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Crowdfunding Platform with Blockchain Integrity

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Abstract - *Crowdfunding is a method of obtaining money for a project by asking a lot of people for modest donations, usually online. Nowadays, the biggest issue with crowdfunding is the trust component. People are reluctant to donate because of the increasing number of frauds that are occurring today. However, if donors could be assured that their money would be put to good use, donations may rise significantly. The need to employ blockchain in crowdfunding arises here. With the blockchain system, transactions are tracked over a network of computers that are connected to one another. On the flip side, crowd funding platforms reverse that process entirely. They provide entrepreneurs with a centralized platform to create, display, and distribute their pitch materials, significantly simplifying the conventional model*

Keywords: Crowdfunding, Blockchain Technology, Smart Contracts, entrepreneurial finance, donations.

1.INTRODUCTION

This type of crowdfunding is the practice of raising money from different groups of people, often using the advantage of access to the internet to attract supporters. This approach covers a wide range of sectors, including private equity, real estate, lending, startups and non-governmental organizations (NGOs), making it a better option for business people.

The emergence of blockchain technology has opened new possibilities for problem solving. The competition is in crowdfunding. Leveraging blockchain's unique decentralization, transparency and security features, the technology provides a tamper-proof, decentralized ledger for secure and transparent business transactions, eliminating the need for those who need it. This has great potential to appeal to the crowd and encourage direct and transparent interaction between sponsors and supporters. The choice of public service model is often based on the business or competition to be pursued, and business objectives also have a significant impact. Crowdfunding is a popular method used to raise funds for various projects, causes, and initiatives. Traditional crowdfunding platforms, however, are often centralized and have limitations in terms of accessibility, transparency, and security. With the advent of blockchain technology, crowdfunding has the potential to become more decentralized, transparent, and secure. This project is an implementation of a decentralized crowdfunding platform using blockchain technology. It is built on the Ethereum blockchain and uses smart contracts to manage the crowdfunding process. The platform allows campaign creators to create a campaign and set a fundraising goal and deadline. Donors can then contribute to the campaign using Ether, the native cryptocurrency of the blockchain. One of the key advantages of using a blockchain-based crowdfunding platform is that it eliminates the need for intermediaries such as banks, payment processors, and crowdfunding platforms. This reduces costs, enhances transparency, and provides greater control and security to both campaign creators and donors. Smart contracts ensure that funds are only released when certain predetermined conditions are met, providing greater accountability and trust. There are various types of crowdfunding, including:

1.1 Debt-Based crowdfunding

In this model, investors generally expect to get paid back in cash and interest, bypassing the banking system. This approach, called “peer-to-peer” lending, provides another means of financial support[2].

1.2 Equity based crowdfunding

In this way, investors have partial ownership of the project and are entitled to receive dividends. However, like gambling, this approach has risks because the success or failure of the project directly affects the price of the stock.[1] As shareholders, your backers earn a financial reward for their investment and ultimately gain a portion of the profits through dividends or distributions.

1.3 Rewards-Based Crowdfunding

In this type of crowdfunding, individuals contribute to a project in exchange. For rewards, which can be either monetary or in the form of a product. Numerous platforms now utilize this type of crowdfunding.

2. CROWDFUNDING USING BLOCKCHAIN

Implementing blockchain technology in crowdfunding introduces a decentralized approach, which eliminates the dominance of a single entity over the management of funds. This decentralization is achieved through smart contracts that are transparent and accessible to everyone on the blockchain network. The technology operates on a peer-to-peer basis, adhering to specific protocols for communication and the validation of new blocks. This setup ensures that altering any information within a block would require the consensus of more than half of the network's nodes.

Blockchain's accessibility allows anyone with an internet connection to initiate or contribute to a project directly on the platform. This contrasts with traditional crowdfunding, where contributors might be concerned about the potential mismanagement of their funds. In blockchain-based platforms, smart contracts automate transactions, securely holding funds until predetermined conditions are met, thereby reducing the reliance on third-party intermediaries.

Moreover, blockchain empowers project creators and supporters by facilitating fractional contributions, which can lower the barriers to entry for funding. This flexibility is a significant shift from traditional fundraising methods, which often involve more rigid structures for contributions and fund management.

3. LITERATURE REVIEW

A study on crowdfunding and its implications in India has shown that this method offers numerous advantages compared to existing ways available for new companies and SMEs. However, since crowdfunding is not available to the open public, it can be difficult to attract investors to new ventures. Nonetheless, the younger generation has more knowledge about crowdfunding, which provides a good starting point for this funding platform to grow. This will allow new ventures to reach out to a wider segment of investors and financial specialists for raising capital. Huasheng Zhu and Zach Zhizhong Zhou have analyzed that blockchain is still an emerging technology in the exploratory stage, and there are many technical and legal issues that need to be considered before making it available to the public. They suggest that there is still room for improvement for blockchain business and market influencers to work together and change the business, deploy blockchain technology in the market, and introduce innovative ideas.

They also argue that it is crucial to develop a better understanding of blockchain innovation, its worth, chances, and dangers. Moreover, they emphasize the importance of effectively advancing blockchain applications in the Chinese crowdfunding market to achieve monetary proficiency and social benefits through technical advancement and blockchain applications. Michael Gebert [7] has discussed the importance of blockchain technology in crowdfunding for small-scale businesses. Startups often face employment crises and insecurity, so it is crucial for governments to provide access to funds for small enterprises. In Europe, crowdfunding has not been successful due to a non-favorable government environment. Therefore, the growth of the crowdfunding platform is important to help small-scale businesses raise funds. In the paper "Crowdsourcing and Crowdfunding Platform using Blockchain and Collective Intelligence" [8], the authors analyze that crowdfunding and crowdsourcing in India are still in their early stages. Although the concept of internet crowdfunding is relatively new, the Indian population has not widely accepted it. Despite the initial challenges, the future of crowdfunding and public support in India is promising. Business capital and human resources are essential requirements for any business, particularly for startups and low-level organizations that struggle to combine resources. Utilization of blockchain technology in engineering will help in the security aspect of the framework. The potential for such platforms in India is excellent, but public participation is crucial to make it successful.

4. System Design

This implementation for a crowd funding platform is designed to be simple, secure and efficient. It allows anyone to create a campaign and anyone to donate Ether to support a campaign. The use of block chain ensures that all transactions are executed in a transparent and secure manner, without the need for intermediaries.

4.1 Campaign Creation - Anyone can create a campaign by providing the necessary parameters, including the campaign owner's address, title, description, target amount in Ether, deadline in Unix timestamp format, and an optional campaign image. The function returns the ID of the created campaign, which can be used for donating to the campaign or getting information about the campaign.

4.2 Donation - Anyone can donate to a campaign by specifying the campaign ID and sending Ether along with the transaction. The smart contract adds the donor's address and donation amount to the campaign's 'donators' and 'donations' arrays, respectively. It then sends the donated Ether to the campaign owner's address. If the transaction is successful, the amount collected by the campaign is updated.

4.3 Campaign Information - The smart contract provides two functions to retrieve information about the campaigns and their donors. The 'getCampaigns' function returns an array of campaign structs, where each struct contains the campaign owner's address, title, description, target amount in Ether, deadline in Unix timestamp format, an optional campaign image, amount collected in Ether, and arrays of donor addresses and donation amounts. The 'getDonators' function takes the campaign ID as input and returns two arrays - an array of donor addresses and an array of donation amounts.

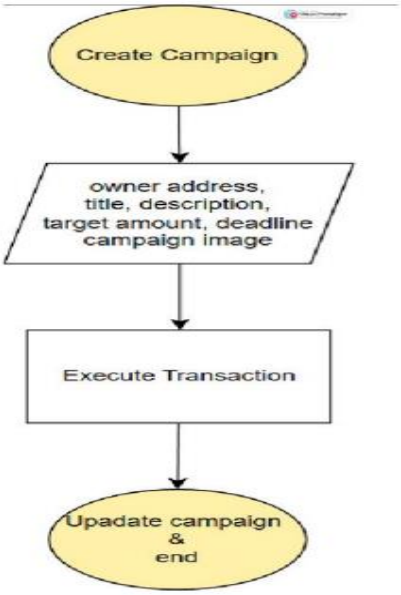


Figure 1 Create Campaign Donate

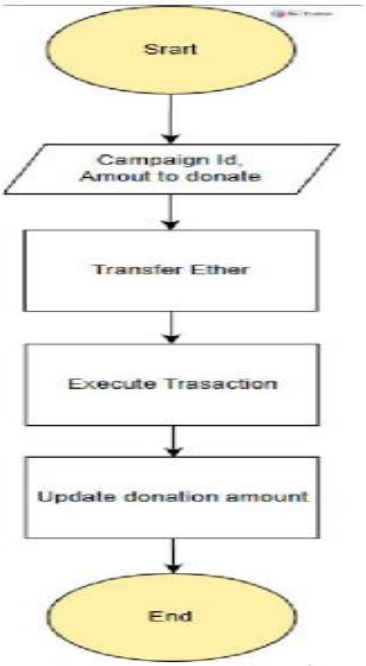


Figure 2 Create Campaign Donate

4.4 Actors:

4.4.1 Donors: Donors can view the list of active campaigns by calling the getCampaigns function. They can choose a campaign they are interested in and view its details, including the amount collected so far and the list of donors and their donations by calling the getDonators function. To donate to a campaign, the donor can call the donateToCampaign function and specify the campaign ID and the amount they wish to donate. Once the transaction is complete, the donated amount will be added to the amount collected for the campaign.

4.4.2 Campaign Owner: The owner of a particular campaign is responsible for managing it. They can view the list of donors and their donations by calling the getDonators function. They can also withdraw the amount collected so far by calling the withdraw function, which transfers the funds to their account

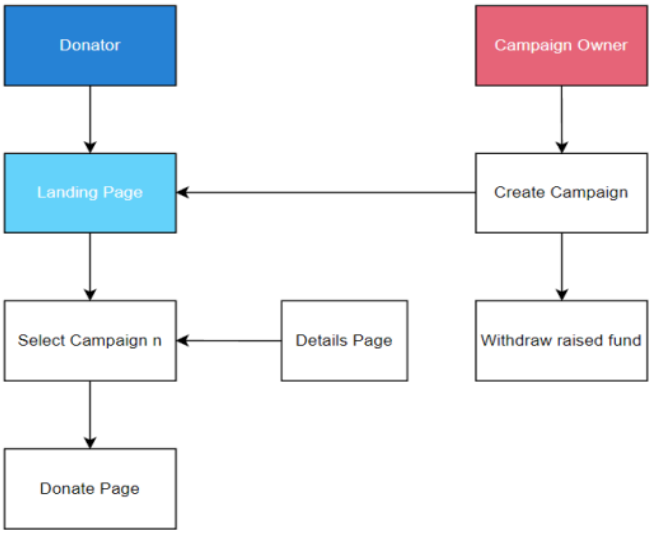


Figure 3 Crowdfunds Actors and Working

5. WORKING FLOW DIAGRAM

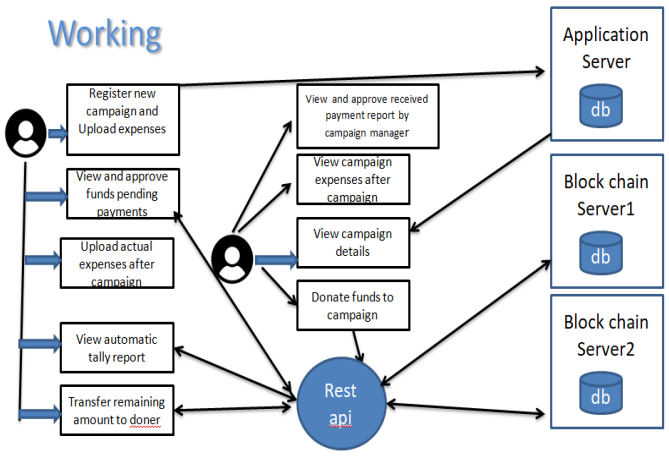


Figure 4 Working Flow Diagram

1. The process begins with the campaign manager registering a new campaign and uploading the expenses.

2. Donors can then donate funds to the campaign.

3. The campaign manager can view and approve the payment reports.

4. Once the campaign is over, the campaign manager can upload the actual expenses.

5. The campaign manager can then view the campaign details.

6. An automatic tally report is then viewed.

7. Finally, the remaining amount is transferred to the donors.

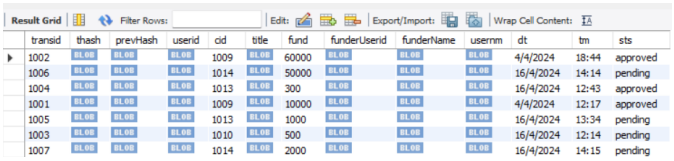
6. Result of Crowdfunding platform

Blockchain based crowdfunding platform the transactions is stored in database but each transaction have it unique hash value which is generated by hashing algorithm that is SHA-2.

SHA-2 is a set of cryptographic hash functions designed by the United States National Security Agency and first published in 2001. They are built using the Merkle–Damgård construction, from a one-way compression function itself built using the Davies–Meyer structure from a specialized block cipher. SHA-2 is a family of hashing algorithms to replace the SHA-1 algorithm. SHA-2 features a higher level of security than its predecessor.

Each transaction hash value is linked with the previous transaction hash value and that how the chain like structure is formed in database and blockchain structured block is created having field as transid, thash, prevHash, userid, cid, title, fund, funderUserid, funderName, usernm, dt, tm, sts.

Result grid as follows:



transid	thash	prevHash	userid	cid	title	fund	funderUserid	funderName	usernm	dt	tm	sts
1002	BLOB	BLOB	BLOB	1009	BLOB	60000	BLOB	BLOB	BLOB	4/4/2024	18:44	approved
1006	BLOB	BLOB	BLOB	1014	BLOB	50000	BLOB	BLOB	BLOB	16/4/2024	14:14	pending
1004	BLOB	BLOB	BLOB	1013	BLOB	300	BLOB	BLOB	BLOB	16/4/2024	12:43	approved
1001	BLOB	BLOB	BLOB	1009	BLOB	10000	BLOB	BLOB	BLOB	4/4/2024	12:17	approved
1005	BLOB	BLOB	BLOB	1013	BLOB	1000	BLOB	BLOB	BLOB	16/4/2024	13:34	pending
1003	BLOB	BLOB	BLOB	1010	BLOB	500	BLOB	BLOB	BLOB	16/4/2024	12:14	pending
1007	BLOB	BLOB	BLOB	1014	BLOB	2000	BLOB	BLOB	BLOB	16/4/2024	14:15	pending

Figure 5 Transactions in Database

The hash value of first transactions using SHA-2 algorithm is
b281bc2c616cb3c3a097215fdc9397ae87e6e06b156cc34e656be7a1a9ce8839

Figure 6 Hash value of first Transaction

So in this structure blocks are created in database and linked with one another itself.

6. BENEFITS OF CROWDFUNDING

Blockchain-enabled crowdfunding offers a paradigm shift in fundraising, bringing transparency, accessibility, and security to the forefront. By leveraging blockchain technology, transactions are recorded transparently and securely, minimizing the risk of fraud and enhancing trust among investors and creators alike. The global nature of blockchain enables a broader pool of investors, transcending geographical boundaries and unlocking new investment opportunities. With intermediaries removed from the equation, costs are reduced, and processes are streamlined, making crowdfunding more efficient and cost-effective. Smart contracts automate the execution of agreements, ensuring funds are disbursed according to predefined conditions. Additionally, tokenization facilitates liquidity, enabling easy trading of assets on secondary markets. Enhanced security measures safeguard investors' funds and personal data, instilling confidence in the crowdfunding ecosystem. Overall, blockchain-enabled crowdfunding offers a transformative solution, revolutionizing fundraising with its transparency, accessibility, efficiency, and security features.

7. CONCLUSIONS

Online crowdfunding has revolutionized fundraising by providing a digital platform for individuals to seek support for their projects through online marketing. This approach allows interested parties to secure financing, which is distributed to project managers to complete the project or production. Undoubtedly, crowd funding is increasingly recognized as a viable avenue for raising capital for start-ups and emerging businesses. There are notable concerns underscoring the necessity for regulatory oversight. India may soon implement legislation to support this, recognizing the potential of an effective crowd funding system to catalyse the realization of start-up ventures.

Integrating blockchain technology into crowdfunding represents a cutting-edge concept that is still in its infancy in the world. While the world is slowly adopting blockchain and cryptocurrencies, widespread adoption of Ethereum-based decentralized applications (DApps) is still years away. Therefore, it is still difficult for many people to understand the inconsistencies of blockchain-based crowdfunding platforms.

But the emergence of blockchain-based crowdfunding applications has the potential to enable transactions in a decentralized manner. These platforms aim to promote trust and accountability throughout the crowdfunding process by using blockchain technology. In addition, these initiatives also work for technical education, providing information on various budgets and ways to finance various activities. By supporting more direct and secure ways to raise money, blockchain-based crowdfunding apps seek to provide free

access to money to ensure new ideas have a chance to emerge in the clear.

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