

University of Mumbai

A

Project Report on

**“BetterFund: Crowdfunding Platform powered by
Blockchain”**

Submitted by

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Under the Guidance of

Prof. Moeenuddin Ansari



Department of Computer Science & Engineering (AIML)

Theem College of Engineering

Boisar - Chilhar Road, Boisar (E), 401501

(2023-24)

“BetterFund: Crowdfunding Platform powered by Blockchain”

Submitted in partial fulfillment of the requirements of the Degree of

Bachelor of Engineering

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DEPARTMENT OF COMPUTER ENGINEERING

THEEM COLLEGE OF ENGINEERING

Boisar-Chilhar Road, Boisar (E), 401501

(Approved By AICTE New Delhi, Government of Maharashtra &
DTE, Affiliated to University of Mumbai & MSBTE)

Awarded 'B+' Grade by NAAC



CERTIFICATE

This is to certify that the Project entitled **“BETTERFUND: CROWDFUNDING PLATFORM POWERED BY BLOCKCHAIN”** is a bonafide work of **Mr. RUDRANSH DUBEY (46)** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the Degree of **“Bachelor of Engineering”**.

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Mini-Project Report Approval for S.E.

We hereby formally approve the mini-project report titled "**BETTERFUND: CROWDFUNDING PLATFORM POWERED BY BLOCKCHAIN**", authored by **Mr. Rudransh Dubey (46)**, for the Degree of "Bachelor of Engineering". This formal approval signifies that the project has met the prescribed standards and criteria, aligning with the requirements for the degree award in a satisfactory manner.

Examiners

1.....

2.....

Date:

Place:

DECLARATION

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, we 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. We 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.

Date:

Mr. Rudransh Dubey (46)

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Mr. Rudransh Dubey (46)

ABSTRACT

BetterFund is a revolutionary crowdfunding platform harnessing the power of Ethereum blockchain technology to address the challenges plaguing existing platforms. Traditional crowdfunding has struggled with issues of transparency, security, and trust. In response, BetterFund leverages the Ethereum blockchain's decentralized and immutable ledger to create a secure, transparent, and efficient ecosystem. Through smart contracts, it establishes a trustless environment, reducing the risk of fraud and instilling investor confidence. Project creators can initiate campaigns with specific funding goals and incentives using smart contracts, while contributors can engage using Ether (ETH). Funds are released automatically when conditions are met, eliminating intermediaries and minimizing misappropriation risks. BetterFund also focuses on global accessibility, welcoming anyone with an internet connection and an Ethereum wallet. By eliminating intermediaries, it reduces fees and administrative overhead, ensuring a higher percentage of funds go directly to project creators. BetterFund represents a cutting-edge, cost-effective, and secure crowdfunding platform aiming to redefine how projects are funded while rebuilding trust within the crowdfunding industry.

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Chapter 1

Introduction

1.1 An overview

In light of the global surge in crowdfunding activities, my project endeavors to introduce a streamlined and efficient crowdfunding platform uniquely designed to cater to the urgent requirements of users during times of crisis, as exemplified by the challenges posed by the COVID-19 pandemic. I am committed to establish a secure, transparent, and user-friendly ecosystem, wherein both individuals and organizations can seamlessly initiate and endorse a wide spectrum of campaigns. These campaigns span from immediate and small-scale initiatives focused on critical medical aid to more extensive, long-term projects with far-reaching impacts. The platform aspires to become a catalyst for change during pivotal moments, enabling individuals and entities to come together and contribute meaningfully towards the betterment of society.

1.2 Motivation

The motivation behind this project is deeply rooted in our commitment to addressing the evolving challenges faced by individuals and communities in times of crisis. Witnessing the global upsurge in crowdfunding activities during these critical moments has inspired me to create a platform that can efficiently channel support to those in need. I was driven by a sense of responsibility and empathy, knowing that a streamlined and secure crowdfunding solution can make a significant difference in providing timely assistance. By developing this platform, I aimed to empower individuals and organizations to initiate and contribute to campaigns, fostering a collective spirit of generosity and resilience when it matters most.

1.3 Problem Definition

This project is a response to critical shortcomings in current crowdfunding platforms. Firstly, I tackled the ever-growing concern of security by harnessing the impenetrable capabilities of blockchain technology. Secondly, I placed a premium on transparency and anti-fraud measures to ensure funds are used with utmost integrity. Lastly, my mission was to empower global participation, breaking down geographical barriers, inspired by impactful initiatives like CryptoRelief.

1.4 Aim of Project

1. Blockchain Innovation: Explore innovative uses of blockchain technology.
2. Global Participation: Enable worldwide contributions.
3. Real Impact: Make a tangible difference in crowdfunding.
4. Develop a secure and user-friendly crowdfunding platform.
5. Facilitate efficient campaign initiation and support.
6. Ensure transparency in campaign progress and fund utilization.
7. Foster contributions to various crisis-related initiatives.
8. Enable future scalability and adaptability to different crisis scenarios.

1.5 Scope of Project

This project extends far beyond crisis response, envisioning a crowdfunding platform capable of catalyzing change in diverse realms such as arts, education, and entrepreneurship. By embracing blockchain technology, it enhances transparency and security. The platform's global reach, enabled by AI-driven personalization, connects donors and campaigners worldwide. Collaborations with NGOs and corporations amplify the campaign impact. Users can contribute to social change through volunteerism and skills-sharing. With boundless potential, this platform stands as a dynamic force, fostering lasting societal progress and transformation.

1.6 Feasibility: Technical and Non-Technical

1.6.1 Technical Feasibility

- It is to be a ReactJS based application, which will be supported by any web browser.
- Internet connectivity will be required.
- Users will require 'MetaMask' browser extension to sign transactions.

1.6.2 Social Feasibility

- **Trust Building:** Betterfund aims to build trust among individuals and organizations by providing a transparent and secure platform. This will encourage people to contribute to a wide range of causes with confidence.
- **Reducing Fraud:** The project addresses the prevalent issue of fraud in crowdfunding. By implementing security measures and verification processes, it strives to minimize fraudulent activities, protecting both donors and campaigners.
- **Social Impact:** Betterfund can have a profound social impact by facilitating contributions to causes that can significantly improve people's lives. This includes supporting medical treatments, disaster relief, education, and various community initiatives.
- **Community Engagement:** The platform fosters a sense of community and shared purpose. Users can engage with like-minded individuals, share stories, and collectively make a positive difference.

1.6.3 Economic Feasibility

- Given the Ethereum Blockchain provides us with most of the security features, the development does not require much cost.
- The only cost would be the server cost of the deployed application.

Chapter 2

Proposed Solution

2.1 Identifying stakeholders

In the intricate web of our crowdfunding ecosystem, it's imperative to recognize the diverse array of stakeholders who shape the narrative of Betterfund. The stakeholders are the lifeblood of our platform, playing pivotal roles in its success. They can be divided into two distinct yet interconnected categories:

1. **Campaign Creators:** At the heart of our platform are the ingenious Campaign Creators, individuals and organizations with unwavering visions and noble causes. They are the architects of change, crafting compelling campaigns that ignite hope and inspire action.
 2. **Campaign Contributors & Approvers:** The second group consists of two crucial segments. The Campaign Contributors are the benevolent souls who lend their support, contributing to the realization of these remarkable campaigns. Among them, the Approvers hold a unique responsibility, having demonstrated exceptional commitment by surpassing the Minimum Contribution threshold. They wield the power to approve withdrawal requests, ensuring that the funds are utilized judiciously.
- The stakeholders are not just roles but individuals driven by compassion, dreams, and a collective vision for a better world. In acknowledging the multifaceted roles of our stakeholders, we pave the way for a collaborative journey where every voice matters, and every contribution counts. Together, we strive to make Betterfund a platform where dreams come true, one campaign at a time, and where the collective efforts of Campaign Creators, Contributors, and Approvers bring about transformative social change.

2.2 Detailed Solution

In response to the limitations of centralized platforms, this proposal introduces a Decentralized Crowdfunding Platform on the Ethereum Blockchain, offering transparency and trust. Unlike traditional web-based applications, which are centralized and rely on a single company's server, this innovative solution embraces decentralization. It stores campaign and fund data on a decentralized, immutable blockchain, visible to all participants, thus preventing reliance on a single server. It leverages smart contracts for automation, reducing the need for intermediaries. User interaction occurs securely through Ethereum wallets, and a user-friendly interface simplifies campaign management. Rigorous security audits are conducted to ensure the platform's robustness. This solution has the potential to revolutionize crowdfunding, providing a secure, transparent, and efficient means to support campaigns, not only during crises but in various contexts, showcasing the transformative capabilities of blockchain technology.

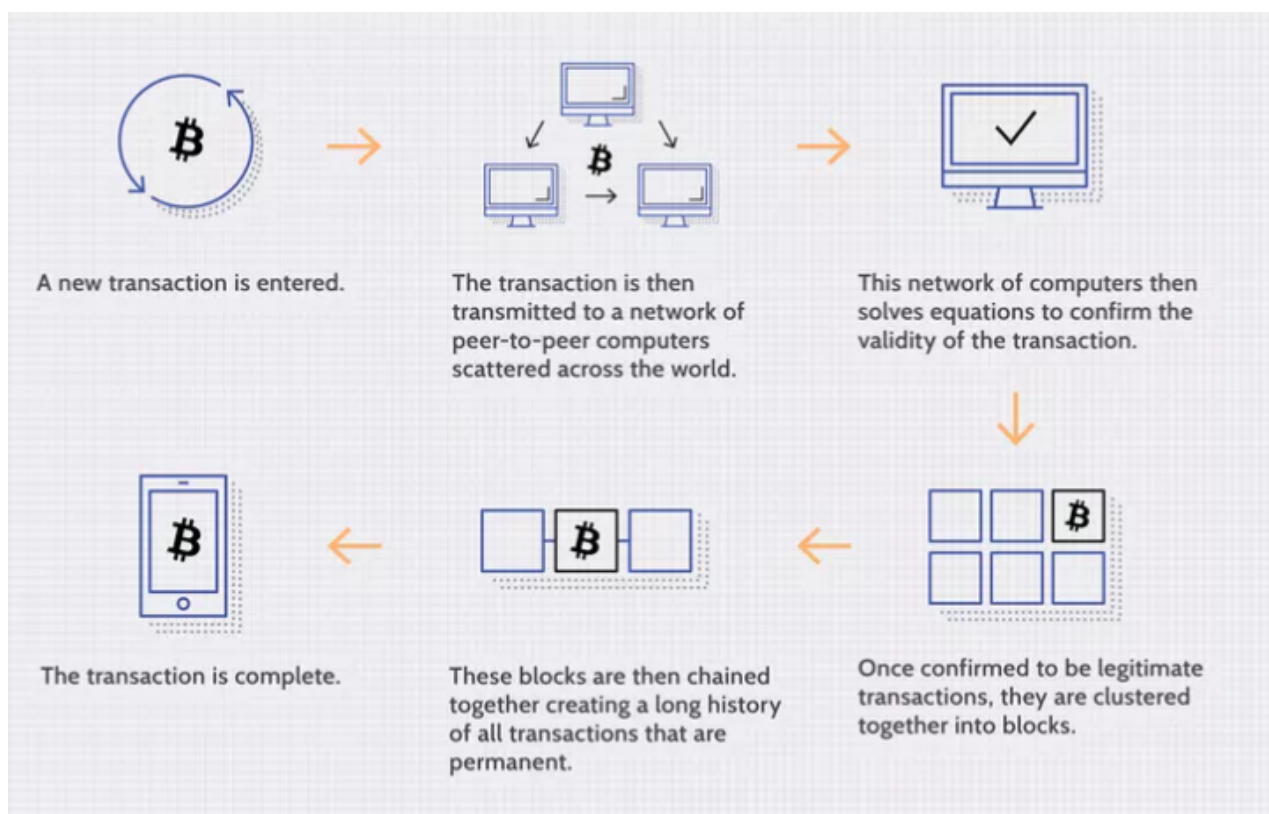


Fig 1: Transaction Process in Blockchain

Chapter 3

System Architecture

3.1 Introduction

The first step in developing anything is to state the requirements. This section delves into the technical underpinnings of our Decentralized Crowdfunding Platform on the Ethereum Blockchain. It outlines how Ethereum smart contracts, blockchain storage, user wallets, and an intuitive user interface work in harmony to provide a secure and efficient crowdfunding experience. This robust system design sets the stage for blockchain's transformative potential in modern crowdfunding.

3.2 Design

The website's UI/UX skeleton includes a prominent header with logo and navigation menus, a visually striking hero section, content sections for text and media, strategically placed call-to-action buttons, user-friendly forms and input fields, an optional sidebar for complementary content, a footer with contact and policy information, and mobile-responsive design. Throughout, user experience enhancements such as intuitive navigation, interactive elements, and a consistent color scheme and typography ensure an engaging and accessible browsing experience, catering to a diverse range of users.

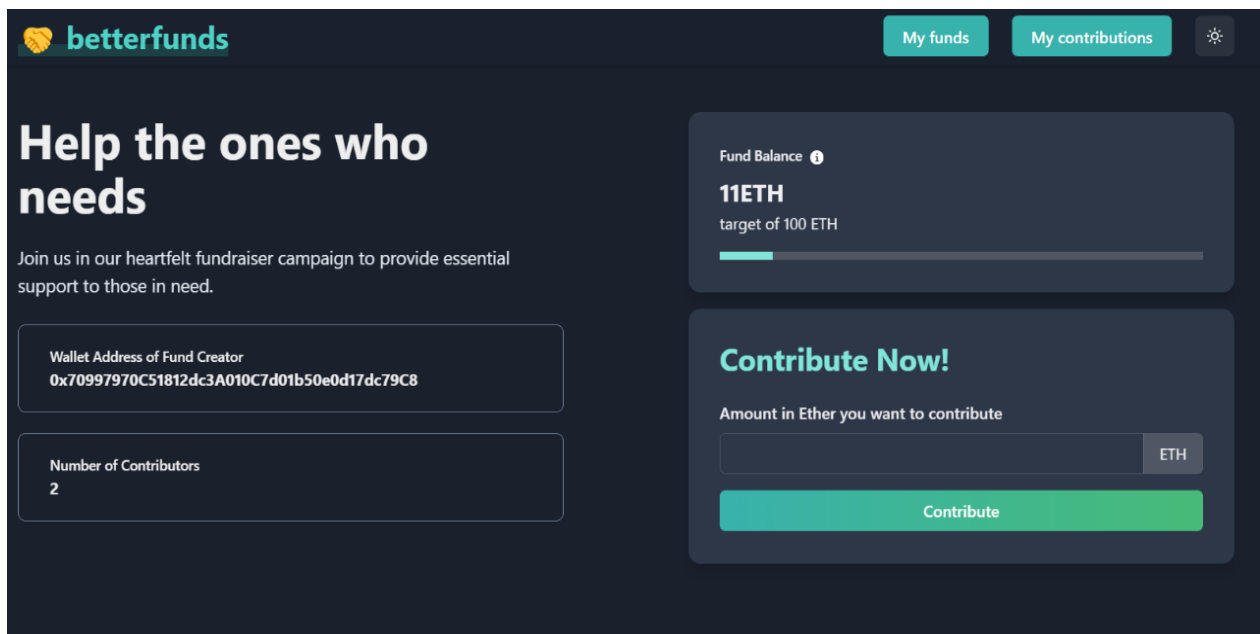


Fig 2: Withdrawal page UI

3.3 Tech Stack Analysis

In order to achieve the solution, we have chosen a tech stack that is :

- Optimized for speed
- Efficient
- Secure

3.3.1 Technologies Used:

1. **Next.JS** : Next.js is an open-source React front-end development web framework that enables functionality such as server-side rendering and generating static websites for React based web applications.
2. **Chakra UI** : Chakra UI is a simple, modular and accessible component library that gives the building blocks one needs to build React applications.
3. **Solidity** : It is the programming language for implementing Ethereum based Smart Contracts.
4. **Web3** : web3.js is a collection of libraries that allow you to interact with a local or remote Ethereum node using HTTP, IPC or WebSocket.
5. **Ethereum Smart Contract** : It is the collection of functions and data that reside at a specific address on the Ethereum Blockchain.



Fig 3: Technologies Used

3.4 System Architecture (Model Design)

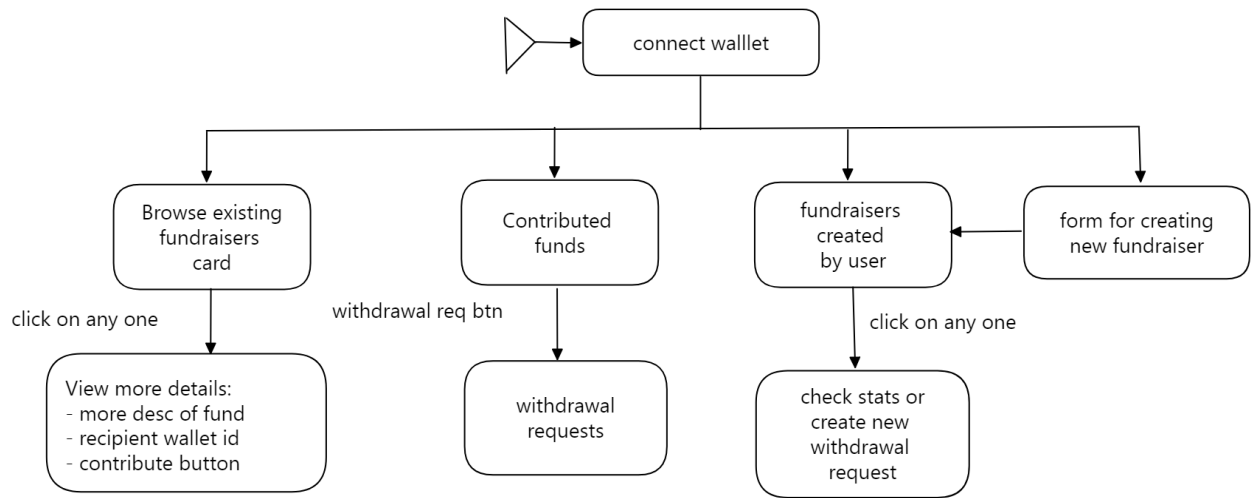


Fig 4: System Architecture

I

3.5 Proposed System (block diagram) :

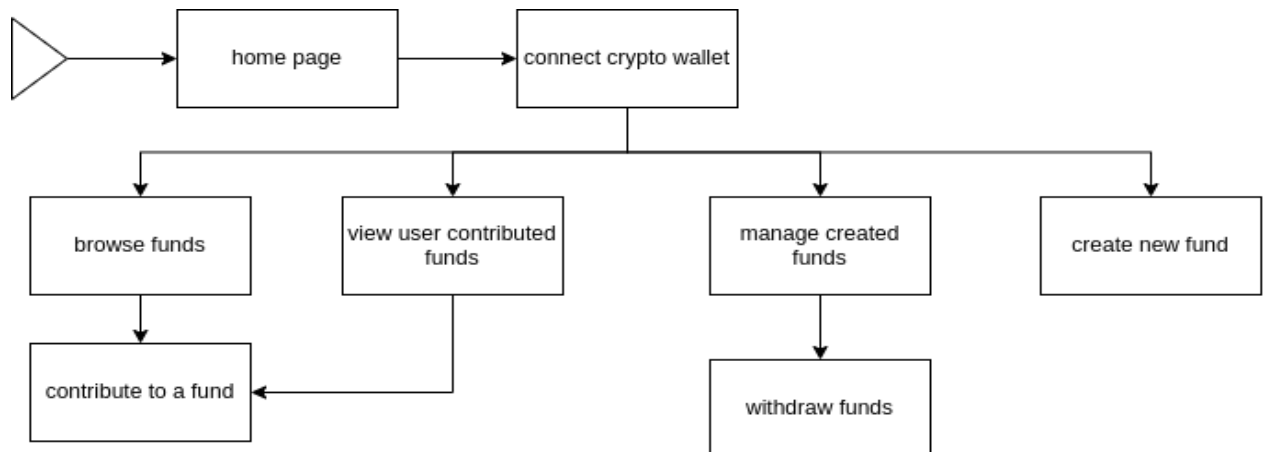


Fig 5: Overview of the system

Chapter 4

System Design

4.1 Introduction

During analysis, the focus is on what needs to be done, independent of how it is done. During design, decisions are made about how the problem will be solved, first at high level, then at increasingly detailed levels.

System design is the first design stage in which the basic approach to solving the problem is selected. During system design, the overall structure and style are decided. The system architecture is the overall organization of the system into components called subsystems. The architecture provides the context in which more detailed decisions are made in later design stages. By making high level decisions that apply to the entire system, the system designer partitions the problem into subsystems so that further work can be done by several designers working independently on different subsystems.

4.2 UML Diagrams

UML, which stands for Unified Modeling Language, is a way to visually represent the architecture, design, and implementation of complex software systems. When you're writing code, there are thousands of lines in an application, and it's difficult to keep track of the relationships and hierarchies within a software system. UML diagrams divide that software system into components and subcomponents.

4.2.1 Conceptual Workflow

The project's conceptual workflow orchestrates campaign creation, user contributions, transparent fund management, and secure interaction with the Ethereum blockchain, offering a seamless and trustworthy experience for all stakeholders.

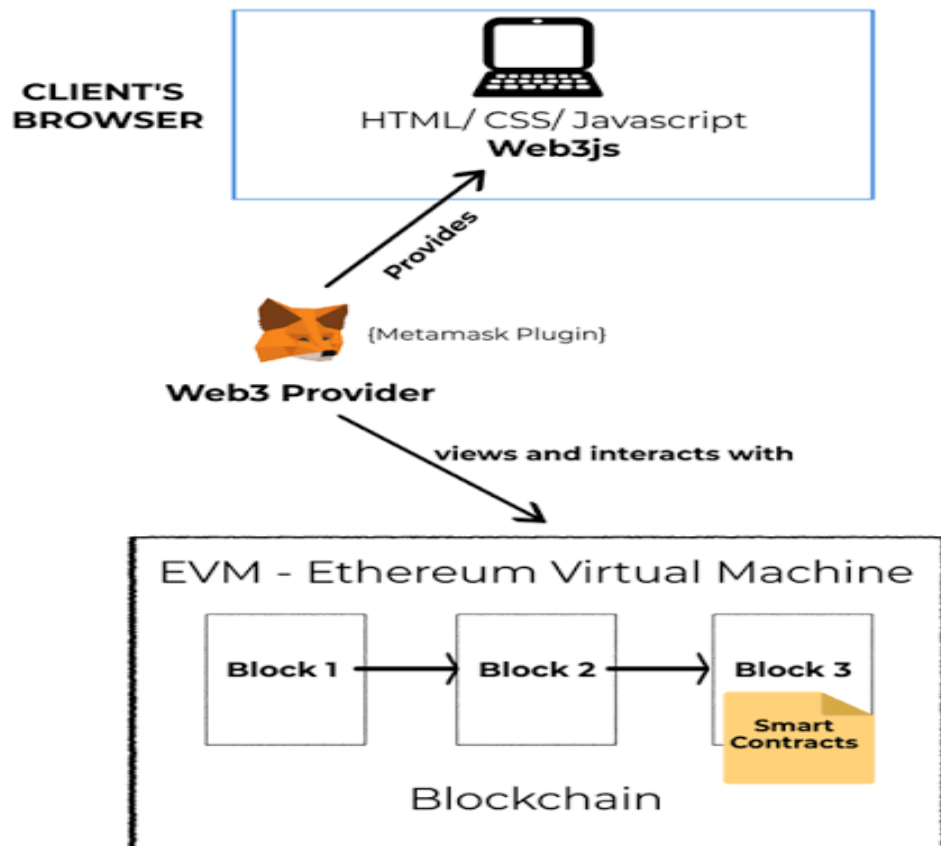


Fig 6: Conceptual Workflow

4.2.2 Class Diagram

Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application. Class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagrams are widely used in the modeling of object-oriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented languages. Class diagram shows a collection of classes, interfaces, associations, collaborations, and constraints.

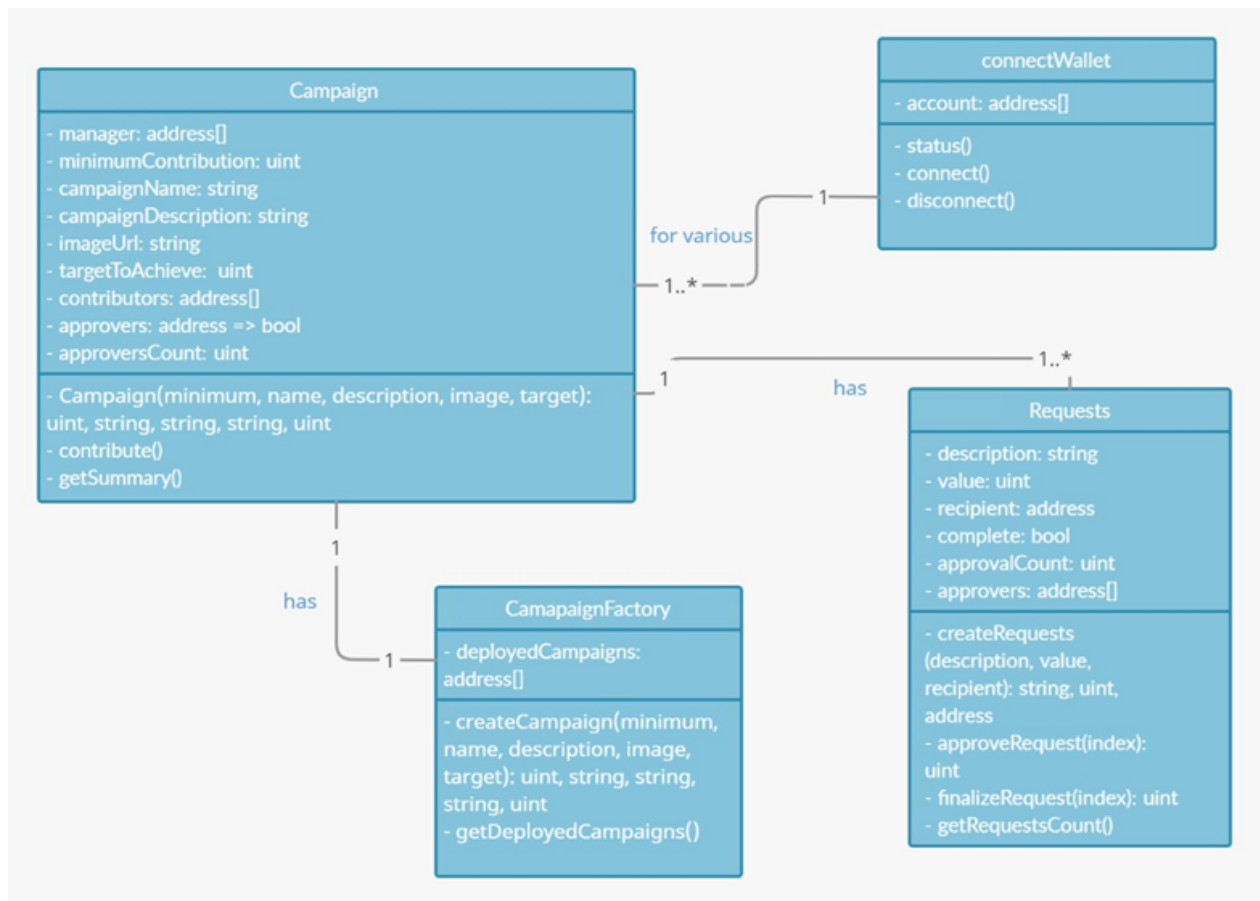


Fig 7: Class Diagram

4.3 ER Models

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how “entities” such as people, objects or concepts relate to each other within a system. ER Diagrams are most often used to design or debug relational databases in the fields of software engineering, business information systems, education and research. Also known as ERDs or ER Models, they use a defined set of symbols such as rectangles, diamonds, ovals and connecting lines to depict the interconnectedness of entities, relationships and their attributes. They mirror grammatical structure, with entities as nouns and relationships as verbs.

4.3.1 ER Diagram

ER diagrams are related to data structure diagrams (DSDs), which focus on the relationships of elements within entities instead of relationships between entities themselves. ER diagrams also are often used in conjunction with data flow diagrams (DFDs), which map out the flow of information for processes or systems.

4.3.2 Relational Schema

A database is a collection of interrelated data files or structures. It is designed to meet the various information needs of the organization. Also, it is integrated and shared. Thus, a relational database schema is an arrangement of relation states in such a manner that every relational database state fulfills the integrity constraints set on a relational database schema.

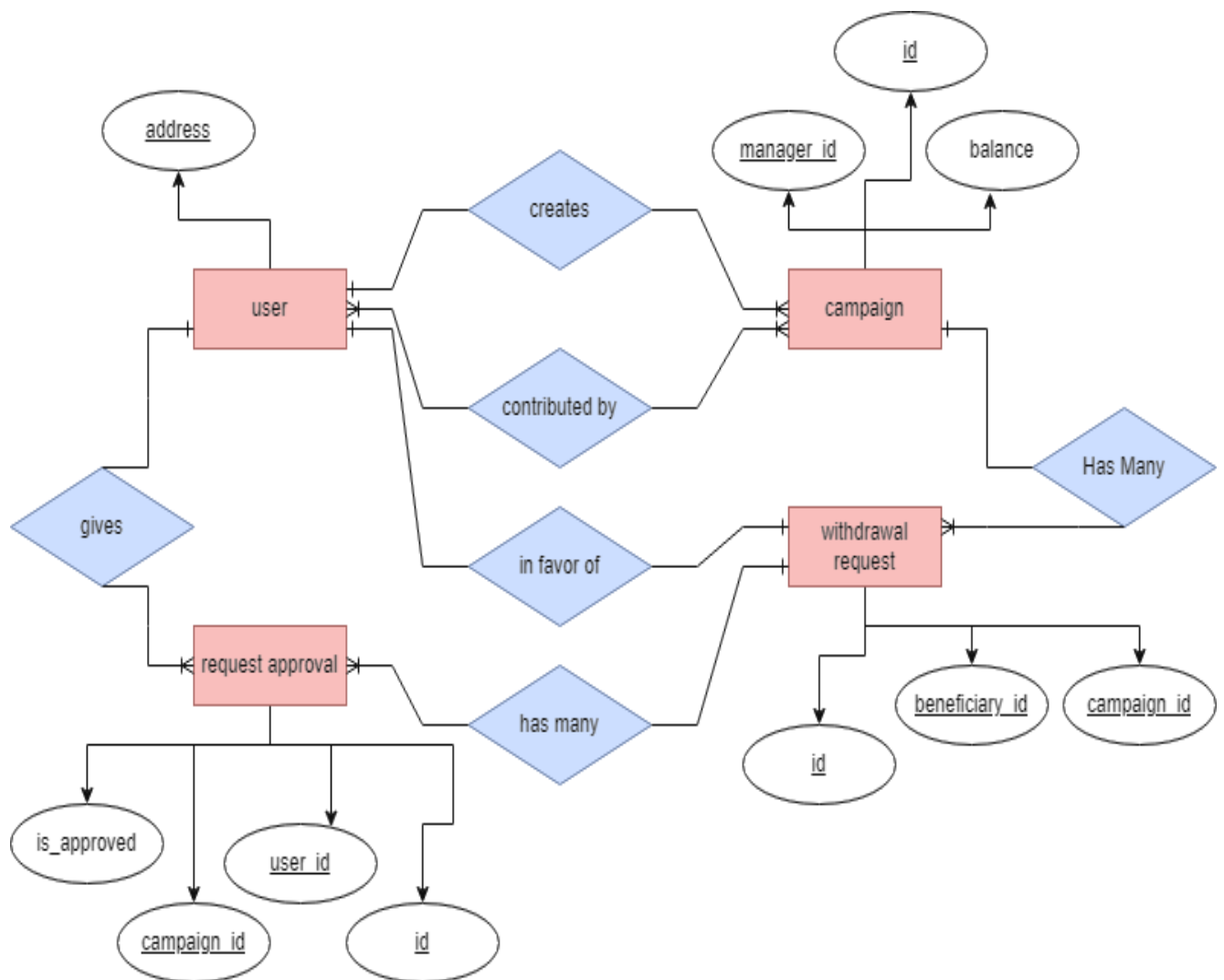


Fig 8: Relational Schema

Chapter 5

Results and Discussion

5.1 App Usage Instructions

5.1.1 Connect Wallet :

In order to perform any transactions, be it creation of a campaign or contributing to one, a user first needs to connect an Ethereum wallet to the site. We have made use of a browser extension called MetaMask to connect the wallet, which can be used to authorize transactions for cryptocurrency. The process is as shown in the below :

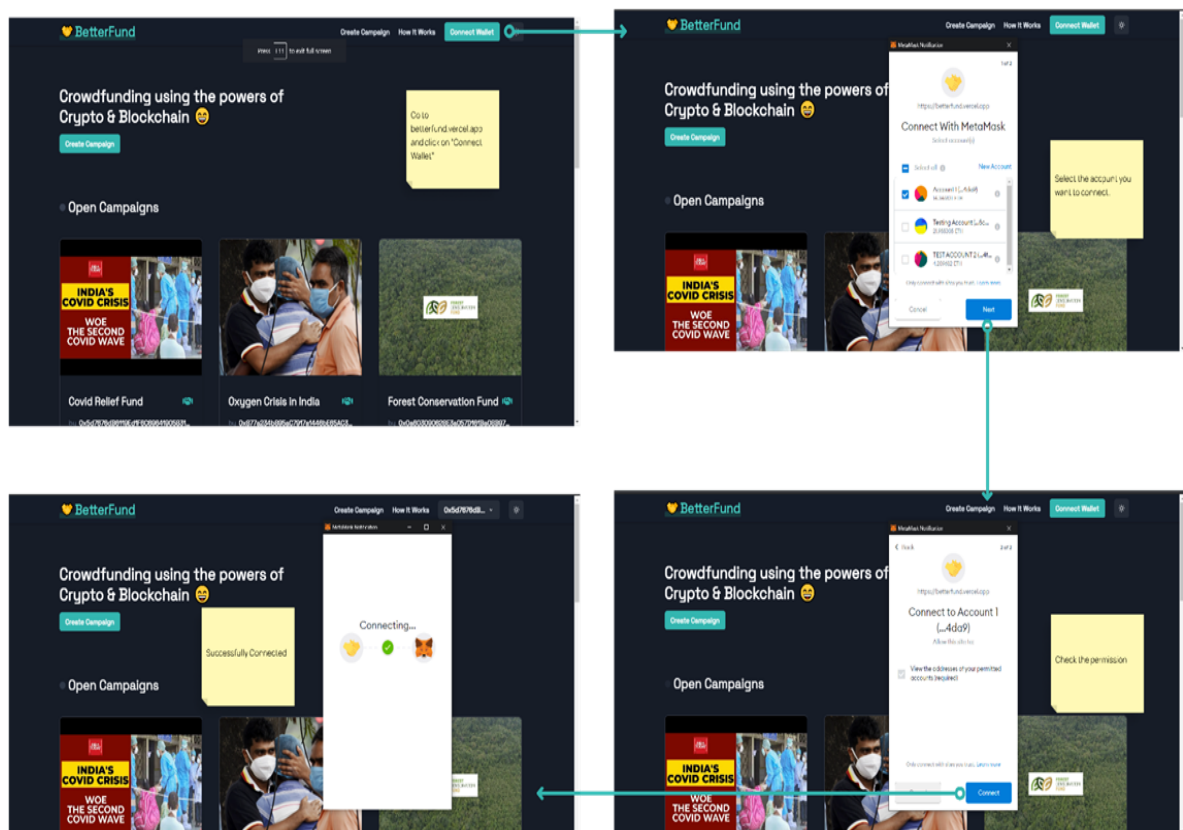


Fig 9: Flow diagram to connect a wallet

5.1.2 Creating a Campaign:

Once a wallet has been connected, anyone can create a crowdfunding campaign. The process is highly intuitive and self-explanatory, and the user only has to supply the data as asked in the forms.

The flow of the process is as shown below:

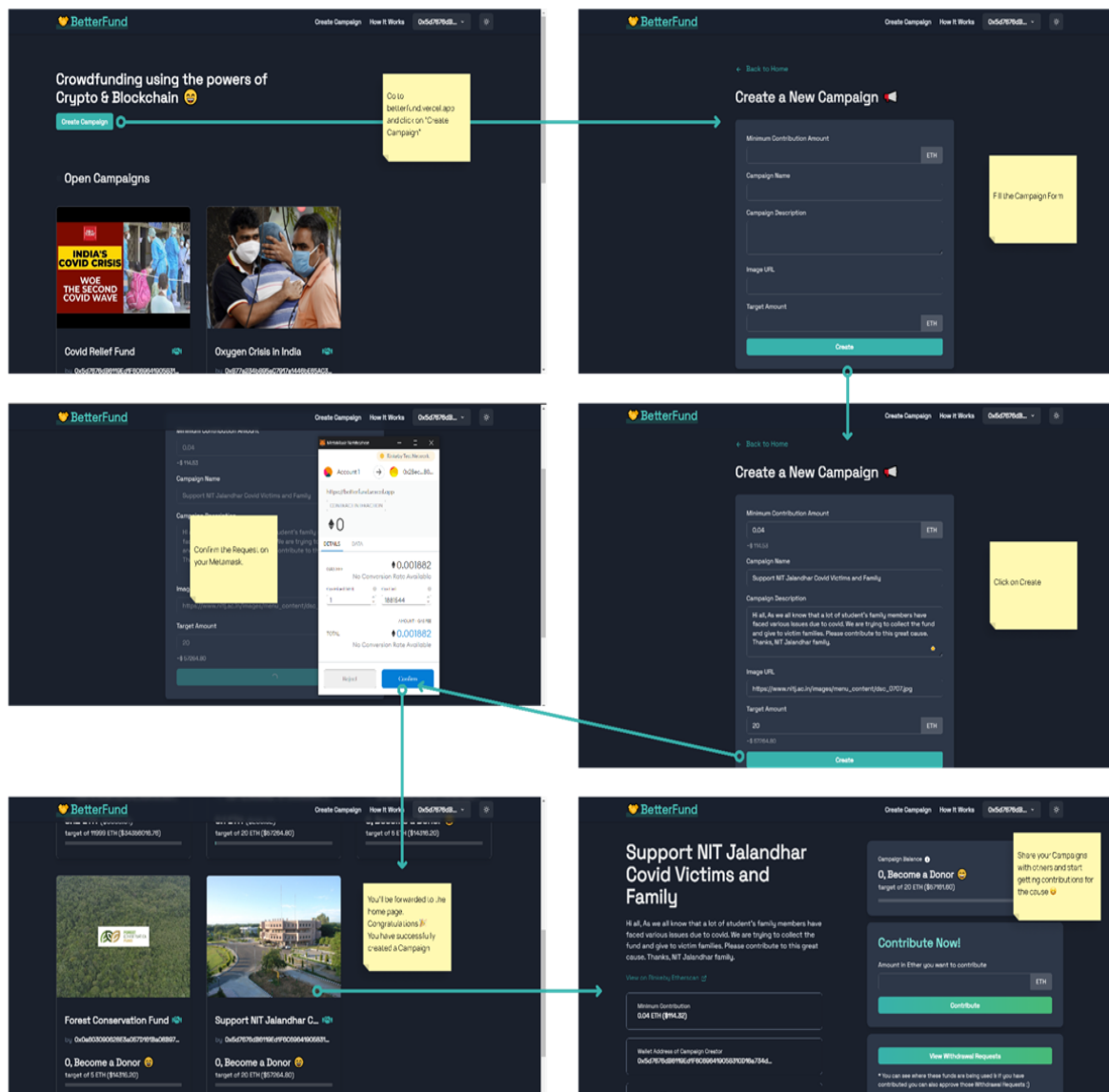


Fig 10: User journey to create a campaign

5.1.3 Contributing to a Campaign

Any user whose wallet has been connected to the app can contribute to a campaign. The process is simple and detailed in the flow below. The user only needs to select the campaign, enter the amount he wishes to contribute, and then authorize the transaction (in this case, with the MetaMask extension).

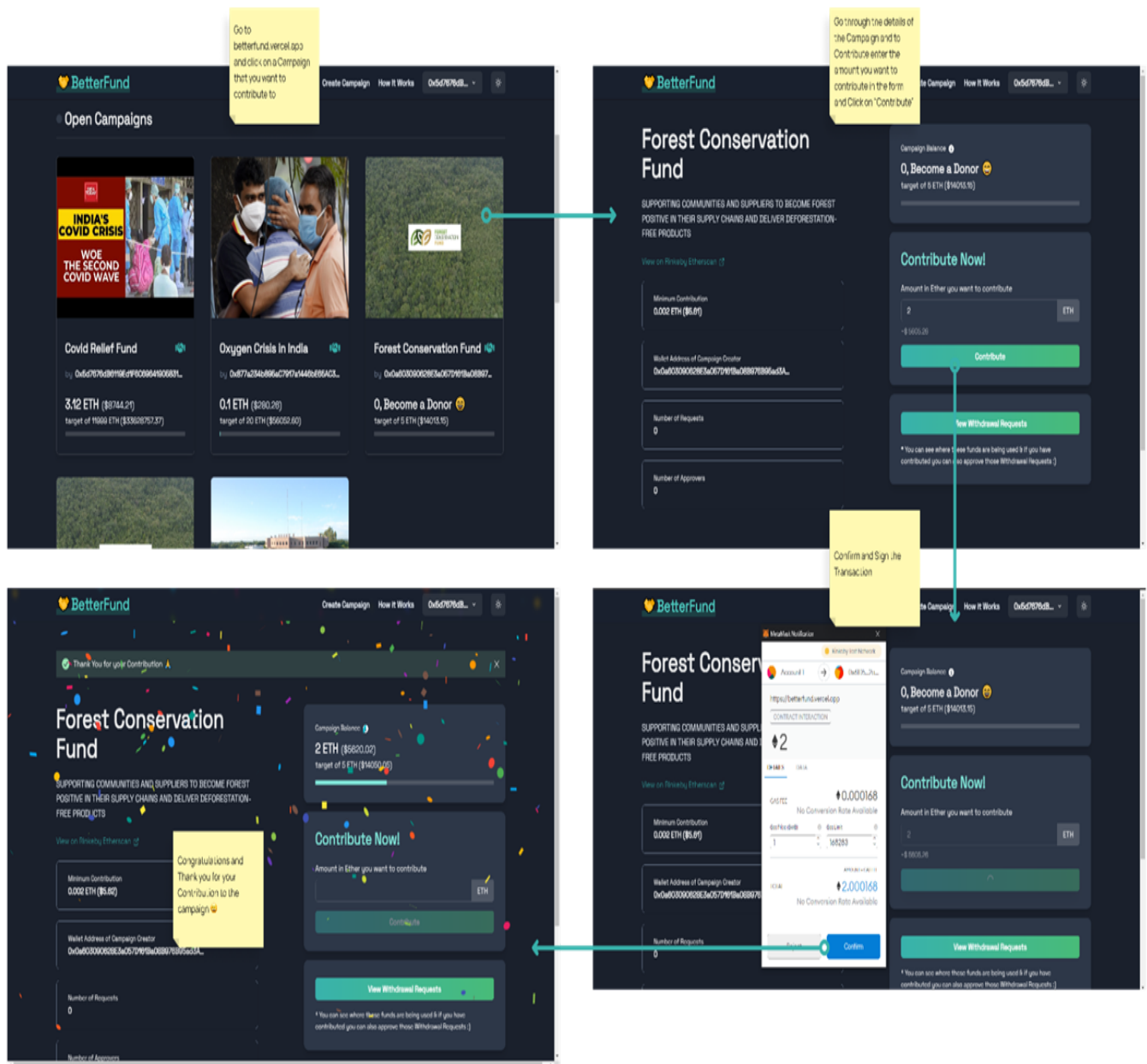


Fig 11: User journey to contribute to a campaign

5.1.4 Making a Withdrawal Request

If you are the creator of a fund, you might need to withdraw from the available funds for various reasons. You can create a Withdrawal Request by the flow given below, which must be approved by the majority of approvers.

If you are a Contributor who has contributed more than the Minimum Contribution (specified in the campaign), then you are an approver. You can vote on the Withdrawal requests made by the creator, and either approve or deny the request.

No funds can be withdrawn without the approval of at least 50% of the approvers.

5.1.4.1 The Process:

1. Click on the 'Create Withdraw Request' button on the campaign management page.
 2. Fill out the form which will ask for the amount you are requesting, the reason for the withdrawal, as well as the address to which the funds will be transferred, should the request be approved.
 3. Authorize the creation of the request with MetaMask.
 4. A page will show up which shows all the withdrawal requests for this campaign. This page is also visible to approvers of a campaign and they can approve or deny the request.
 5. Once a request has gained a majority approval, the funds can be withdrawn.
 6. Withdrawal of funds is performed and the amount is transferred directly to the payee, and not to the creator of the campaign.
- This provides complete transparency in the process of withdrawing funds. Approvers can see where their money is going. The creator is not the intermediary of the transfer of funds.

Chapter 6

Conclusion and Future Scope

6.1 Conclusion

We are pleased to announce the successful completion and launch of our project, "BetterFund: Crowdfunding Platform powered by Blockchain." The project represents a significant step forward in the world of online crowdfunding, addressing longstanding issues of transparency and fraud that have plagued conventional methods.

Our primary objective was to establish a platform that embodies transparency and trust while being decentralized and secure. We are delighted to report that this objective has been substantially realized. By tackling the vulnerabilities of traditional crowdfunding platforms, we have created a solution that empowers individuals to contribute to noble causes without apprehensions of fraud.

The "BetterFund" platform offers a robust, anti-fraudulent, and transparent environment, thanks to the innovative implementation of blockchain technology. This cutting-edge approach not only safeguards contributions but also ensures that the utilization of funds is fully transparent. It marks a significant leap forward in the evolution of crowdfunding, one that places the power of giving securely in the hands of the contributors.

We firmly believe that this project stands as a testament to the positive impact technology can have in reshaping and enhancing the way individuals and organizations come together to support meaningful initiatives. As we step into this new era of crowdfunding, we are excited to witness the transformative potential of "BetterFund" as it empowers individuals to be the change they wish to see in the world.

We extend our heartfelt gratitude to all those who have been part of this journey, from the visionary minds behind the project to the dedicated developers, and to the users who believe in our mission. "BetterFund" is not just a platform; it's a movement towards positive change. We look forward to the positive impact that "BetterFund" will bring to the world of crowdfunding and philanthropy, where trust, transparency, and collective action unite to make dreams a reality.

6.2 Future Scope

The Future enhancements of this project include the following:

- **Diversification of Cryptocurrencies:** Integrate support for a wider range of cryptocurrencies, enhancing flexibility for users and enabling them to contribute using their preferred digital assets.
- **Blockchain Enhancements:** Continuously adapt to evolving blockchain technologies to ensure scalability, speed, and reduced transaction costs.
- **AI and Machine Learning Integration:** Explore the integration of AI and machine learning algorithms to improve campaign recommendations, fraud detection, and user engagement, providing a more personalized experience.
- **Niche Campaign Categories:** Expand campaign categories to encompass a broader range of causes, such as environmental conservation, art, and technology innovation, catering to a wider spectrum of interests.
- **Partnerships with NGOs and Corporations:** Collaborate with non-governmental organizations (NGOs) and corporations to amplify the impact of campaigns, enabling large-scale humanitarian efforts and corporate social responsibility initiatives.
- **Mobile App Development:** Consider the development of a dedicated mobile application to enhance user accessibility and convenience, allowing users to engage with the platform from their smartphones and tablets.
- **Community Building:** Foster a sense of community among users through forums, social features, and real-world events to encourage collaboration and support for campaigns.
- **Blockchain Integration Beyond Crowdfunding:** Explore the use of blockchain technology for applications beyond crowdfunding, such as supply chain management, governance, and digital identity.

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