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# DESIGN AND DEPLOYMENT OF SMART CONTRACT FOR CROWDFUNDING

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## 1. 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 existing solution emphasised need for a decentralised and transparent platform that bypasses traditional financial intermediaries. The shortcomings addressed were high transaction costs, lack of transparency, and the risk of fraud, which can discourage potential investors and restrict the growth of crowdfunding. Crowdfunding is a new and innovative method for funding various kinds of ventures, wherein individual founders of the ventures can request for funds. The ventures may be working for profit motive, cultural or social.

## 2. Introduction

Crowdfunding is a method for funding various kinds of ventures, wherein individual founders of the ventures can request for funds. The ventures may be working for profit motive, non-profit motive, cultural or social. The funds are usually given in return for future products or equity. The ventures may be working for profit motive, cultural or social. The funds are usually given in return for future products or equity. It includes the use of internet social media platforms to connect investors with entrepreneurs in order to raise capital for various kinds of ventures in return for compensation. Internet and social media became new platforms that emerged.

Social media and internet play vital role in raising funds for entrepreneurs and other non-profit organizations. Due to recent times of Covid-19 pandemic across various countries in the world – including developed countries like USA, Russia etc., 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. Blockchain is a

unique, independent and a transparent system which keep the transactions between parties transparent. Crowdfunding is based on the trust between the investors and stakeholders. Traditional platforms act as intermediaries with fees and control. In our proposed system, we are using blockchain in crowdfunding. With the blockchain system, transactions are tracked over a network of computers that are connected to one another. This project discusses the shortcomings of the present crowdfunding systems in use and makes recommendations for how to make things better. Due to the current era of technology, the use of internet social media platforms to connect investors with entrepreneurs in order to raise capital for various kinds of ventures in return for compensation or just with a motive to help the noble cause. The issue with today's crowdfunding method is that fundraisers and contributors have no control over the funds they donate and some more like Scam-start-ups, Intellectual Property risk, exorbitant fees.

These issues in addition to solving an issue or helping a noble cause, raises few other problems and for few, it won't allow to contribute. This project creates a platform that presents a block-chain-based crowdfunding network that can provide a private, secure, and decentralized crowdfunding path by using smart contracts. The aim is to solve these problems by applying smart contracts to the crowdfunding site so that the contracts will be fully automatically executed so that frauds can be prevented and a healthy relationship is built between the fundraisers, platform and the contributors.
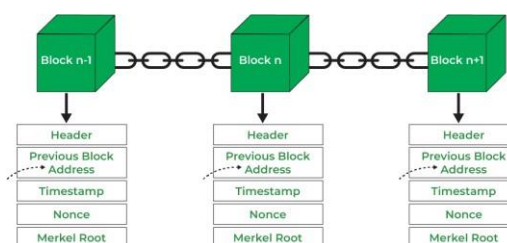


**Fig1.Block Chain flow**

## 3.Literature review

The exhaustive literature review was carried out to encompass various aspects of crowdfunding, highlighting its significance and evolving nature in the financial landscape. Researchers found that there is a need for an integrated framework to understand the determinants affecting crowdfunding success. Project- and creator-related factors have been extensively studied, but their impact on success varies due to inconsistent measurement approaches [5]. Researchers define crowdfunding as an innovative financing strategy that leverages contributions from the general public rather than traditional sources like bonds or bank loans. The review aims to identify determinants influencing crowdfunding success, emphasizing the need for a unified framework due to inconsistent findings in empirical papers. A study revealed that early-stage Technology-Based Companies (TBCs) in Brazil choose reward-based crowdfunding due to their early development stages, project-specific financing needs, and non-financial motivations. Regulatory elements for crowdfunding in India were also highlighted. The research on crowd funding focuses on the growth of crowdfunding, especially among young entrepreneurs. It discusses their limited knowledge of crowdfunding and the perceived benefits and barriers associated with it. Another

study examines the dynamics of success and failure in crowdfunded ventures, emphasizing the importance of personal networks, project quality, and geographical factors [6-8]. A study revealed that early-stage Technology-Based Companies (TBCs) in Brazil choose reward-based crowdfunding due to their early development stages, project-specific financing needs, and non-financial motivations. Regulatory elements for crowdfunding in India were also highlighted [9]. Furthermore, the review explores the motivations behind using reward-based crowdfunding in Brazil, revealing that early-stage companies opt for this model to finance specific projects and for non-financial motivations. Ethical considerations are also discussed, underscoring the need for scholarly debate and further research in the crowdfunding field. Young entrepreneurs, particularly students, were found to have moderate knowledge of crowdfunding. They tend to underutilize crowdfunding's various business models, especially those related to investment (lending and equity). The integration of blockchain technology in crowdfunding is another significant topic. It points out that blockchain enhances trust and credibility in crowdfunding campaigns, bringing transparency and freedom to donors and recipients. Smart contracts on the blockchain are shown to mediate risks and automate processes in crowdfunding. Success in crowdfunding efforts was associated with personal networks, project quality, and geographic factors. While most founders fulfill their obligations to funders, many deliver products later than expected, often correlated with the funding levels received [10]. Blockchain technology enhances trust and credibility in crowdfunding campaigns. The use of blockchain-based smart contracts was identified as a way to mediate risks, automate processes, and provide immutable tokens to investors.

## 4. Conceptual model design

### 4.1 System Requirement Specification

The collaborative funding and project management system is tailored to empower both creators and supporters in the most transparent and efficient way possible. The key features for the cutting-edge system implementation are enumerated below:

Project Customization: The proposed platform empowers managers to deploy projects with tailored attributes, including setting targets, deadlines, and minimum contribution thresholds. This flexibility ensures that each project aligns perfectly with its unique goals. Effortless Contribution: Contributors can effortlessly send ETH to support projects, with the convenience of making multiple contributions if they wish. Comprehensive Tracking: The system keeps a meticulous record of essential data, such as the number of contributors, individual contributions, and the total funds raised by each project adhering to the transparency motive of blockchain solution.

### 4.2 System Validation Routines

System validation routines play a vital role in the software development lifecycle by confirming that the system functions correctly, meets requirements, complies with standards, and operates reliably. They contribute to a successful and efficient development process while reducing risks and enhancing user satisfaction. Contributor should not be allowed to contribute less than minimum contribution. If the same contributor contributes multiple times, he should be treated a single

contributor. System should not accept the contributions once the deadline is crossed. System should not refund before the deadline is reached. System should not refund if the target is reached.
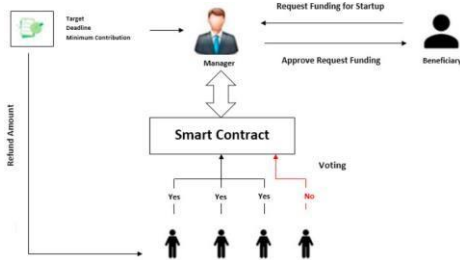


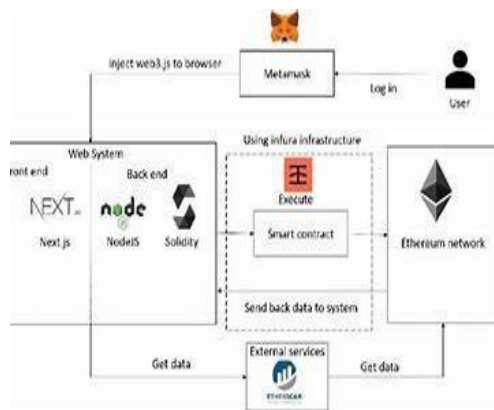Fig2. System Validation

### 4.3 System Architecture



Fig3 System Architecture

Description:

The smart-contract which is the core of the application is written in Solidity language, which is tested locally and deployed remotely to zksync platform on sepolia testnetwork via hardhat. The user will be able to access the platform through deployed web application, which is built with modern JS libraries like ReactJS, ViteJS (for fast-bundling of libraries & local server while developing) & Material UI (for ready-made UI components). The platform interacts with the deployed smart contract on zksync using web3.js and ethers.js libraries depending upon user interactions – like creating campaigns, displaying campaigns, ending campaigns, aborting campaigns, etc. To perform each interaction with the blockchain (except listing out deployed campaigns) requires wallet authentication and authorization.

## 5. Methadology

### 5.1. CONNECTING WALLET

Fundraiser Before submitting a proposal to a fundrising platform, of course fundraisers must connect to wallet in a fundraising platform service providers. of course, each service provider has its own rules who can submit proposals to find funds in their organizations. Here we are connecting to a Meta mask wallet. We need to connect to our wallet for starting a campaign and even a backer who wants to donate funds should also start with connecting wallet

### 5.2. Fundraising

Campaign To raise funds, a fundraiser must submit a proposal to the fundraising organization. each fundraising organization certainly has its own rules for publishing proposals from fundraisers. Every proposal that enters the fundraising organization certainly goes through a very strict verification process, because not all proposals from fundraisers are accepted, this could be due to the rules of the organization. This needs to be done to avoid proposals that are inappropriate for publication so as to reduce the confidence of the parties involved, especially the funders. This process involves two entities, the fundraiser and the fundraising organization. If the terms and conditions of the proposal are fulfilled, then fundraising campaign can be published by service provider of fundraising platform.

### 5.3. Donation

The funding process to provide assistance to fundraisers, of course, begins with funder conducting surveys of many proposals issued by fundraisers. If the fund supporter gets a proposal in accordance with his wishes, the fund supporter carries out the process of giving funds through the fundraising organization or to the fundraiser directly. In general, fundraising organizations have the option to make it easier for funder to transfer funds to them. With current technology, sending funds can be done using electronic money, virtual accounts, bank transfers can even be done through traders who work with these fundraising organizations. In this case, easier or more options for transferring funds, directly affect the willingness of funder to make transactions back at the fundraising organization. Not all fundraising organizations have the ability to integrate with the above entities, but in general the entities involved in this process are funder, fundraisers and banks where temporary funds are stored. all historical transactions must be stored in a fundraising organization or fundraising platform service provider.

### 5.4. Disbursement

The last major of usecase is the disbursement of funds. In the process of disbursing funds, of course, each fundraising organization has its own terms and conditions. In this process, it generally takes time because they have to go through the verification process and the process of disbursing funds. For organizations that do not yet have the technology to make online disbursements, fundraisers must of course have to process the disbursement of funds manually by following up on proposals previously given. Conversely, for

organizations that already have web portals and mobile applications, it is certainly easier for funders to withdraw funds
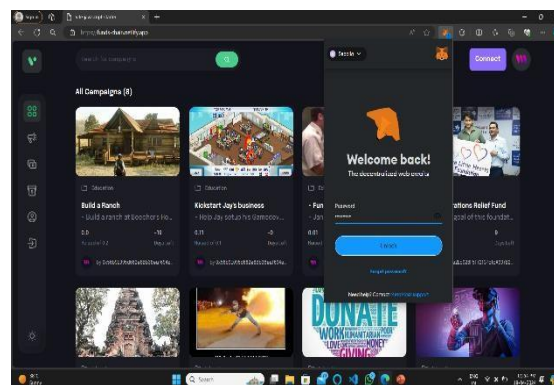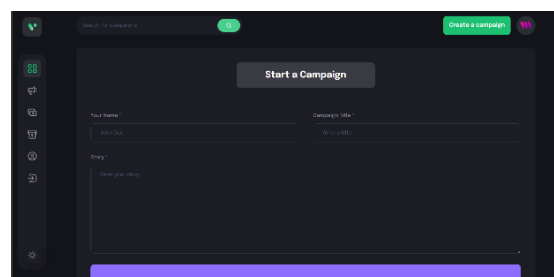
## 6.EXPERIMENTAL RESULTS:
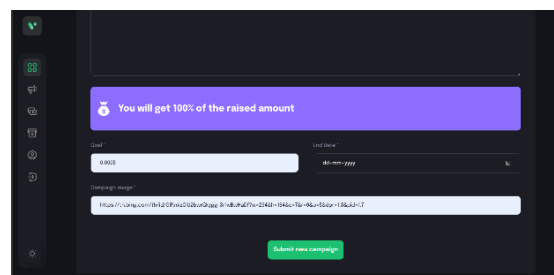


Fig.4 Connecting to wallet

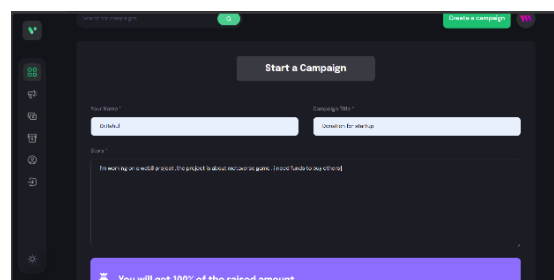

Fig.5 Start a campaign



Fig.6 Enter details
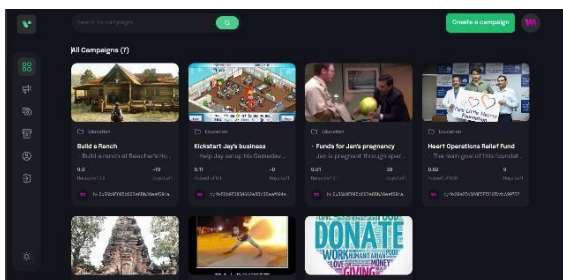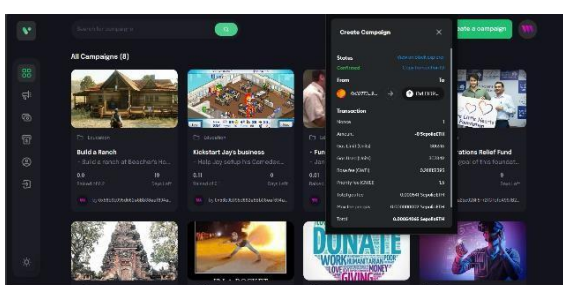


Fig.7  Submit the campaign

Fig.8 Campaign got created
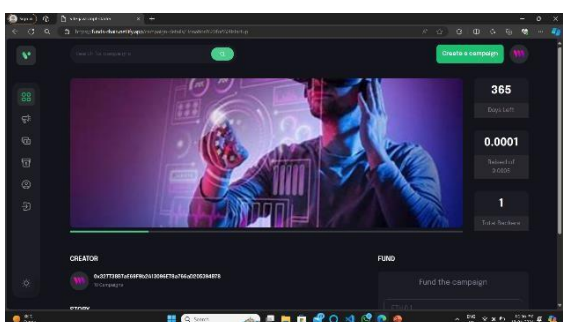


Fig.9 Transaction got successful



Fig.10 Track campaign details

**7. Conclusion and Scope for Future**: Conventional crowdfunding methods have long suffered from lack of transparency and fraud. It is an avoidable problem, and we believe that we have implemented a solid solution that can do away with these long-standing problems. The aim to have a transparent, anti-fraudulent, decentralized platform has been achieved to a great extent. This project has covered the weak points of general crowdfunding platforms to provide transparency to the process of crowdfunding and build trust among people, so that they may contribute their wealth to good causes without fear of fraud.

The collaborative funding and project management system outlined in this document aims to create a transparent and efficient crowdfunding platform for both project creators and contributors. It features project customization, easy contribution options, comprehensive tracking, refund mechanisms, exclusive voting, and efficient task funding. The validation routines of the system ensure that contributions meet minimum requirements, prevent duplicate contributions, enforce deadlines, and manage refunds based on project targets. The system architecture is designed with multiple layers, utilizing React.js for the user interface, hardhat.js for Ethereum interaction, and zksync for initial deployment and testing. Future work could include deploying the smart contract on the Ethereum mainnet for real-world use, enhancing the user interface, integrating the system with real projects, and exploring additional features. Gathering user feedback and conducting real-world experiments will be crucial to validate the system's effectiveness and userfriendliness. Reliability in a blockchain is ensured by the inherent consensus mechanism of the deployed network. In the current prototype using zksynx, a simplified Proof of Authority (PoA) consensus algorithm is employed. However, for the production release on the Ethereum Mainnet, the consensus mechanism shifts to Proof of Stake (PoS) for enhanced reliability. To enhance blockchain performance, one can explore scalability solutions like Layer 2 Polygon technology, which is beyond the scope of this paper and is included as a potential avenue for future research and implementation.

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