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# Crowdfunding: A Decentralized Application for Trustworthy Fundraising

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**Abstract -** In an era where traditional funding models often fail to meet the needs of emerging projects and startups, a decentralized crowdfunding platform built on blockchain technology offers a transformative solution. This platform connects innovators with a global network of contributors, enabling secure, transparent, and efficient fundraising without intermediaries. Leveraging smart contracts, transactions are automated, ensuring that funds are released only when predefined conditions are met, minimizing risks and enhancing accountability. Designed to empower creators across diverse sectors—such as technology, arts, and social impact—this decentralized application (dApp) facilitates seamless project promotion, financial management, and direct engagement with backers. The integration of blockchain technology ensures immutability, traceability, and security, providing contributors with confidence in the integrity of the funding process. Through a streamlined interface, creators can share their vision using compelling storytelling and multimedia content, attracting supporters who believe in their mission. By harnessing the power of decentralized technology, this platform democratizes access to funding, fosters innovation, and nurtures a thriving ecosystem where ideas can flourish. It serves not only as a funding avenue but also as a collaborative space where innovators and supporters unite to turn visionary ideas into reality.

***Key Words*:** *Crowdfunding, Smart Contract, Blockchain, Decentralized application(Dapp), Metamask*

## 1.INTRODUCTION

The emergence of **blockchain technology** has revolutionized multiple industries, including **crowdfunding**, by offering decentralized, secure, and transparent solutions. Traditional crowdfunding platforms, although effective in raising funds, face several limitations such as high service fees, lack of transparency, delays in fund disbursement, and the risk of fraudulent campaigns. Moreover, contributors often have minimal control over how their funds are managed, leading to reduced trust in centralized platforms. To overcome these challenges, **blockchain-based crowdfunding platforms** (DApps) leverage smart contracts and distributed ledgers to automate processes, ensure transparency, and reduce intermediary involvement.

### 1.1 Need for Blockchain-Based Crowdfunding Solutions

Conventional crowdfunding models are heavily dependent on centralized entities that mediate between project creators and contributors. This centralized approach introduces several inefficiencies:

**High Transaction Fees:** Platform providers often deduct a significant percentage of the raised funds, reducing the net amount available to project creators.

**Lack of Transparency:** Backers have limited access to information about fund utilization and project milestones.

**Delayed Fund Disbursement:** Manual fund processing may delay project development timelines.

**Increased Risk of Fraud:** Centralized control makes the platform vulnerable to scams and mismanagement of funds.

A **blockchain-based crowdfunding DApp** addresses these challenges by utilizing **smart contracts** to facilitate automated and transparent fund management. These contracts ensure that funds are released only after predefined conditions are met, providing backers with assurance and project creators with reliable access to funding. Additionally, blockchain's immutability ensures that all transactions and project-related data remain secure and verifiable.

### 1.2 Key Advantages of Blockchain in Crowdfunding

Integrating blockchain technology into crowdfunding platforms offers numerous benefits, including:

**Transparency and Trust:** Every transaction and project milestone is recorded on the blockchain, allowing backers to verify the progress and use of funds.

**Automation through Smart Contracts:** Smart contracts automatically execute agreements between contributors and project creators, ensuring timely fund disbursement upon achieving milestones.

**Reduced Transaction Costs:** By eliminating intermediaries, blockchain reduces operational and service fees, allowing more funds to reach the project.

**Fraud Prevention and Security:** Blockchain's immutable ledger and consensus mechanisms protect the platform from fraud and unauthorized alterations.

**Global Accessibility:** Blockchain enables contributors from around the world to participate, broadening the reach and impact of crowdfunding campaigns.

### 1.3 Literature survey

The rapid growth of decentralized crowdfunding has transformed fundraising, offering transparency and accessibility. However, challenges such as fraud, fund mismanagement, and lack of accountability remain significant concerns. This has led to a growing demand for blockchain-based crowdfunding solutions that ensure security, trust, and automated fund distribution through smart contracts. Some of the related crowdfunding are listed below:

**"Recent Advances in Applications of Machine Learning in Reward Crowdfunding Success Forecasting" (2024)** This study applies machine learning to predict the success of reward-based crowdfunding campaigns. It introduces a dynamic selection framework to improve accuracy, with ensemble models, especially Meta-DES, outperforming traditional classifiers. Using SHAP, the research identifies key success factors like media sentiment, pledge count, and target amount. The findings highlight machine learning's potential in optimizing crowdfunding strategies.

**"Success or Failure of Online Crowdfunding: Exploring the Impact of Project Characteristics and Market Competition" (2024)** This study examines how project characteristics and market competition influence the success of online crowdfunding campaigns. Utilizing data from 330,995 Kickstarter projects, the researchers employed logistic regression analysis, incorporating the Herfindahl–Hirschman Index (HHI) to quantify market competition. The findings reveal that factors such as funding goal, campaign duration, and number of backers significantly affect crowdfunding success, with market competition levels positively moderating these relationships. This research underscores the importance of considering market dynamics alongside project attributes to enhance the effectiveness of crowdfunding initiatives.

**"Reward Crowdfunding Campaigns: Time-to-Success Analysis" (2022)** This study investigates factors influencing the time-to-success of reward-based crowdfunding campaigns. Analyzing data from over 4,200 campaigns on Brazil's largest crowdfunding platform, the researchers employed parametric and semi-parametric survival analysis models to identify determinants affecting how quickly campaigns reach their funding goals. The findings indicate that campaigns with lower fundraising targets and a higher number of pledges tend to achieve success more rapidly. Additionally, campaigns based in cities with greater income inequality experience shorter time-to-success, suggesting that socioeconomic factors play a role in crowdfunding dynamics. The study also reveals that the influence of these determinants is not constant throughout the fundraising period, emphasizing the need for dynamic campaign strategies. These insights provide valuable guidance for entrepreneurs aiming to optimize the timing and structure of their crowdfunding efforts.

**"Crowdfunding for Cultural and Commercial Entrepreneurs" (2021)** This study explores the differences between cultural and commercial entrepreneurs in crowdfunding campaigns, analyzing their funding strategies, success rates, and the factors influencing their outcomes. Using empirical data, the researchers examine how backers perceive and support projects from these two entrepreneurial groups. The study employs statistical models to assess the impact of campaign characteristics, creator credibility, and market positioning on funding success. Findings suggest that cultural entrepreneurs often rely on community engagement and artistic appeal, whereas commercial entrepreneurs focus on business scalability and financial returns. The research highlights the importance of tailored crowdfunding strategies based on the nature of the project and target audience.

## 2. RESEARCH METHODOLOGY

### 2.1 System Architecture

The architecture of the **Blockchain-Based Crowdfunding DApp** is structured into several interconnected layers, ensuring seamless interaction between the front-end, back-end, smart contracts, and blockchain network. The diagram illustrates the workflow involving multiple technologies, where each component plays a critical role in the system's functionality. figure.1 represents the simple system architecture of the proposed system: -

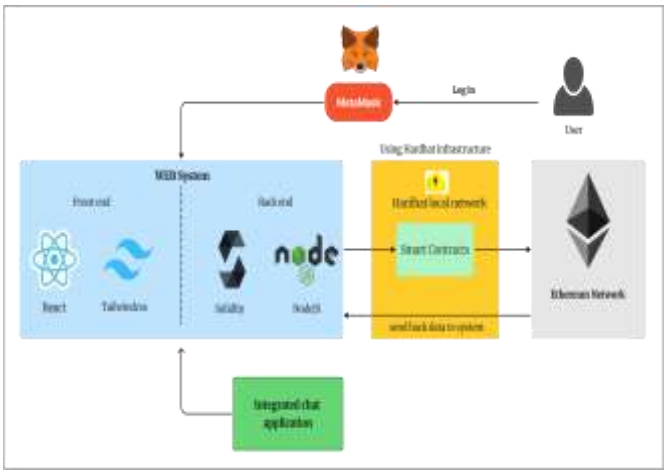


Fig 1: System Architecture

- **User Authentication and Interaction**

**Users** log in using **MetaMask**, which acts as a Web3 wallet that connects them to the decentralized application (DApp). MetaMask authenticates users using their Ethereum wallet addresses, ensuring secure and decentralized login. Once authenticated, users can browse, invest, or launch crowdfunding campaigns.

- **Frontend (Web System UI)**

The **frontend** is built using **React.js**, a popular JavaScript library for building user interfaces. **Tailwind CSS** is used for styling, ensuring a modern and responsive design. The frontend interacts with the backend via Ethers to communicate with smart contracts deployed on the blockchain.

- **Backend (Smart Contracts & Node.js)**

The backend is developed using **Node.js**, a lightweight and scalable JavaScript runtime. **Solidity smart contracts** are deployed using **Hardhat**, a powerful Ethereum development framework that enables local blockchain testing before deploying contracts to the Ethereum network.

- **Smart Contracts & Blockchain Network**

The system deploys **smart contracts** written in **Solidity**, which handle fundraising, investments, and fund disbursements based on predefined conditions. **Hardhat local network** is used for contract testing and debugging before deploying to the **Ethereum network**.

Smart contracts ensure **fund security**, **transparency**, and **automated fund releases** once funding goals are met.

- **Ethereum Network**

The final deployment of smart contracts happens on the **Ethereum blockchain**, ensuring decentralization and immutability. Transactions related to fundraising, investments, and fund withdrawals are recorded permanently on the blockchain.

- **Integrated Chat Application**

A **chat application** is integrated into the system to facilitate communication between **investors and project creators**. This feature enhances transparency and engagement, allowing users to discuss projects, negotiate terms, and share updates.

### 2.2 Workflow of the System

- **User logs in via MetaMask**, connecting their wallet to the platform.
- Users can **create crowdfunding campaigns** or **invest in existing projects** using cryptocurrency.
- **Smart contracts manage funds** and ensure transactions are secure and automatic.
- If the funding goal is met, **funds are transferred to the project creator** otherwise, the funds can be refunded to contributors.
- The **chat application** enables real-time communication between project creators and backers.
- The system continuously interacts with the **Ethereum network**, keeping all transactions transparent and immutable.

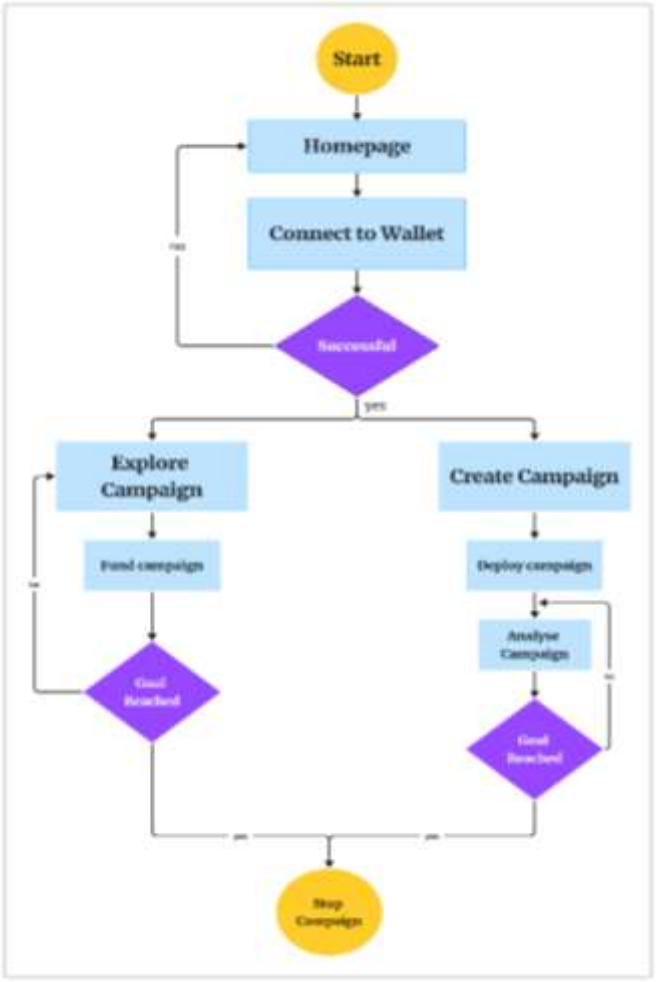


Fig 2: System Workflow

### 2.3 Difference in Existing system and Crowdfunding decentralized application

| Parameters | Existing system | Crowdfunding Dapp |
|---|---|---|
| Platform Type | Centralized | Decentralized (DApp) using Blockchain |
| Fund Management | Controlled by third-party platform | Managed via Smart Contracts |
| Fees | High platform and processing fees | Low to no fees (only gas fees) |
| Fund Release | Released by platform or manually by campaign owner | Automated Goal-based release through smart contract |
| Security | Prone to fraud, platform dependency | On-chain security, reentrancy protection, ownership checks |

Table 1 **Existing system vs Crowdfunding decentralized application**

### 2.4 Key Features

**1. Smart Contract-Based Fund Management**

**At the heart of our application is a smart contract that automates the fundraising process. It enforces predefined rules such as:**

- **Minimum and maximum funding goals**
- **Deadlines for fundraising**
- **Conditional fund release based on milestones**

**This ensures complete trustlessness, meaning that funds are only transferred if conditions are genuinely met, and no third-party control is involved.**

**2. MetaMask Wallet Integration**

**Users can interact with the application using their MetaMask wallet, which allows for:**

- **Secure authentication and identity management**
- **Sending and receiving Ethereum-based transactions**
- **Signing contract interactions directly from the browser**

**This integration ensures a seamless and user-friendly Web3 experience.**

**3. Campaign Creation Module**

**Campaign creators can initiate new fundraising campaigns by:**

- **Providing project details (title, description, image, funding goal)**
- **Setting deadlines and funding conditions**

**This module empowers innovators to showcase their ideas transparently and attract potential supporters.**

**4. Milestone-Based Fund Release**

**Unlike traditional platforms where all funds are released at once, this system includes milestone-based fund unlocking:**

- **Funds are released in parts after the successful completion of defined project phases.**
- **Backers are notified and can view progress before approving further release. This promotes accountability and better project delivery.**

**5. Backer-Creator Chat Feature**

**A built-in chat module enables direct communication between campaign backers and creators, allowing them to:**

- **Clarify project details**
- **Build trust through real-time interactions**
- **Discuss progress or concerns**

**This feature enhances community engagement and improves the decision-making process for contributors.**

## 3. RESULT AND DISCUSSIONS

The successful implementation of this **blockchain-based crowdfunding DApp** will result in a secure, transparent, and decentralized platform where project creators can raise funds efficiently, and contributors can invest with confidence. The system will automate the entire fundraising process using **smart contracts**, ensuring that funds are disbursed only when predefined conditions are met. Users will be able to log in securely using **MetaMask**, contribute to projects seamlessly, and track project milestones in real-time. Additionally, the **integrated chat application** will facilitate direct communication between investors and project creators, fostering trust and collaboration. Overall, the project will enhance transparency, eliminate intermediaries, and provide a fair and efficient crowdfunding ecosystem.

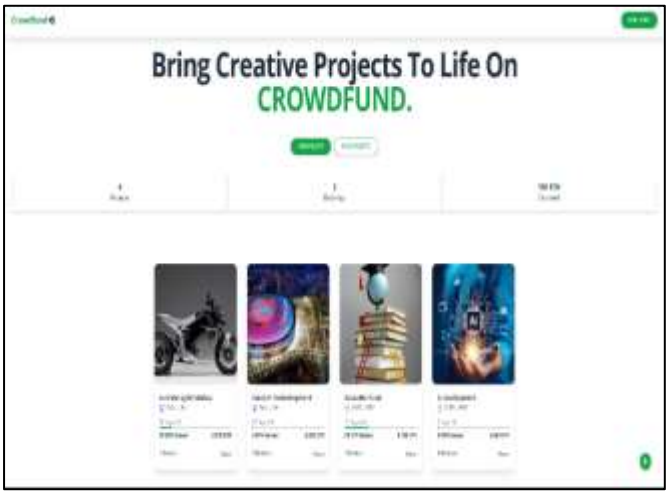


Fig 3 : Home page

Figure 3 This figure represents interface of the home page displaying the campaigns created, number of backers who have funded the project.

Figure 4 contains the interface of the detail of the campaign deployed which shows information about the campaign, various buttons like Back Project, Chat, Edit.

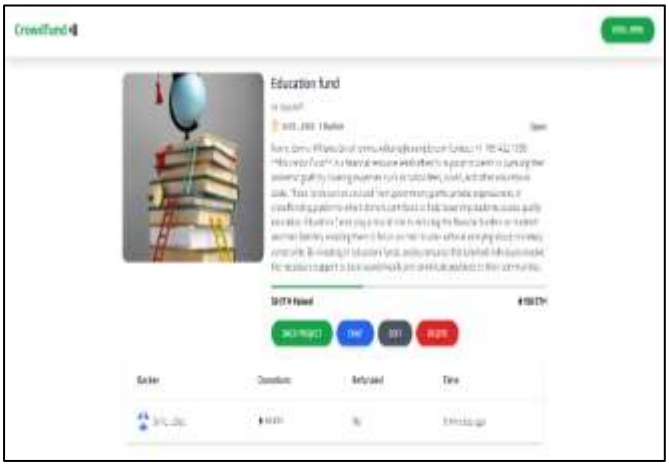


Fig 4 : Campaign detail page

Figure 5 contains the interface of the the chat application through which backers and creators can connect with each other to discuss about the fundings and purpose of campaign.

Fig 5 : chat application

### 3.1 Future Enhancements

- **Reputation System**

Implement a reputation or trust score for campaign creators based on successful past campaigns, backer reviews, and timely delivery.

- **Multi-chain Support**

Expand from Ethereum to other blockchains (e.g., Polygon, Binance Smart Chain) to reduce gas fees and reach more users.

- **Live Video Sessions**

Integrate live video Q&A between campaign creators and potential backers for better trust and transparency.

## 4. CONCLUSIONS

This crowdfunding DApp offers a modern and efficient solution to the challenges faced by conventional fundraising platforms. By utilizing smart contracts to automate processes and ensure trust, it minimizes the risk of misuse and guarantees that contributions are managed as per the agreed terms. The integration of MetaMask simplifies user authentication and transaction approval, while the built-in chat feature promotes seamless communication between investors and project initiators. This decentralized platform not only enhances security and transparency but also provides a streamlined and engaging experience for all participants, paving the way for more reliable and innovative funding opportunities.

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## REFERENCES

1. Cavalcanti, G.D.C., Mendes-Da-Silva, W., dos Santos Felipe, I.J. et al. Recent advances in applications of machine learning in reward crowdfunding success forecasting. Neural Comput & Applic 36, 16485–16501 (2024)
2. Wang, M., Zhang, J., Wang, F. et al. Success or failure of online crowdfunding: exploring the impact of project characteristics and market competition. Electron Commer Res (2024)10660-024 098849
3. Li, Y., Cabano, F., & Li, P. (2023). How to attract low prosocial funders in crowdfunding? Matching among funders, project descriptions, and platform types. Information and Management, 60(7), 103840.
4. Mendes-Da-Silva W, Felipe I, Leal CC, Aguiar MO (2022) How the tone of mass media news affects pledge amounts in reward crowdfunding campaigns. J Small Bus Manag 62:254
5. Bürger, T., Kleinert, S. Crowdfunding cultural and commercial entrepreneurs: an empirical study on motivation in distinct backer communities. *Small Bus Econ* **57**, 667–683 (2021).
6. Bogusz CI, Teigland R, Vaast E (2021) Designed entrepreneurial legitimacy: the case of a Swedish crowdfunding platform. Eur J Inf Syst 28:318–335