International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

EtherFund: A Blockchain-Based Decentralized Crowdfunding Platform

Mr. Anuj J. Ghom[1], Mr. Atharv N. Phuse[2], Mr. Harish S. Chopade[3], Mr. Mahesh A. Ghongade[4], Prof. Sumit S. Sagane[5]

[1,2,3,4,5]Computer Science and Engineering, P. R. Pote Patil College of Engineering, Management Amravati, India

Abstract

The increasing demand for transparency, security, and efficiency in crowdfunding platforms has driven the adoption of decentralized systems powered by blockchain. EtherFund is proposed as a blockchain-based decentralized crowdfunding platform utilizing Ethereum's smart contract capabilities. This paper explores the design, architecture, and benefits of EtherFund, focusing on how it addresses issues inherent in traditional platforms such as centralized control, high fees, and lack of transparency. The research also provides a detailed analysis of EtherFund's potential to enhance trust, security, and efficiency within the crowdfunding ecosystem. Findings indicate EtherFund's significant potential to revolutionize the crowdfunding industry by decentralizing control and ensuring secure.

Keywords: Blockchain, Crowdfunding, EtherFund, Smart Contracts, Decentralization

I. INTRODUCTION

Crowdfunding platforms have revolutionized the way individuals and organizations raise funds, providing access to capital for innovative projects, startups, and social causes. Traditional platforms such as Kickstarter and GoFundMe operate with centralized control, often imposing high fees and limited transparency in fund management. Blockchain technology offers a promising solution, providing a decentralized, transparent, and secure alternative to traditional crowdfunding models (Nakamoto, 2008).

The concept of decentralization in crowdfunding removes the reliance on a central authority or intermediary, and blockchain-based platforms offer more security by ensuring that every transaction is verifiable and immutable on the blockchain ledger. For creators, blockchain reduces the administrative overhead associated with handling backers' contributions, while providing contributors with assurances that funds will only be used for designated purposes.

This research contributes to the growing body of knowledge on decentralized finance (DeFi) and blockchain applications, specifically in the realm of crowdfunding. By investigating EtherFund, this study provides insights into the future of crowdfunding, the potential for decentralized platforms, and the associated challenges.

This paper presents the architectural framework of EtherFund, outlining its use of Ethereum smart contracts to decentralize control, ensuring that all financial transactions and fund allocations are transparent and secure. Additionally, EtherFund has the potential to eliminate geographical barriers in crowdfunding by allowing anyone globally to participate, regardless of regional banking restrictions.

II. OBJECTIVES

The objective of this research is to design and develop EtherFund, a decentralized crowdfunding platform on the Ethereum blockchain. The project aims to provide a secure, transparent, and efficient environment for fundraising through the use of smart contracts. These contracts will automate the collection, management, and distribution of funds, ensuring that contributions are only released when predefined conditions are met.

1. To ensure security and transparency by recording all transactions on the blockchain, allowing contributors full visibility into fund usage.
2. To implement decentralized governance through a withdrawal request mechanism that enables contributors to participate in decision-making for project fund allocation.
3. To create a scalable and user-friendly platform capable of handling large volumes of transactions while providing an intuitive interface for users.

III. LITERATURE SURVEY

1. The Karma-Token project is a blockchain-based platform designed for charitable foundations, aimed at building a trusted network for collecting donations. The network would include highly reputable organizations, ensuring a strong foundation. By using the platform's features like transparency, traceability, and the ability to keep records secure, all of an organization’s activities would be fully visible to everyone. This openness helps to expose and minimize the impact of any dishonest activities, making it harder for fraudulent institutions to operate.
2. Blockchain technology has the potential to make donation and financial transaction processes accessible to everybody. I'll analyse the justification provided for the creation of a blockchain-based platform for tracking charitable contributions in this article. The blockchain's unchangeable record makes it easy to track the impact of charitable donations. This ensures that everyone can clearly see how the money is being used and who is managing it, making donations through the platform completely transparent.
3. The blockchain mechanism is presented in detail and then compared to the three main platforms where blockchain has been examined in depth: bitcoin, Literature survey 2 Ethereum, and Hyperledger. In this study, we propose employing proof of authority in the Ethereum blockchain as a consensus procedure. A detailed look at how blockchain has made a difference in the philanthropic and non-profit sectors is provided. Researchers have also introduced an efficient economic model that works well within this framework.
4. In order to gauge users' viewpoints and receptivity to implementing blockchain technology on the crowdfunding site, Yaqi Zhou developed a scenario-based questionnaire by fusing design theory and innovation dissemination theory Compared to traditional options, certain combinations of blockchain design features have been shown to greatly influence people's willingness to adopt the technology. As a result, the use of peer-to-peer (P2P) systems has surged, particularly on blockchain-based fundraising platforms that are built on P2P networks and distributed ledger technology (DLT).
5. [5] The potential of blockchain technology to address issues with conventional crowdfunding platforms is examined in this article. In order to automate and safeguard transactions, the authors suggest a decentralized crowdfunding platform that makes use of smart contracts on the Ethereum blockchain.

IV. METHODOLOGY

The system is developed using Next.js for the front-end and Node.js for the back-end, with smart contracts written in Solidity. The development environment is powered by Hardhat, which simulates a local Ethereum blockchain for efficient contract testing and deployment. Ethers.js is used to interact with the blockchain, while MetaMask serves as the user's wallet for managing accounts and signing transactions.

Hardhat is configured to run a local Ethereum node, providing a simulated blockchain for testing. This makes it possible to quickly test the system in real-time, without needing to connect to outside networks. Smart contracts are written in Solidity, compiled, and deployed locally using Hardhat's development environment. Ethers.js is used for interacting with the deployed contracts, handling deployment scripts, and managing interactions with the blockchain.For user interactions, MetaMask is used as the wallet, allowing users to manage their accounts and connect to the local Hardhat network. After configuring MetaMask to connect with the local network, users can create Ethereum accounts, sign transactions, and send or receive Ether for the crowdfunding platform.

On the front end, the system is built with Next.js to provide a modern and responsive user interface. The Ethers.js library is integrated to facilitate interaction between the front-end and the Ethereum blockchain. Users can create campaigns, contribute Ether, and interact with the smart contracts deployed on the local blockchain through the Next.js interface.

The system enables campaign managers to create and manage crowdfunding campaigns. Contributors can interact with these campaigns by donating Ether, and they can vote on how the funds should be used. If a majority of contributors approve a fund request, the Ether is transferred to the vendors. All transactions are processed and tested locally using Hardhat.

Testing is done using Hardhat's built-in tools, which provide a robust framework for running automated tests on the smart contracts. This helps ensure that the contracts work as intended and handle various edge cases. Transaction logs are monitored via Hardhat's console to track and debug user interactions.

This system setup provides a full local blockchain simulation, allowing for efficient testing and development of the crowdfunding platform using Hardhat, MetaMask, Next.js, and Ethers.js.

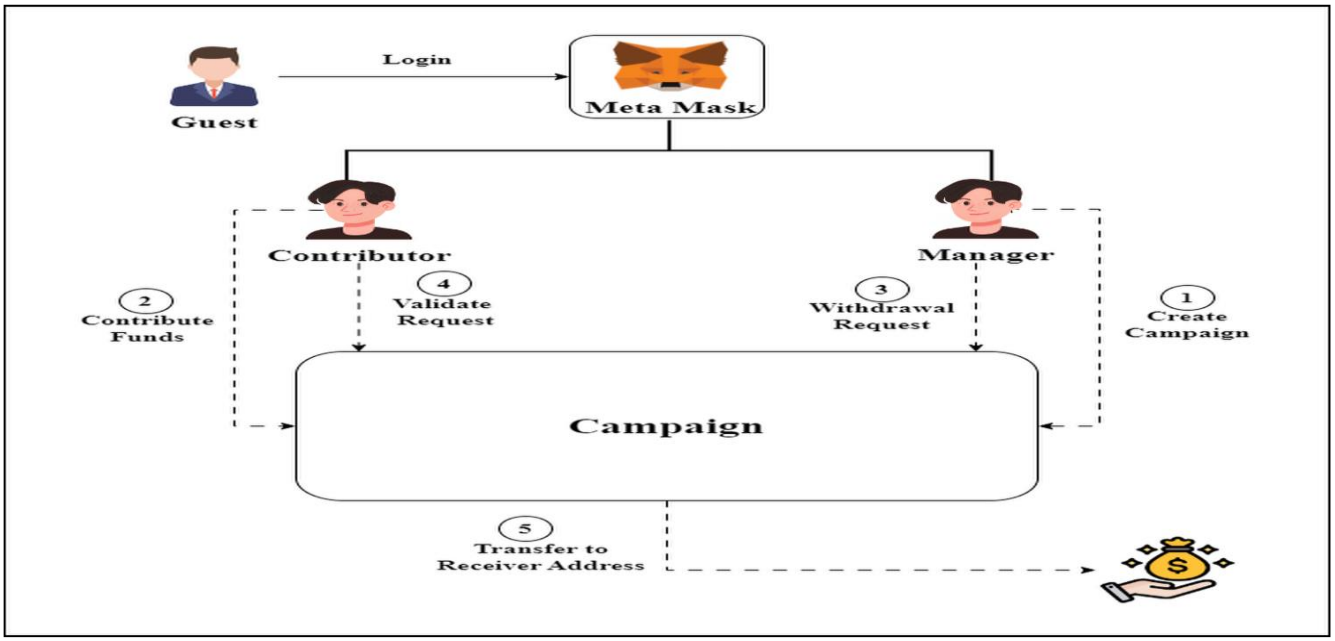

Fig. System flow

V. CONCLUSION

In conclusion, our initiative aims to revolutionize the current crowdfunding landscape by harnessing the power of blockchain technology. By overcoming the challenges of traditional systems, we aim to build trust and transparency, inspiring people to get involved in supporting new ideas and contributing to charitable causes. This transformative approach not only enhances the credibility of crowdfunding platforms but also has the potential to strengthen the overall economy by empowering creators and contributors alike. Ultimately, our goal is to bring people together from all over the world, united by a common mission to create positive change in their communities and beyond. Together, we can build a future where every contribution makes a difference and every idea has the chance to thrive

VI. REFERENCES

1. Gubaev Renat, Anton Peresichansky, Alexandr Belenov, Artem Barger, “Karma – blockchain-based charity foundation platform,” IEEE International Conference on Blockchain and Cryptocurrency (ICBC), 2021.
2. Hadi Saleh, Sergey Avdoshin, Azamat Dzhonov, “Platform for Tracking Donations of Charitable Foundations Based on Blockchain Technology”, Actual Problems of Systems and Software Engineering (APSSE), 2020
3. Xin Fan, “Charity Supervision Management System Based on Blockchain”, 2nd International Conference on Computer Science and Management Technology (ICCSMT), 2022.
4. Yaqi Zhou, “Understanding Users' Reaction to Blockchain Technology on the Online Fundraising Platform:—Evidence from Scenario Simulation Experiments”,International Conference on Computer Information Science and Artificial Intelligence (CISAI), 2022.
5. Blockchain-based Crowdfunding: Decentralized Solutions to Issues Facing Crowdfunding Platforms" by Anirudh Venkatesh and Vasilis Kostakis
6. Saadat, Md & Halim, Syed & Osman, Husna & Nassr, Rasheed & Zuhairi, Megat. (2019). Blockchain-based crowdfunding systems.
7. Indonesian Journal of Electrical Engineering and Computer Science. 15. 409. 10.11591/ijeecs.v15.i1.pp409-413.x
8. Dr. K. M. Anandkumar, Shravan Vignesh, M Sivakumar and Syed Adnaan, “An approach for crowdfunding using blockchain”, 2024, E3S Web of Conferences 491, https://doi.org/10.1051/e3sconf/202449102021
9. Asim Shrestha, Ling Li, Anjee Gorkhali, Blockchain: a literature review, 2020, Journal of Management Analytics, https://doi.org/10.1080/23270012.2020.1801529.
10. Zibin Zheng and Shaoan Xie, “Blockchain challenges and opportunities: A survey”, 2018, International Journal of Web and Grid Services 14(4):352 DOI:10.1504/IJWGS.2018.095647.
11. Priyanka Gupta, Vedika Sangle, Rutuja Patil, Anjali Jadhav, Mayuri Aher, Shruti Khivansara, “A Comparative Dive into Crowdfunding Methods - Traditional vs Blockchain”, 2024.
12. Prof D. L. Falak, Soudagar Shanawaz, Jadhav Pranav, Katke Kajal, Shukla Utkarsh, “Crowd-Funding Using Blockchain Technology”, 2022, International Journal of Research Publication and Reviews.
13. Firmansyah Ashari, Tetuko Catonsukmoro, Wilyu Mahendra Bad, Sfenranto, Gunawan Wang, “Smart Contract and Blockchain for Crowdfunding Platform”, 2020, International Journal of Advanced Trends in Computer Science and Engineering, https://doi.org/10.30534/ijatcse/2020/83932020..

14. "Crowd-Funding Using Blockchain technology", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.10, Issue 6, page no.g518-g525, June-2023, http://www.jetir.org/papers/JETIR2306662.pdf
15. Mr. Mangesh K. Nichat, Prof. Nitin R.Chopde, Landmark Based Shortest Path Detection by Using A* and Haversine Formula, International Journal of Innovative Research in Computer and Communication Engineering, Volume 1, Issue 2, Pages 298-302.
16. Mr. Mangesh K Nichat Dr. P. V. Ingole, Landmark based shortest path detection by using Dijkestra Algorithm and Haversine Formula, International Journal of Engineering Research and Applications ,Publication date 2013,Journal Volume 3 ,Issue 3 ,Pages 162-165.
17. Mangesh K Nichat Milind K Tatte, Enhancement in Agro Expert System for Rice Crop, International Journal of Electronics Communication and Computer Engineering, Volume 4, 2013.
18. Mr. Mangesh K Nichat Dr. P. V. Ingole, Review on Modeling and Implementation of Cloud Computing, International Journal of Computer Science and Information Technologies, Volume 5, Issue 1, Pages 508-511.
19. Prof. Mangesh Nichat, Prof. Satish Alaspurkar, Prof. Swapnil Chandane, Prof. Surajkumar Manowar, Diagnosis of Disease on Paddy Field with the help of Web based Expert System, International Journal of Managment, IT and Engineering Publication date 2013, Volume 3, Issue Issue 1, Pages 211-217
20. SHRIKANT THAKRE, Prof. M.K.NICHAT, SIDDHARTH WAIKAR, SHIVAM PICHKE, GANESH KHEDKER, SHREYASH BHATKAR, Video Moderation For Inapproprate Content Detection using Machine Learning, International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) Volume 13, Issue 4,2024/4.
21. SHRIKANT THAKRE, PROF. Mangesh. K. NICHAT, SIDDHARTH WAIKAR, SHIVAM PICHKE, GANESH KHEDKER, SHREYASH BHATKAR, Survey on Video Moderation For Inapproprate Content Detection using Machine Learning, International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET),Volume 13,Issue 4, 2024
22. SURBHI KADALE, PROF. MANGESH. K. NICHAT,TANVI SAYARE, PRATIKSHA GITE, RAHI ADOKAR, Detection of Disease affecting on a Specific Plant Organs of Ocra and remedies for sustainable crop management, International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET), Volume 13,Issue 2,2024
23. Mangesh K Nichat, Sanjay E Yedey, Deep Learning Techniques for Identification of Different Malvaceae Plant Leaf Diseases, EAI Endorsed Transactions on Internet of Things, Volume 10, 2024/3/13.
24. Mangesh Nichat, Mohammed Rehan Javed, Covid19 Detection Techniques using X-ray Chest Images, International Journal for Research in Applied Science & Engineering Technology (IJRASET),Volume 10, Issue 5213-5216,2022.
25. Prof. P.G.Nemade , 2 . yashree dhole ,3 Jay Chandak “AUTOMATING LEFTOVER FOOD MANAGEMENT USING A REAL-TIME WEB APPLICATION” ,2024 International Journal for Research in Applied Science & Engineering Technology (IJRASET)Volume:06/Issue:06/April-2024
26. Prof . P.G.Nemade , 2.Anishka P.Gaikwad , 3.Sanket P.Kakad,4.SurajV.Amrute “AUTOMATING LEFTOVER FOOD MANAGEMENT USING A REAL-TIME WEB APPLICATION” ,2024 International Journal for Research in Applied Science & Engineering Technology (IJRASET)Volume:06/Issue:06/April-2024.