

CROWDFUNDING PLATFORM USING BLOCKCHAIN

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ABSTRACT

Blockchain-based crowdfunding is an innovative approach to crowdfunding. Traditional platforms are vulnerable to data breaches, high fees and fraud due to the anonymity of the user's identity. While these risks can be mitigated by the immutability and distribution of the blockchain, there is no central control to make it transparent. To solve these problems, digital identity management with a blockchain foundation has been proposed.

This article focuses on donation-based transactions using Ethereum. Many tasks can be performed simultaneously through this system, which uses the Solidity language to create smart contracts. In this research, we explore user financial platforms. This article provides a comprehensive review of the literature, identifies the strengths and limitations of blockchain-based crowdfunding platforms, examines users' understanding of blockchain, and evaluates the impact of blockchain on crowdfunding. This project proposes a blockchain-based crowdfunding network that can provide privacy, security and decentralization through the use of Ethereum smart contracts.

Keywords: Crowdfunding , Smart Contract , Blockchain ,Ethereum ,Cryptocurrency.

I. INTRODUCTION

Crowdfunding has become one of the most popular methods of raising funds for any project, cause, or individual in need. With the launch of Covid, Crowdfunding activities have been increased all around the world, ranging from tiny campaigns to help individuals acquire oxygen and medical assistance to huge funds like PM Cares. Contributors, crowdfunding platforms, and project administrators were the primary players in the crowdfunding event. Kickstarter.com, Indiegogo.com, and Mystartr.com are some of the most popular crowdfunding platforms. The biggest advantage of crowdfunding is that it can quickly raise the funds required.

Blockchain is a decentralized, immutable database that makes it easier to track assets and record transactions in a corporate network. A tangible asset (a house, car, cash, or land) is different from an intangible asset (intellectual property, patents, copyrights, branding) .On a blockchain network, virtually anything of value may be recorded and traded, lowering risk and lowering costs for all parties involved. Information is the lifeblood of any business. The faster and more precise it is, the better. Because blockchain delivers immediate, shareable, and entirely transparent information recorded on an immutable ledger that can only be viewed by permissioned network users, it is excellent for conveying that information. Orders, payments, accounts, production, and much more can all be tracked on a blockchain network. Because members share a single version of the truth, you can see all the intricacies of a transaction from beginning to end, providing you more confidence and opening up new efficiencies and opportunities.

Smart contracts are an integral part of the Ethereum blockchain and are key to its development. They function like real-world contracts but are entirely digital, being computer programs stored on the blockchain. These programs automatically execute when predefined conditions are met, allowing anonymous parties to transact securely and trustingly without the need for a central authority. Solidity and Vyper are programming languages used to create Ethereum smart contracts. MetaMask is a cryptocurrency wallet that provides access to the Ethereum network through browser extensions or a mobile app. Created by ConsenSys Software Inc., MetaMask allows users to securely interact with decentralized applications, manage account keys, broadcast transactions, send and receive Ethereum-based coins and tokens, and store account keys through a suitable web browser or the mobile app's built-in browser.

II. LITERATURE SURVEY

[1] is a Decentralized Autonomous Organization (DAO) based on Ethereum. In this system, the registered users can share songs, drawings, videos, or just advertisements. The other users can like the post, comment, or tip the owner of the post which will cost a certain amount of Likoin; a custom Ethereum ERC-20 token through Initial Coin Offerings (ICOs). Each of the above activities gives a certain amount of Likoin to the owner of the post. The Likoin tokens can be shared among users.

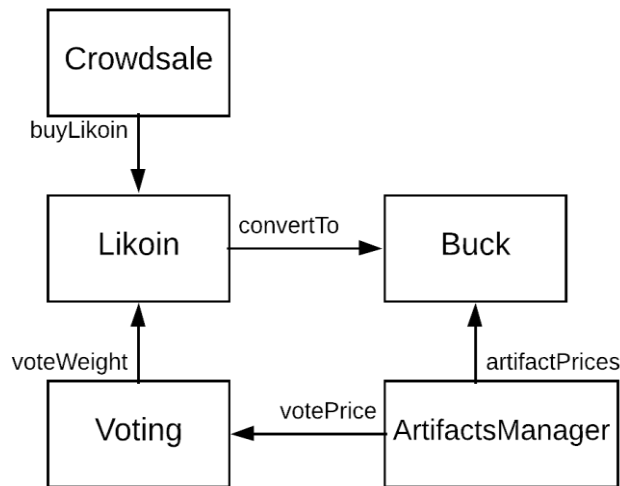


Figure 1: Like Starter smart contracts architecture.

The [2] is a modular approach to crowdfunding that allows campaign creators to post their project ideas or fundraising programs for medical, educational, or other purposes. The platform utilizes the Ethereum network, Solidity programming language, and a consensus protocol to ensure safe, secure, and transparent transactions. It targets both individuals and organizations, but has the limitation of being difficult for some people to understand due to its reliance on blockchain technology and the use of the Rinkeby test network, which was deprecated on October 5, 2022. Despite these limitations, the platform offers a unique and innovative way for people and organizations to raise funds and bring their ideas to life.

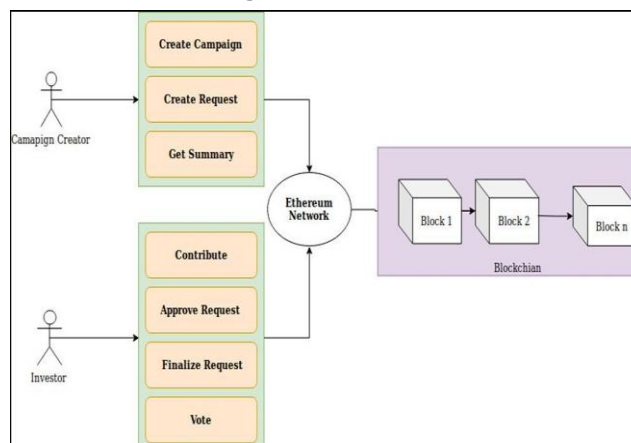


Figure 2 : Working Model.

The [3] is a crowdfunding platform that leverages the power of blockchain technology and an auction mechanism to bring together the most suitable developers and investors. The platform utilizes the Ethereum network and Solidity programming language to create smart contracts, and it employs the Proof of Work consensus algorithm to ensure the security and integrity of transactions. The platform is designed to cater to both individual users and organizations, but it does have the limitation of relying on the Rinkeby test network, which was discontinued on October 5, 2022. Despite this limitation, the platform offers a unique and innovative way for developers and investors to connect and collaborate on projects, and it has the potential to revolutionize the crowdfunding industry.

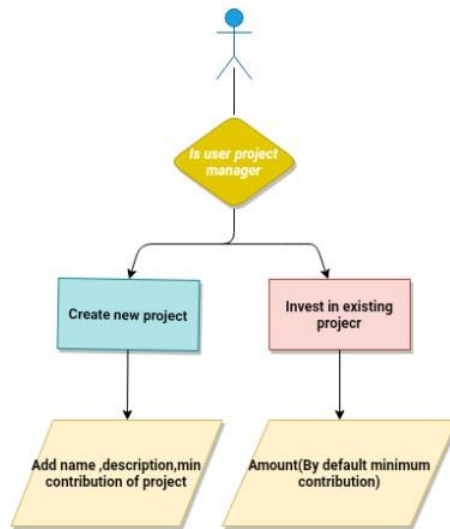


Figure 3: Creating or contributing to project

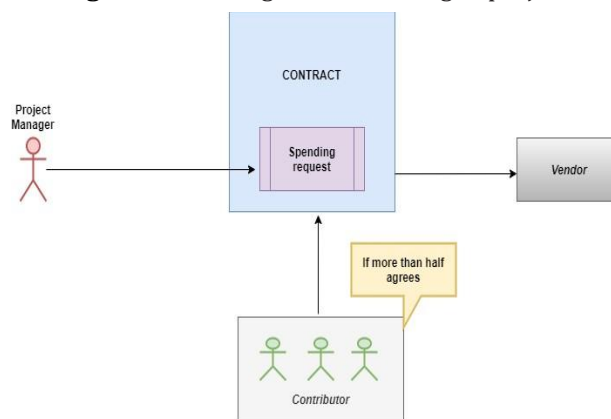


Figure 4: Voting system ensures money spent is in control of contributors

The [4] is a donation-based crowdfunding platform that allows individuals and organizations to raise money for business projects, charities, and other causes. The platform utilizes Solidity programming language to create smart contracts and can be accessed through social media or other online platforms to reach a wide audience of potential sponsors. However, the platform does have the limitation of offering premium accounts with additional privileges. Despite this limitation, the platform provides a convenient and effective way for people and organizations to raise funds and bring their ideas to life.

[5] is a crowdfunding platform called WHIRL that is based on a pay-it-forward economic model. This model aims to create a positive feedback loop of generosity and giving, in which anyone who starts a campaign has already paid their dues by supporting other projects on the platform. WHIRL stands out from other crowdfunding platforms due to this principle, as every other platform requires fundraising to fulfill its obligations to backers. The platform utilizes the Whirl method, which has demonstrated the ability to reach an optimal solution through multiple iterations of bidding and performs better than other generic algorithms. However, the platform does have some limitations, including the requirement for users to collect Karma points before launching a campaign, the use of the lesser-known Whirl method, and a lack of sufficient documentation. Despite these limitations, WHIRL offers a unique and innovative way for individuals and organizations to raise funds and bring their ideas to life.

BitFund [6] is an online cryptocurrency investment platform. Marketers and developers can follow the trend of the network. Traders can request a specific project and offer starting prices based on the time, cost and maintenance required. Different developers may compete with different values at different rates to take ownership of the project. Smart contracts are used by investors and developers to reach the best solution for investors. There is a lot of competition between manufacturers until there is an agreement or balance.

However, the absence of a third-party force proves fair to developers and investors alike, as smart contracts or custom action phone numbers have no effect on bias. Investors can present their needs and developers can compete on projects until they find the best deals that meet investors' Copy and developer needs. Among them, the Ethereum framework is used to send smart contracts between developers and investors for smart computing and conflict prevention.

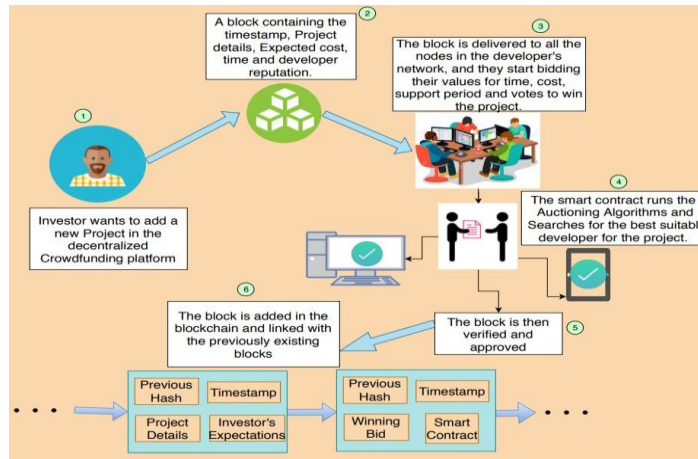


Figure 5: High-level steps involved in the proposed crowdfunding model.

[7] is a crowdfunding application that, unlike other application, only allows people to deposit their money, but this platform also recognizes backers whose returns will be guaranteed. The app will also provide transparency between backers and startups, so backers can track the progress of the various initiatives they've invested in. If the project does not continue midway, the money is returned to the sponsors. This will be a multi-user application with three different user types: Admin, Supporter, and Startup. Administrators can agree to start a public service. Startups can view the status of their operations and their revenue over time. Supporters can see the progress of the projects they have funded and general information about other projects listed in the application.

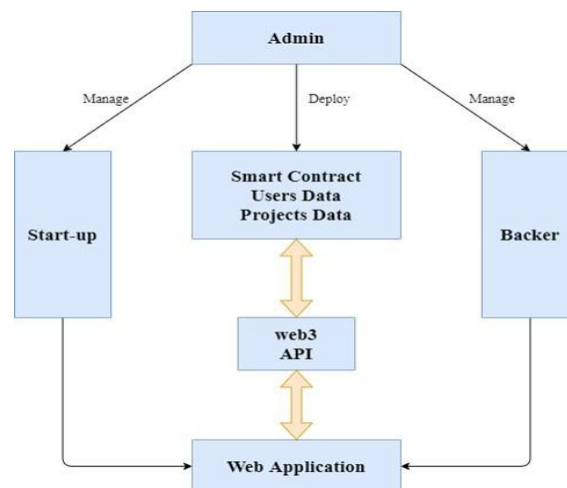


Figure 5: Architecture Diagram.

Traditional crowdfunding platforms [8] are vulnerable to data breaches, high transaction and platform fees, and rampant fraud that occurs due to the anonymity of user identity, i.e. users cannot be identified when they commit cybercrime. These are attempts to solve these existing problems using a digital identity management system with a Blockchain underlying system. A digital identity management system is an alternative to the Know Your Customer (KYC) system that organizations use to verify the identity of customers. . The cost of running an organization using a digital identity management system is much lower than the cost of KYC systems. By implementing blockchain into a digital identity management system, malicious users can be identified and action taken against them. The use of blockchain in a digital identity management system secures the system against centralized architecture attacks such as DDoS and data breaches.

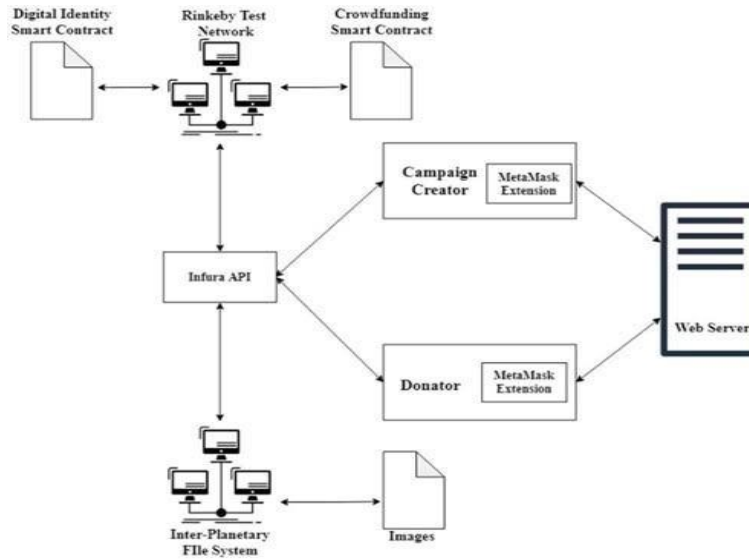


Figure 6: System Architecture.

III. PROPOSED METHOD

This system is aimed to overcome the above major shortcomings with current crowd funding platforms. Crowd fundraising involves a large number of transactions, it is necessary to manage and document them legally. As a result, a smart contract is utilized, which is a transaction protocol that automatically executes, controls, and documents transactions on behalf of project creators and investors in accordance with the agreement. Any web-based application is a centralized application which means that everything done on the platform is controlled by a single company server. Decentralized application is offered based on the Ethereum Blockchain, in which all campaign information, contributions, withdrawal requests, and funds are stored on a blockchain network that is open to all. The concept is called "Distributed ledger technology." The distributed ledger and its contents are available to all network participants. Here, the transaction uses PoS in which it is more fast and secure than existing PoW. It is energy efficient in which the nodes are not competing against each other to attach a new block to the blockchain, energy is saved. Proof of stake cuts out the need for complex computations. So, it beats proof of work when it comes to energy efficiency. A transactional record that cannot be changed. Transactions are recorded only once with this shared ledger, reducing the duplication of effort. After a transaction is recorded to the shared ledger, no participant can edit or tamper with it. If a mistake is found in a transaction record, a new transaction must be entered to correct the problem, and both transactions are then visible. This means that all nodes on the blockchain may see and store funds and transactions preventing data from being held on a single or centralized server. As a result, safeguarding the funds from falling into the wrong hands and being misused is an elegant and practical solution to the situation at hand.

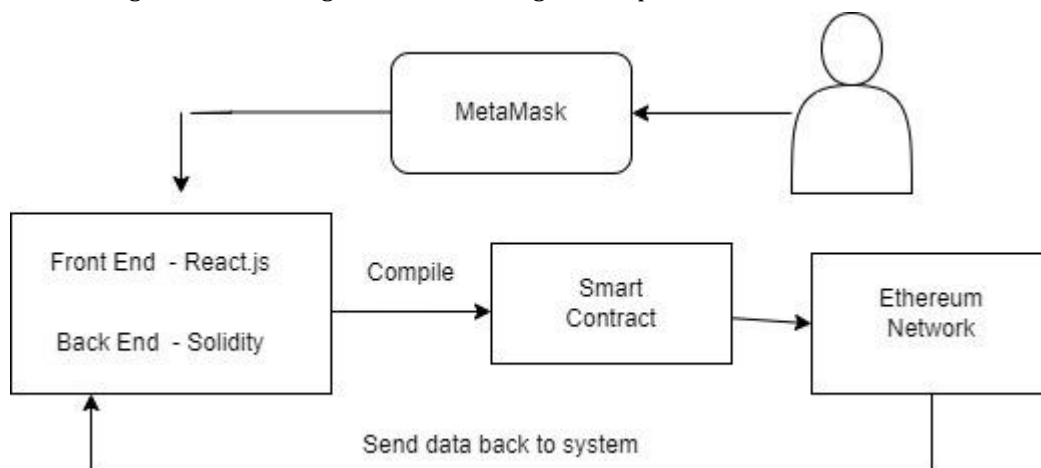


Figure 6: System Architecture

IV. METHODOLOGY

In the context of the literature review, a qualitative review of existing documents on blockchain-based solutions in crowdfunding platforms was included. This will include identifying related documents, reviewing their contents, and synthesizing key findings and insights from documents includes a design for searching and data selection, as well as critical evaluation of the quality and accuracy of data, information. Research also includes a meta-analysis or analysis of data to identify trends, patterns, and areas for future research. Also analyze research content and data, scan and select data according to inclusion criteria, extract and analyze data from selected data, and collect results to determine current state of knowledge in the field. An investigation may also include a critical assessment of the quality of the studies reviewed and an assessment of the overall strength of the evidence.

V. ADVANTAGES

Transparency and Trust: Blockchain provides a transparent and immutable ledger of transactions, ensuring that all crowdfunding activities and transactions are recorded and visible to all participants. Smart contracts on the blockchain can automate the execution of crowdfunding agreements, ensuring transparency and reducing the need for intermediaries. Participants can verify and audit the transactions and flow of funds, fostering trust between project creators and backers.

Security: Blockchain utilizes advanced cryptographic techniques to secure transactions, making it highly resistant to fraud, tampering, or unauthorized access. Funds raised through crowdfunding can be securely stored in blockchain-based wallets, reducing the risk of theft or loss associated with traditional banking systems.

Global Accessibility: Blockchain technology enables global participation in crowdfunding campaigns, regardless of geographical location or access to traditional financial infrastructure. Anyone with an internet connection and a cryptocurrency wallet can participate in crowdfunding campaigns, fostering inclusivity and expanding the pool of potential backers.

Immutability: Blockchain is a distributed ledger containing numerous copies, making it nearly hard to edit a single transaction without changing all the copies at once. Because of this, using blockchain in the crowdfunding increases trustworthiness and fraud resistance.

Reduced Intermediaries and Costs: By leveraging blockchain, crowdfunding platforms can eliminate or reduce the need for intermediaries, such as banks or payment processors, which can lower transaction fees and administrative costs. Smart contracts can automate the distribution of funds and disbursements to project creators, streamlining the process and reducing overhead expenses.

VI. DISADVANTAGES

Complexity and Technical Knowledge: Blockchain technology is still relatively complex and requires specialized knowledge for development, implementation, and maintenance. This can create barriers for non-technical users or project creators who may not be familiar with blockchain concepts or have the technical expertise to navigate the platform.

Volatility and Risk: Cryptocurrencies, often used for transactions on blockchain-based crowdfunding platforms, can be subject to significant price volatility. This introduces risk for both project creators and backers, as the value of funds raised or pledged can fluctuate during the campaign, affecting the project's financial viability or backers' potential returns.

Scalability: Due to the fixed size of the block used to store information, it is one of the main shortcomings of blockchain technology. Due to the 1 MB block size, only a few transactions may be stored on a single block.

Storage: The fact that blockchain databases are kept on every node of the network causes a storage problem; as the volume of transactions rises, more storage space will be needed. **Time-Consuming:** Since miners must compute nonce values numerous times to add the next block to the chain, this time-consuming procedure needs to be sped up to be employed for commercial purposes.

Irreversibility of Transactions: Once transactions are recorded on the blockchain, they are typically irreversible. In the context of crowdfunding, this means that backers may not have recourse if a project fails to deliver on its promises or turns out to be fraudulent. This lack of dispute resolution mechanisms can pose risks

for backers who might encounter project-related issues.

VII. CONCLUSION

The crowdfunding platform is using blockchain technology to improve transparency and reduce the risk of fraud. Traditional crowdfunding methods have often been criticized for their lack of transparency and susceptibility to fraud, and this project aims to address these issues by providing a more trustworthy platform for people to contribute their money to good causes. By using blockchain, we hope to build confidence and trust among users, allowing them to feel more secure in their donations. In crowdfunding, blockchain allows decentralization; this means that no single platform or group of platforms manages smart contracts, making it transparent to the blockchain for everyone. A peer-to-peer network is that adheres to co-protocols and can use new blocks between nodes, so no one can modify a block without approval from more than 50% of the nodes in the blockchain. it does. trustworthy. Anyone can use the blockchain to create projects on the site, and anyone with a internet connection can donate to the project. Participants needn't worry about promises that look nothing like the traditional financial aid. The smart contract will process all transactions, so all funds will be stored in smart contract instead of being sent to third parties. Blockchain gives more freedom to project managers and partners so that partners can be part of the project. Overall, the survey shows the growing interest and potential of blockchain technology in crowdfunding.

VIII. REFERENCES

- [1] M. Zichichi, M. Contu, S. Ferretti and G. D'Angelo, "LikeStarter: a Smart-contract based Social DAO for Crowdfunding," IEEE INFOCOM 2019 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS), Paris, France, 2019, pp. 313-318.
- [2] Bhavya Sri, K., et al. "Crowdfunding Using Blockchain," International Journal of Scientific Research in Computer Science, Engineering and; [Information Technology, Mar. 2020, pp. 128-34. DOI.org (Crossref), <https://doi.org/10.32628/CSEIT1206233>.
- [3] N. Yadav and S. V., "Venturing Crowdfunding using Smart Contracts in Blockchain," 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT), Tirunelveli, India, 2020, pp. 192- 197.
- [4] Siriphong Sirisawat, Pattanaporn Chatjuthamard, Supapor Kiattisin, and Sirimon Treepongkaruna, "The Future Of Digital Donation Crowdfunding", 2019.
- [5] Hasnan.Baber, "Blockchain-Based Crowdfunding A "Pay-it Forward' Model of WHIRL", 2019.
- [6] Vikas Hassija, Vinay Chamola, and Sherali Zeadally, "BitFund: A Blockchain-based Crowd Funding Platform for Future Smart and Connected Nation," 2020 pp. 1- 17.
- [7] Viren Patil, Vasvi Gupta, Rohini Sarode, "Blockchain-Based Crowdfunding Application," 2021, pp. 1546 - 1553.
- [8] Sayyam Gada, Smita Bansod, Akash Dhuri, Denish Jain, Dhanashree Toradmalle, "Blockchain-Based Crowdfunding: A Trust Building Model," International Conference on Artificial Intelligence and Machine Vision (AIMV), 2021.
- [9] Ashari, Firmansyah. "Smart Contract and Blockchain for Crowdfunding Platform,". International Journal of Advanced Trends in Computer Science and Engineering, vol. 9, no. 3, June 2020, pp.3036-41.DOI.org(Crossref).
- [10] Dhokley, Er. Waheeda, et al. "Crowdsourcing and Crowdfunding Platform Using Blockchain and Collective Intelligence,". International Journal of Computer Sciences and Engineering, vol. 7, no.2, Feb. 2019, pp. 668-73. DOI.org (Crossref),<https://doi.org/10.26438/ijcse/v7i2.668673>.