



Blockchain-Based Crowdfunding Platform

¹Prof. Priyanka Bhilare, ²Atharva Vichare, ³Ankit Prajapati, ⁴Akshay Utekar, ⁵Yogesh Raut

Department of Computer Engineering
Rajiv Gandhi Institute of Technology, Mumbai, India

Abstract: The advent of crowdfunding has revolutionized fundraising; It has allowed individuals and organizations to get support for their businesses like never before. This dynamic fundraising approach, powered by online platforms and social media channels, allows entrepreneurs and nonprofits to connect with a wide range of potential supporters around the world. At the heart of a successful crowdfunding campaign are quality and trust, enhanced by the integration of blockchain technology. Leveraging the decentralized structure of blockchain, fundraising reaches a new level of transparency and fairness, increasing trust between both donors and recipients. The emergence of decentralized autonomous organizations (DAOs) is further disrupting fundraising models and funneling capital into blockchain-powered startups. This change leads to financial freedom by overcoming the restrictions imposed by the middle class, making financial freedom more integrated, and flexible. The combination of crowdfunding and blockchain technology represents a fundamental shift in fundraising, promising significant growth and social impact heralding exciting new times in fundraising.

Keywords— Blockchain, DAOs, Decentralized, Transparency.

I. INTRODUCTION

Crowdfunding platforms have ushered in a significant paradigm shift, offering newfound freedom in fundraising for individuals and businesses across diverse projects and initiatives. However, despite their inherent flexibility, these platforms often grapple with limitations stemming from their centralized nature. Challenges such as opaque transactions, hefty user fees, and restrictive policies have become recurrent stumbling blocks within the crowded crowdfunding space. These shortcomings have spurred the emergence of decentralized applications (DApps) built on the Ethereum blockchain, offering a promising alternative solution. Decentralized applications leveraging the Ethereum blockchain have emerged as a beacon of innovation, revolutionizing the landscape of fundraising by providing a decentralized framework for activities, collaboration, and transaction data. By securely storing information across a distributed network accessible to all users, these DApps eliminate reliance on centralized servers, thereby enhancing performance and drastically reducing the risk of fraud. This decentralized architecture not only addresses the shortcomings of traditional crowdfunding platforms but also fosters a more transparent and equitable ecosystem for fundraising endeavors.

II. LITERATURE SURVEY

[1] Crowdfunding Platform Using Blockchain Technology – June 2022: Dr. R. Senthamil Selvi, Surya Prakash R, Vishnu C, Priyadharsan A S, PrasannaVenkateshwar D B - The paper introduces a blockchain-based crowdfunding platform using Ethereum's smart contracts. It consists of three modules: Campaign Creation, Contribution, & Fund Withdrawal. The platform aims to enhance transparency and security in crowdfunding. The paper lacks discussion on potential challenges, risks, or vulnerabilities associated with blockchain and Ethereum. It lacks real-world implementation data and user feedback. Future scalability and regulatory compliance concerns are not explored.

[2] Applying Ethereum Smart Contracts to Blockchain-Based Crowdfunding System to Increase Trust and Information Symmetry – July 2021 by Nik Azlina Nik Ahmad, Syed Abdul Halim Syed Abdul Rahman – The paper explores how blockchain and smart contracts can improve crowdfunding in fundraising organizations, focusing on registration, campaigns, donations, and disbursements. Blockchain and smart contracts enhance transparency, reduce fraud, and streamline crowdfunding processes, but implementation costs and cryptocurrency legality are concerns. Limitations include the potential cost burden for organizations implementing blockchain & smart contract solutions. Also, some governments may not legally recognize cryptocurrencies commonly used in smart contract transactions. The technical complexity & expertise required for successful implementation are also important concerns.

[3] Smart Contract and Blockchain for Crowdfunding Platform June 2020 by Firmansyah Ashari, Tetuko Catonsukmoro, Wilyu Mahendra Bad, Sfenranto, Gunawan Wang - The paper demonstrates the integration of Ethereum Smart Contracts into crowdfunding to address information asymmetry, enhance transparency, and build trust among contributors. The limitations of the research paper include slower transaction speeds in blockchain, potential user difficulty in understanding blockchain, and the need for future research on smart contract token integration and user experience improvement.

[4] Crowd Funding using Blockchain." Global Research and Development Journal For IEEE (2019): 19 – 24 by Ms. S. Benila, Ajay. V, Hrishikesh. K, Karthick. R. – The paper discusses a modular approach for crowdfunding, the campaign creators will post their project ideas in the campaign and interested people will donate the funds to the project idea. The only limitation is that Blockchain-based crowdfunding application is a tough concept to be understood by everyone since it shows a small prototype only.

[5] A blockchain-based crowdfunding platform for future smart and connected nation, Sustainable Cities and Society, Volume 60, 2020, 102145, IEEE 2210-6707 by Vikas Hassija, Vinay Chamola, Sherali Zeadally, BitFund – This paper proposes a global crowdfunding platform based on bidding. It demonstrated that multiple iterations of bidding reach an optimal solution and it is better than other generic algorithms. Limitations include excessive requirements and understanding of bidding

[6] Crowdfunding Using Blockchain. International Journal of Advanced Science and Technology, IEEE 29(1), 932 – 945 by Trupthi M, S. K. R. K. (2022) - The paper proposes developing a web-based application using Ethereum platform where a smart contract-based solution that allows for safe crowdfunding by assuring that the money provided by investors is secure. The limitation is that since the vendor's address isn't confirmed, the campaign author and the vendor can conspire to defraud the contributions. Also, as of present, a single person can only give once to a campaign/start-up from a single account. The Ethereum accounts into which the contributors are putting their money are likewise unverified.

Survey of Existing Systems

Building trust between the crowd and backers is crucial at the core of the crowdfunding ecosystem. The working group relies on money as the priority for the project and its success; Sponsors, on the other hand, want transparency in the allocation of money and want the money to be taken back if the project fails. As intermediaries, centralized crowdfunding platforms pay large fees to groups and backers to mitigate risks such as unfinished projects or lack of support. However, the expectation of trust in the platform and the high price decision may deter sponsors and teams from participating. Researching charities has led to many ideas for improving their credibility. Academics support greater monitoring of organizations in the legal, administrative, economic, and social fields. It was also stated that there are efforts to increase financial transparency in Chinese charities. Recommendations include strengthening accountability mechanisms and government oversight and limiting aid agencies' discretion. Researchers also proposed new solutions that use blockchain technology to increase transparency in donations. These leverage blockchain platforms like Bubi and Ethereum to create Bitcoin-based charity platforms designed to help secure donations, especially in areas without internet connectivity. Collectively, these studies have laid the foundation for a new volunteering model that leverages the potential of blockchain technology

Limitations in Existing System

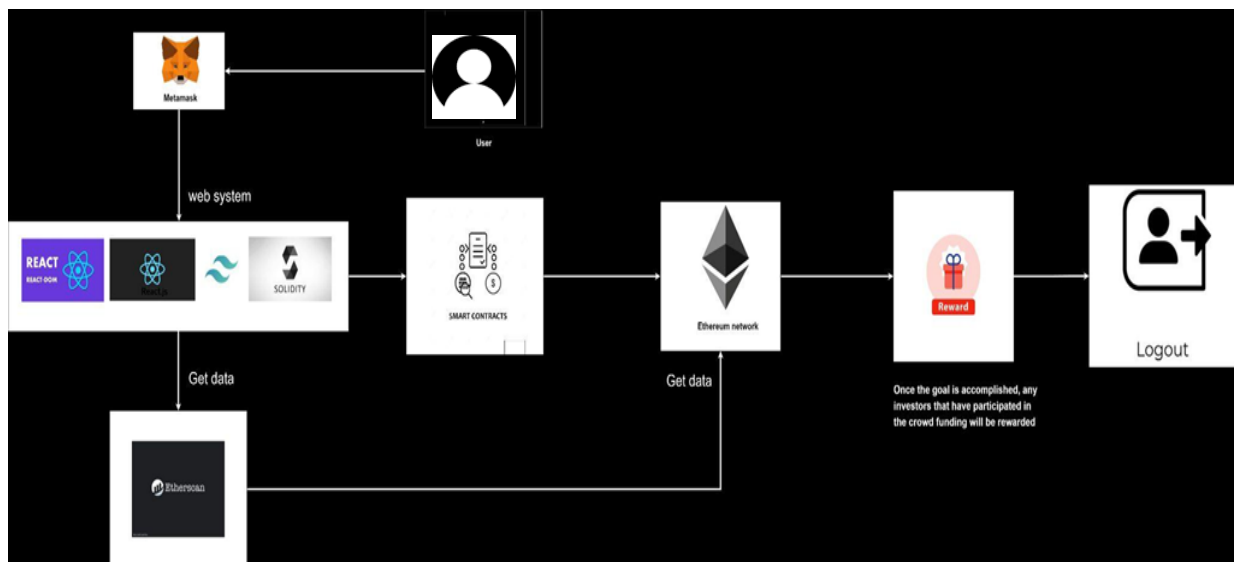
High Costs: While multiple platforms provide a great way for new businesses to raise capital, the costs involved can be a big problem. The fact that the fees paid by these platforms are fixed or equal to the total income creates financial problems for start-ups with limited capital. Therefore, entrepreneurs should carefully evaluate the cost of different crowdfunding methods to make informed decisions about raising funds.

Fraud: Despite their potential benefits, financial institutions are vulnerable to fraud, including scams. Fraud cases mislead investors, cause financial losses and damage the reputation of financial platforms. This highlights the importance of strong measures to reduce the risks associated with fraud and protect the interests of investors and legitimate project developers.

Lack of transparency: Transparency is an important part of money exchange, but some platforms may not be transparent in the flow and distribution of money. This lack of transparency can undermine business trust and raise concerns about employee accountability. Crowdfunding platforms should prioritize transparency, providing clear and transparent information about the use of funds and the success of the project.

Centralized management: Centralized management and authority to manage information on a platform that may lead to risk. This centralization exposes information to possible leaks, information mismanagement, and losses due to cyber-attacks or system failure. This central control ensures the security of investors and project information, and measures must be taken for the fate of the central management to protect the information and reduce risks.

III. PROPOSED SYSTEM



—Fig 1: Proposed System

User Interface (UI): Enhances the frontend interface to display information about available rewards for each crowdfunding campaign. Allows backers to view reward tiers, select desired rewards, and track their reward status. Provides a user-friendly interface for project creators to define reward tiers, manage rewards inventory, and communicate with backers regarding rewards fulfillment.

Backend Services: Extends backend services to support reward management functionalities. reward inventory, including tracking the availability of each reward tier and updating inventory levels as rewards are claimed. Implements business logic for calculating reward eligibility based on contribution amounts and reward tier selections. Facilitates communication between project creators and backers regarding reward fulfillment, shipping details, and delivery status.

Blockchain Layer: Augments smart contracts to handle reward distribution and redemption. Defines reward tiers and associated criteria within crowdfunding smart contracts. Automates the allocation of rewards to backers based on contribution amounts and selected reward tiers. Tracks the issuance and redemption of rewards on the blockchain ledger to ensure transparency and auditability.

Smart Contracts: Enhances crowdfunding smart contracts to include reward-related functionalities. Implements logic for verifying reward eligibility, allocating rewards to backers, and updating reward inventory. Defines events and functions for backers to claim rewards, project creators to fulfill rewards, and administrators to monitor reward status.

Payment Gateway Integration: Integrates payment processing functionalities with reward fulfillment processes. Facilitates payment transactions related to reward purchases, shipping fees, and other associated costs. Ensures secure and efficient payment processing for reward-related transactions, including fiat and cryptocurrency payments.

Identity Verification and Compliance: Extends identity verification mechanisms to validate reward recipient's identities for shipping and delivery purposes. Collects shipping information from backers and verifies addresses to ensure accurate reward delivery. Implements compliance measures to adhere to shipping regulations, customs requirements, and tax obligations associated with reward fulfillment.

Monitoring and Analytics: Enhances monitoring and analytics capabilities to track reward-related metrics and performance. Provides insights into reward redemption rates, inventory levels, shipping timelines, and customer satisfaction. Enables project creators to analyze the effectiveness of reward offerings and optimize reward strategies to incentivize backers.

Admin Panel: Introduces reward management features within the admin panel for administrators to oversee reward-related operations.

Reward: Allows administrators to monitor reward inventory, resolve reward-related disputes, and intervene in reward fulfillment processes if necessary

IV. METHODOLOGY:

User Registration and Project Creation: To begin using the platform, users register by providing personal details and creating an account, gaining access to its crowdfunding features. Project creators then submit detailed proposals outlining their project's purpose, funding goals, timeline, and media content to engage potential investors.

Smart Contract Creation: Creating a smart contract is crucial, as it sets the campaign's terms and conditions transparently, automating key functions like fund management and minimizing errors. This enhances trust and accountability among participants, leveraging blockchain technology.

Fundraising Phase: Contributors can securely send cryptocurrencies to the designated smart contract address, recording each contribution transparently on the blockchain. This allows a global community to participate, transcending geographical barriers and traditional financial limitations.

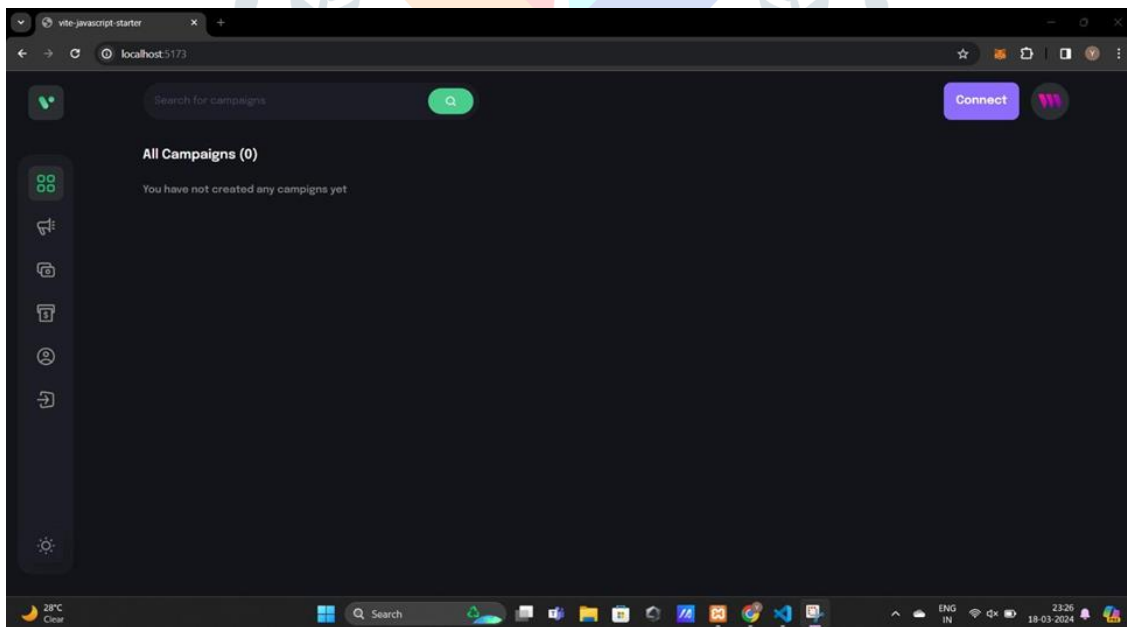
Reaching Funding Goal: When the project achieves its funding goal before the deadline, the smart contract automatically releases the funds to the project team, eliminating delays and ensuring efficient resource allocation.

Refunding Phases: Significant investors can approve or reject withdrawal requests, promoting community consensus in fund utilization. Approved withdrawals are transferred securely, with all actions immutably recorded on the blockchain to guarantee transparency and prevent tampering.

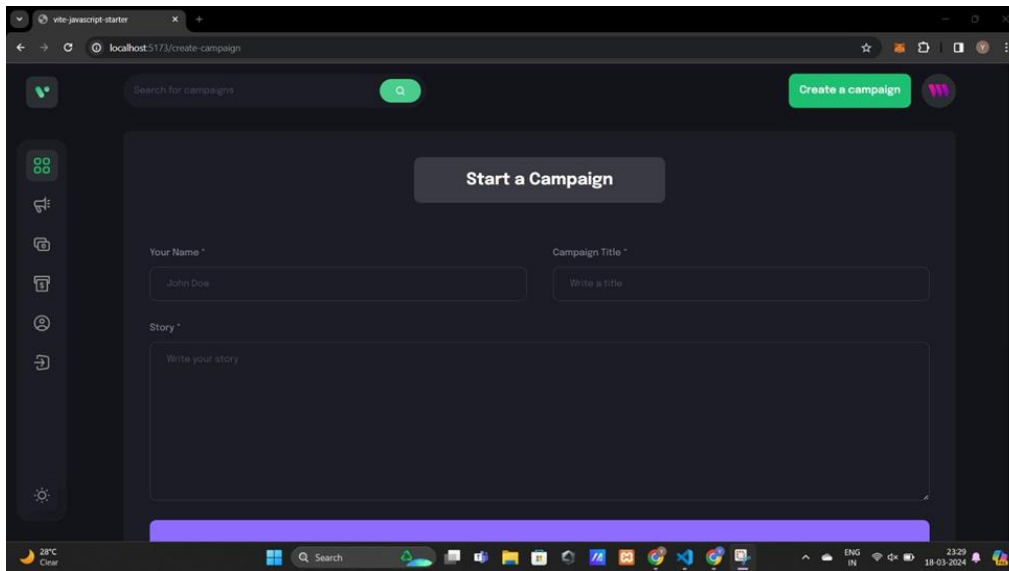
Transparency and Tracking: Real-time monitoring of fund flow enhances transparency, while incentives and rewards incentivize frequent investors, fostering a vibrant crowdfunding ecosystem without plagiarism.

Incentives and rewards: Some incentives/gift cards (Amazon gift cards, steam gift cards, etc.) will be given to investors who trade regularly in the project.

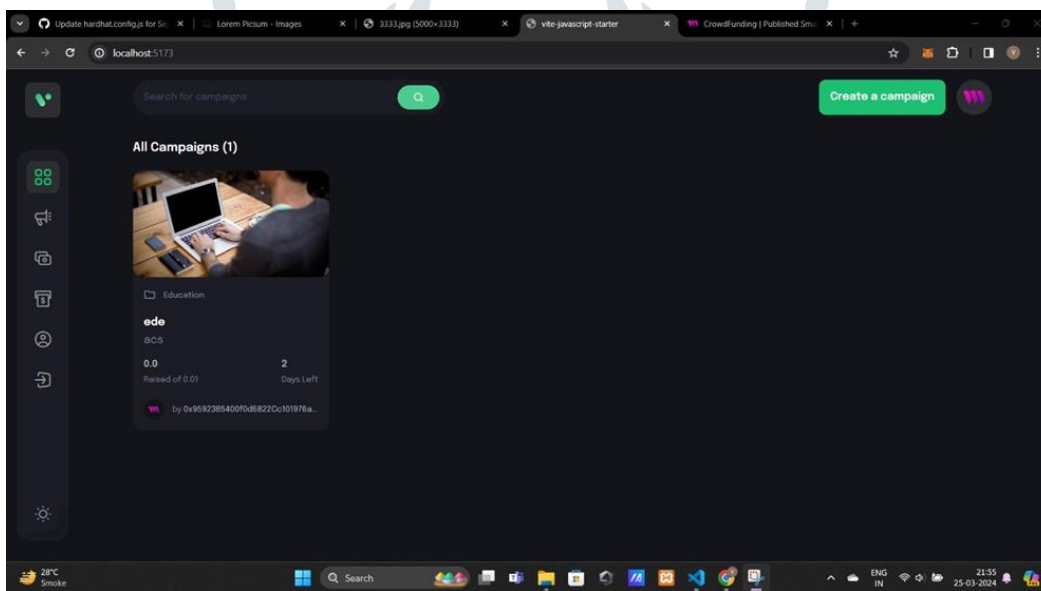
V. RESULTS



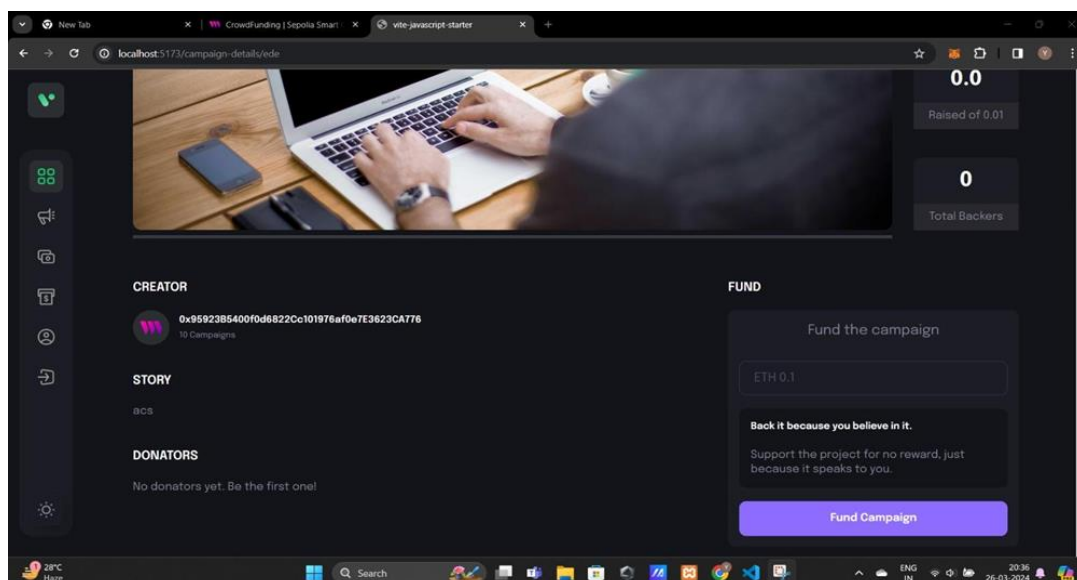
—Fig 2: Homepage



—Fig 3: Campaign Creation



—Fig 4: Campaign List



—Fig 5: Contributors & Approvers

VI. CONCLUSION

In this paper we conclude that the proposed web-based crowdfunding system developed using blockchain technology addresses the critical issues faced by traditional crowdfunding platforms by leveraging Ethereum smart contracts and the solidity programming language this system offers enhanced trust transparency control over funds and secure storage of transactions the use of Infura provides a reliable connection between the web system and the Ethereum network ensuring that all transactions are recorded safely and credibly this innovative approach to crowdfunding eliminates the need for charging fees and offers a more secure and trustworthy way for startups to raise funds overall this system offers a promising solution to the challenges faced by traditional crowdfunding platforms and it has the potential to revolutionize the way startups are funded.

VII. REFERENCES

1. Blockchain-Based Crowdfunding Application IEEE, <https://ieeexplore.ieee.org/document/9640888>, 2021 Fifth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), 11-13 November 2021, 10.1109/I-SMAC52330.2021.9640888 at Palladam, India.
2. Blockchain-Based Crowdfunding: A Trust Building Model IEEE, <https://ieeexplore.ieee.org/document/9671003>, 2021 International Conference on Artificial Intelligence and Machine Vision (AIMV), 24-26 September 2021, 10.1109/RTEICT52294.2021.9573956 at Gandhinagar, India.
3. Blockchain Integrated Crowdfunding Platform for Enhanced Secure Transactions IEEE, <https://ieeexplore.ieee.org/document/9633380>, 2021 4th International Conference on Recent Developments in Control, Automation & Power Engineering (RDCAPE), 07-08 Oct 2021, 10.1109/RDCAPE52977.2021.9633380 at Noida, India.
4. I. Khoury, R. M. El-Mawas, O. El-Rawas, E. F. Mounayar, and H. Artail, "An efficient web page change detection system based on an optimized hungarian algorithm," IEEE Transactions on Knowledge and Data Engineering, vol. 19, no. 5, pp. 599–613, 2007.
5. O. Abedinia, D. Raisz, and N. Amjady, "Effective prediction model for hungarian small-scale solar power output," IET Renewable Power Generation, vol. 11, no. 13, pp. 1648–1658, 2017.
6. F. Zhang, X. Zhou, and M. Sun, "Constrained vega auction with multi-level channel valuations for spatial spectrum reuse in non-symmetric networks," IEEE Transactions on Communications, vol. 67, no. 2, pp. 1182–1196, 2019.
7. Z. Mao, Y. Shang, and J. Chen, "Multidimensional bid greedy auction mechanism for bandwidth allocation," IEEE Communications Letters, vol. 19, no. 6, pp. 973–976, 2015.
8. I. Mezei, V. Malbasa, and I. Stojmenovic, "Greedy extension of localized auction based protocols for wireless robot-robot coordination," in 2009 7th International Symposium on Intelligent Systems and Informatics. IEEE, 2009, pp. 53–57.