go to the campaign creation page.



Fill all the details correctly then click on submit new campaign button, campaign will get created and you will be redirected to dashboard page where all the campaigns are displayed.

5. Profile Page

Only the campaigns that are created by user will be displayed on profile page.



CHAPTER 7

CONCLUSION

7.1 Significance of system

The significance of blockchain-based crowdfunding platforms lies in the transformative capabilities they bring to the fundraising landscape. Here are some key aspects that highlight the significance of this crowdfunding platforms:

1. Enhanced Trust and Transparency: Blockchain technology introduces a decentralized and immutable ledger where all transactions and interactions are recorded. This transparency builds trust among participants, as every transaction can be verified and audited, ensuring accountability and reducing the risk of fraudulent activities. It provides a higher level of transparency compared to traditional crowdfunding platforms, attracting both project creators and investors.
2. Increased Security: Blockchain-based crowdfunding platforms leverage cryptographic algorithms and consensus mechanisms to secure transactions and user data. The decentralized nature of the blockchain ensures that there is no single point of failure, making it extremely difficult for malicious actors to compromise the system. The use of smart contracts further enhances security by automating and enforcing predefined rules and conditions.
3. Global Accessibility: Blockchain-based crowdfunding platforms have a global reach, enabling individuals from anywhere in the world to participate and contribute to projects. By leveraging cryptocurrencies or tokenized assets, these platforms eliminate traditional barriers such as geographical limitations and currency exchange restrictions. This global accessibility opens up new avenues for project creators to attract a diverse pool of investors and contributors.
4. Elimination of Intermediaries: Blockchain-based crowdfunding platforms have the potential to reduce or eliminate the need for intermediaries, such as banks or payment processors. By leveraging smart contracts, the crowdfunding process can be automated and executed directly between project creators and investors, reducing costs and increasing efficiency. This disintermediation allows for more direct and frictionless transactions, benefiting both parties involved.

7.2 Limitations of the system

In this platform, our initial plan was to store funds on a smart contract instead of directly sending money to the campaign creator's account. To ensure a transparent and community-driven process, we intended to implement a withdrawal mechanism. In this system, the campaign creator would submit a withdrawal request, stating the purpose for the funds. However, due to time constraints, we were unable to implement this functionality as initially intended.

Under the proposed system, the withdrawal request would require approval from a majority (more than 50%) of the platform's users. This approach aimed to foster a democratic decision-making process and ensure the responsible use of funds. The intention was to prioritize community consensus and mitigate the risk of misuse or mismanagement of funds.

While we acknowledge that the implementation of this withdrawal mechanism would have added an additional layer of accountability and transparency, the time constraints during the development phase limited our ability to fully realize this feature.

Despite the unimplemented functionality, our platform still offers valuable crowdfunding opportunities, leveraging blockchain technology to enhance trust, security, and transparency in the fundraising process.

During the implementation of this system, we aimed to design the "create campaign" functionality to allow users to upload images for their campaigns directly from their local machines. However, storing images directly on the blockchain network would have incurred significant costs. To overcome this challenge, we opted to utilize Infura IPFS as a solution for uploading images.

Unfortunately, we encountered difficulties in uploading images on Infura IPFS. As a result, we explored alternative IPFS services, such as Pinata, to address the issue. However, we faced delays and extended loading times when uploading images using Pinata. Consequently, we made a decision to modify the functionality. Instead of directly uploading the image, users are now required to provide a URL pointing to the desired image. We store this URL on a third-party web IPFS service, and with the aid of React, we utilize the URL to display the associated image.

By adopting this adjusted approach, we were able to overcome the challenges related to image uploading while still leveraging the benefits of IPFS technology for decentralized storage. The utilization of external web IPFS services, in combination with React, enabled us to seamlessly incorporate image display functionality within our system.

7.3 Future scope of the project

1. Payment gateway integration: In our website, the sole method of donating to campaigns is through cryptocurrency. However, to cater to individuals who do not utilize cryptocurrency, we can integrate a payment gateway like Stripe. This integration will provide an alternative payment option, allowing users to contribute using traditional fiat currencies.
2. Integrating different wallets: While we have successfully integrated the MetaMask wallet, which is widely used for crypto transactions, it is essential to acknowledge that some users may prefer different wallets such as Coinbase Wallet. To cater to a broader user base, we can explore the integration of multiple wallets, ensuring compatibility and convenience for users with varying wallet preferences.
3. Enhanced User Experience: Continual improvements to the user experience can have a significant impact on the success of a crowdfunding platform. By streamlining the user interface, simplifying the registration and campaign creation processes, and incorporating intuitive features for browsing and discovering projects, we can enhance user engagement. Additionally, incorporating gamification elements, social features, and personalized recommendations can further elevate the overall user experience, making it more enjoyable and compelling for users.

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