

Online Fund Raiser using Blockchain

Dr Jayasheela C S, Pruthwik Gowda, Mohan Raj C R, Snajay M N, Syed Mahdi Ali,
Department of Information Science and Engineering, Bangalore Institute of Technology.
Bangalore Institute of Technology, V.V Puram, Bangalore.

Abstract--This paper presents a novel approach to addressing trust, transparency, and accessibility issues in traditional crowdfunding systems by leveraging blockchain technology. The current crowdfunding landscape faces significant challenges such as fraudulent activities, lack of transparency in fund usage, and exclusion of contributors unfamiliar with cryptocurrency. Our proposed platform combines decentralized blockchain-based smart contracts with Unified Payments Interface (UPI) integration to provide a secure, transparent, and user-friendly crowdfunding experience.

The platform's key features include secure wallet connectivity through ThirdWeb for seamless interaction with blockchain smart contracts, automated fund management via Solidity, and UPI integration to cater to users relying on fiat currencies. The solution bridges the gap between blockchain's transparency and the accessibility of traditional payment systems, allowing users to contribute using cryptocurrency or UPI-based QR codes. Implementation results demonstrate the effectiveness of the hybrid system in ensuring trust and enhancing user convenience. With these features, the platform has the potential to significantly improve crowdfunding dynamics, making it a more reliable and inclusive process. This paper highlights the system's design, implementation, and evaluation, emphasizing its potential to revolutionize crowdfunding.

Keywords – Blockchain, crowdfunding, decentralized, solidity, UPI

I. INTRODUCTION

Crowdfunding has become an essential mechanism for funding projects, innovations, and social causes in the digital era. Platforms like Kickstarter and GoFundMe have enabled individuals and organizations to raise funds globally. However, these traditional platforms suffer from several limitations, including a lack of transparency in how funds are used, high transaction fees, and restricted access to users who lack international payment methods. Furthermore, contributors often hesitate to support campaigns due to concerns over misuse of funds or fraudulent activities.

Blockchain technology, known for its decentralized and transparent nature, offers a promising solution to these challenges. By employing smart contracts, key processes such as campaign creation, fund collection, and disbursement can be automated and made tamper-proof. However, existing blockchain-based crowdfunding systems primarily rely on cryptocurrency, which limits accessibility for non-crypto users. Our proposed platform aims to address these gaps by integrating UPI—a widely adopted fiat payment system—to broaden accessibility while maintaining blockchain's security and transparency.

This paper explores the design and development of hybrid crowdfunding platform that leverages blockchain and UPI to ensure trust, transparency, and accessibility. We detail the platform's architecture, features, and implementation, showcasing its potential to revolutionize crowdfunding by addressing the shortcomings of existing systems. By integrating blockchain's immutability and transparency with the widespread adoption of UPI, the platform democratizes crowdfunding, making it inclusive for a diverse range of users. Additionally, the platform's decentralized nature reduces operational costs, offering a more efficient alternative to traditional systems.

A. Purpose

The primary purpose of this system is to provide a personalized, efficient, and data-driven approach to exam preparation. Traditional exam preparation methods, where students rely on past experience, outdated materials, or generic study guides, can often be ineffective and time-consuming. This recommendation system uses HDBSCAN to cluster similar questions from historical question papers and provides students with a curated list of the most relevant questions.

The primary objective of this project is to develop a secure, transparent, and accessible crowdfunding platform that combines the strengths of blockchain technology with the familiarity and convenience of fiat payment systems like UPI. Traditional crowdfunding platforms often lack mechanisms to guarantee transparency in fund allocation, leading to trust issues among contributors. Additionally, platforms relying solely on cryptocurrency exclude a significant portion of potential users unfamiliar with digital assets.

By introducing a hybrid solution, this project addresses these shortcomings. The platform provides:

1. **Transparency:** Immutable records of transactions through blockchain, accessible to all stakeholders.
2. **Security:** Automated fund handling via smart contracts eliminates manual intervention and associated risks.
3. **Accessibility:** UPI integration ensures contributions from fiat currency users while maintaining the option for cryptocurrency payments.
4. **User Convenience:** An intuitive user interface simplifies campaign creation and contribution processes.
5. **Cost Efficiency:** The elimination of intermediaries reduces transaction fees and ensures that more funds reach campaign creators.

This approach not only enhances the credibility of crowdfunding campaigns but also democratizes participation by accommodating both crypto-savvy users and those reliant on traditional payment methods. The purpose of this system extends beyond technology by addressing the societal need for equitable and trustworthy crowdfunding mechanisms. By catering to diverse user bases, the platform fosters inclusivity and aligns with the broader goal of financial democratization.

B. System Overview

The system architecture is designed to integrate blockchain functionality with traditional payment methods seamlessly. The platform consists of the following core components:

1. Frontend: Built using ReactJS, the frontend serves as the user interface for campaign creators and contributors. It enables users to create campaigns, view active campaigns, and make contributions. The design emphasizes simplicity and accessibility, ensuring a positive user experience for both crypto-savvy and fiat users.
2. Backend: Developed using NodeJS and ExpressJS, the backend coordinates data flow between the frontend and the blockchain. It also handles UPI QR code generation for fiat contributions. The backend's modular structure allows for future integration of additional payment methods. It serves as a bridge, ensuring real-time synchronization between the user-facing frontend and the blockchain ledger.
3. Blockchain Integration: ThirdWeb is utilized to deploy and interact with Solidity smart contracts. These contracts manage campaign creation, contribution tracking, and automated fund disbursement. Smart contract functions are exposed via APIs for seamless interaction with the frontend. The blockchain ensures transparency by maintaining an immutable record of all transactions, fostering trust among users.
4. Testing Environment: Remix IDE is employed to test and debug smart contracts, ensuring their reliability before deployment. The IDE's simulation capabilities enable thorough verification of contract logic under various scenarios, ensuring robustness and security.

II. PROPOSED SYSTEM

The proposed system is a hybrid crowdfunding platform designed to address the challenges of trust, transparency, and accessibility in traditional and cryptocurrency-based crowdfunding systems. By integrating blockchain technology with Unified Payments Interface (UPI), the platform ensures a secure, transparent, and inclusive fundraising experience. The key components and features of the proposed system are outlined below:

Key Components

1. Smart Contracts: Developed using Solidity, these contracts automate core processes, including campaign creation, fund contribution tracking, and disbursement. Smart contracts ensure immutability and transparency by recording all transactions on the blockchain, accessible for verification by any user. Campaign conditions such as funding goals, deadlines, and withdrawal rules are enforced programmatically to eliminate manual intervention.
2. Blockchain Integration: Leveraging ThirdWeb, the system facilitates seamless wallet connectivity and interaction with smart contracts. Blockchain serves as the foundation for maintaining a tamper-proof ledger of all crowdfunding transactions, ensuring trust among users.
3. UPI Payment Integration: The platform incorporates UPI payment functionality to enhance accessibility for users unfamiliar with cryptocurrencies. UPI-based QR codes are generated on the backend using an NPM package, enabling contributors to make fiat currency payments directly to campaigns. The hybrid payment system bridges the gap between crypto and non-crypto users, expanding the platform's reach.
4. Frontend Development: Built using ReactJS, the frontend provides a user-friendly interface for campaign creators and contributors. Key functionalities include campaign creation, browsing active campaigns, viewing campaign details, and contributing via cryptocurrency or UPI. The interface ensures a seamless user experience, accommodating both tech-savvy and non-technical users.
5. Backend Development: Implemented using NodeJS and ExpressJS, the backend manages data flow between the frontend and blockchain. Responsibilities include UPI QR code generation, transaction validation, and ensuring real-time synchronization of campaign data. The modular design enables future scalability and integration with additional payment gateways.
6. Testing and Debugging: Smart contracts are rigorously tested and debugged using Remix IDE to ensure reliability and robustness. Comprehensive testing scenarios validate contract logic and security, minimizing risks of errors or exploits post-deployment.

III. SYSTEM DESIGN

A. Architectural Design

The system is built with the following architectural components:

1. Data Preprocessing Module
 - Converts question papers from PDF format into images using tools like pdf2image.
 - Extracts text from these images using Tesseract OCR and processes it by removing noise, punctuation, and redundant characters to prepare clean data.

2. Embedding Module
 - Transforms processed text into embeddings using Sentence Transformers.
 - These embeddings are high-dimensional vectors that capture the semantic meaning of the questions, making it possible to compare their similarities effectively.
3. Clustering Module
 - Applies HDBSCAN to the embeddings to cluster similar questions.
 - Automatically adjusts cluster density and identifies outliers (noise) to improve cluster quality

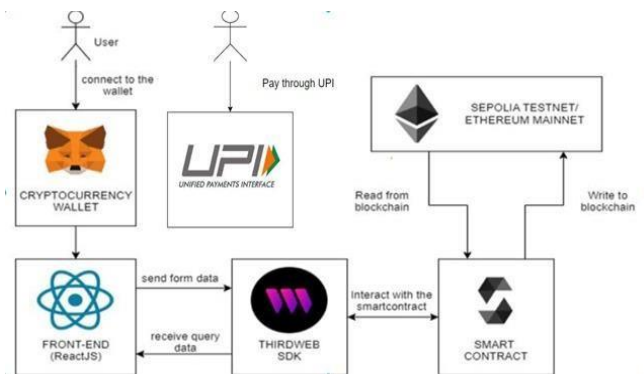


Figure 2 :Architectural Design

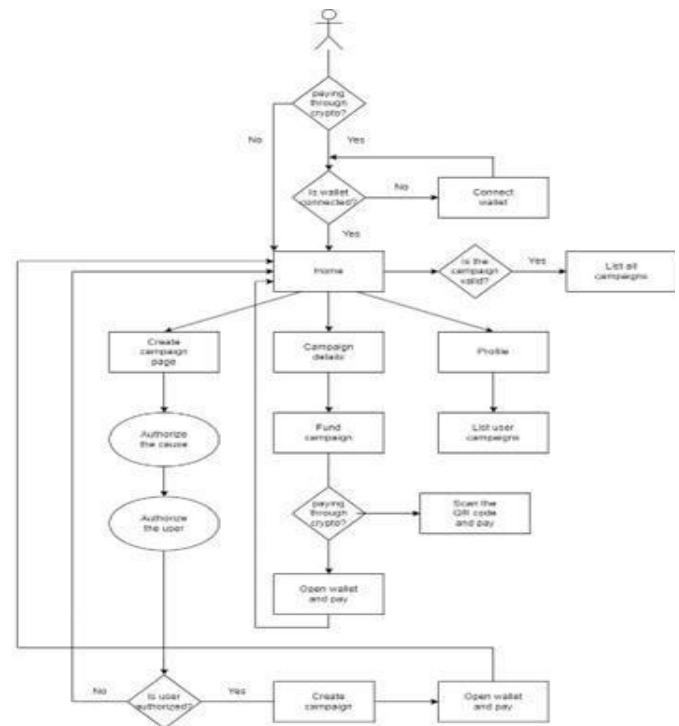


Figure 3 Dataflow Diagram

B. Data Flow Diagram

The DFD illustrates the key processes involved in the platform's operation:

1. Wallet Connection: Users begin by deciding whether to pay through cryptocurrency. If yes, they are prompted to connect their wallet. Once the wallet is connected, users can proceed to interact with the platform.
2. Create Campaign: Users navigate to the "Create Campaign" page, where they authorize the cause and themselves. Upon successful authorization, the campaign is created on the blockchain.
3. Fund Campaign: Users can fund a campaign by scanning the provided QR code or directly opening their wallet to pay. The transaction is recorded on the blockchain.
4. Campaign Interaction: Users can view campaign details, list all available campaigns, or check their own campaigns through their profile.
5. Blockchain Integration: Each interaction, such as creating or funding campaigns, involves recording and retrieving data securely from the blockchain, ensuring transparency and trust. The below Figure 3 shows the Dataflow Diagram

C. Sequence Diagram

Three sequence diagrams illustrate the system's actions:

1. Create Campaign: User initiates a "Create Campaign" request. The Platform opens the user's Wallet, the payment of the works, and written the campaign creation to the Blockchain. The Blockchain Confirms the creation, and the Platform informs the user.
2. Fund Campaign: User initiates a "Fund Campaign" request. The Platform opens the user's Wallet, the payment of the works, and the fact that the funding transaction to the Blockchain. The Blockchain Confirms the transaction, and the Platform informs the user.
3. Get Campaign Details: User requests "Get Campaign Details." The Platform reads the campaign details from the Blockchain and sends them to the user

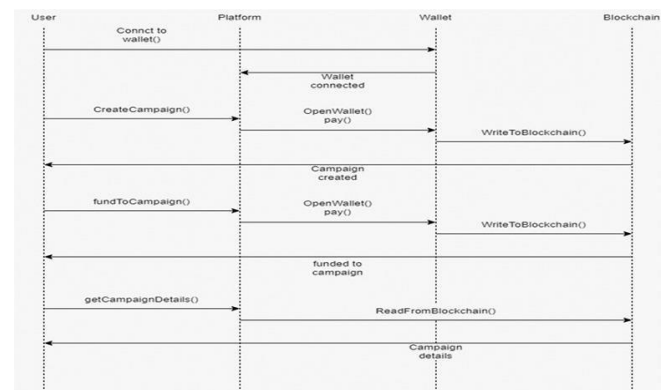


Figure 4: Sequence Diagram

IV. RESULTS

The platform's effectiveness was evaluated based on transparency, accessibility, efficiency, and user satisfaction. Results from the implementation include:

1. **Enhanced Transparency:** Contributors can track every transaction and fund allocation through the blockchain ledger. This transparency eliminates ambiguities and fosters trust among users.
2. **Broadened Accessibility:** UPI integration allows users unfamiliar with cryptocurrency to contribute seamlessly, expanding the platform's reach. This hybrid approach ensures inclusivity, making the platform accessible to a diverse user base.
3. **Operational Efficiency:** Automated processes reduce administrative overhead and speed up fund disbursement, ensuring timely campaign outcomes. The elimination of intermediaries also reduces operational costs, making the system more efficient.
4. **User Satisfaction:** Initial user feedback highlights the platform's ease of use and the confidence gained from blockchain's transparency. Users appreciate the dual payment options, which cater to different levels of technological proficiency.
5. **Security Assurance:** Smart contracts eliminate the risk of fund mismanagement, providing contributors with confidence in the system. The immutability of blockchain transactions further strengthens the platform's security.

These results underscore the platform's potential to transform crowdfunding by addressing longstanding issues in traditional systems. The hybrid approach bridges the digital divide, enabling diverse users to participate and benefit from a transparent and secure funding mechanism. Furthermore, the platform's scalability ensures its applicability to various types of campaigns, from small-scale projects to large-scale initiatives.

V. CONCLUSION

This paper presents a hybrid crowdfunding platform that combines the transparency and security of blockchain with the accessibility of UPI payments. By addressing the limitations of both traditional and blockchain-exclusive crowdfunding systems, the proposed solution offers a robust, user-friendly alternative for campaign creators and contributors.

The integration of smart contracts ensures trust and accountability, while UPI payments make the platform accessible to a wider audience. Future work includes expanding payment options, optimizing scalability, and exploring partnerships with payment gateways to support global adoption. This platform represents a significant advancement in crowdfunding technology, promising a more equitable and efficient fundraising process for all stakeholders.

In conclusion, the proposed system not only bridges technological gaps but also contributes to societal progress by democratizing access to crowdfunding. The hybrid model's emphasis on trust, transparency, and accessibility positions it as a transformative solution in the evolving landscape of digital finance. Further research and development will focus on enhancing user experience and scalability, ensuring the platform's relevance in a rapidly changing technological environment.

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