ADVANCED GENERATION OF PRIVATE AND COMMUNITY CROWDFUNDING PLATFORM FOR INVESTORS

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Abstract

Lately, many creative people are using Crowdfunding to raise money for their ideas through the use of an online platform. The use of third-party middlemen who cannot guarantee the investor's money and the lack of investor control over how their money is used are two issues with the current crowdfunding approach.

On the other hand, blockchain technology is safe, trustworthy, and decentralised network has become highly popular across many varieties of organisations due to its effectiveness when compared to more traditional ways. However, older techniques have a lot of issues and challenges because of their complex and less secure networks. We can address and avoid these issues if we start incorporating blockchain technology. Blockchain technology can be used to address these problems since it provides benefits including increased security, transparency, efficiency, and reduced fraud risk.

Here, we propose a new crowdfunding platform based on blockchain innovation that provides a decentralised and transparent process. By enabling users to construct smart contracts that give them control over the invested cash, our platform's major objective is to give investors the ability to successfully contribute to any private or public project. In our research, we have highlighted the variations between blockchain-based and traditional crowdfunding platforms and the advantages of using blockchain for various industries. We also discuss the challenges that established sectors face and how blockchain-based platforms could potentially help to address these challenges.

Index Terms—Crowdfunding, Blockchain Technology, Secure Networks, Decentralization, Smart Contracts

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I. INTRODUCTION

Blockchain technology is one of the domains that has recently experienced a lot of recognition and research in recent years. Several sectors have taken notice of it because of its capacity to deliver safe, open, and decentralized solutions. (S Gada et al., 2021) brings up that the crowdfunding sector, which has seen a sharp increase in popularity over the past ten years, is one example of one such business. Many individuals and people from various businesses use crowdfunding techniques to finance their ideas and initiatives. (K. Bhavya Sri et al., 2019) comments that the development of blockchain technology has made crowdsourcing even more available and effective. This survey paper addresses a crowdfunding platform that makes use of blockchain technology to simplify fundraising efforts for startups and NGOs.

Rather than deploying Web-2 platforms like Kickstarter, blockchain-based crowdfunding is more advantageous. It ensures that all transactions and changes are recorded immutably and offers transparency and trust through decentralised architecture and smart contracts. With voting rights or ownership stakes in projects, blockchain crowdfunding gives contributors more control and ownership over their donations. The expenses associated with using intermediaries are decreased for both project developers and investors. (Sumukha et al., 2022) acknowledges that blockchain-based crowdfunding promotes inclusivity, reduces fraud, enables global fundraising, and offers automation, scalability and flexibility for crowdfunding campaigns.

The proposed crowdfunding platform will allow NGOs to ask for funding and startups to invest. Investors will receive some shares of the startup along with voting rights. Similarly, people giving funding to NGOs will also receive a voting right. The platform ensures that funds and investments NGOs and startups receive are used transparently and efficiently. Investors can vote for or against the use of these funds and investments, and if 51% of the people agree to the use of funds, after that, it can be used. The paper is structured into several distinct sections, including Objective, Related Work, Proposed Work, Methodology, Techniques Used, Results, Conclusion, Future Scope and References. Each section provides essential information related to our proposed crowdfunding platform. The paper is thoughtfully organized into distinct sections, commencing with an abstract Section that furnishes a comprehensive overview of the paper. This is followed by a detailed introduction Section to the project and its contents. The section of the literature survey presents a comprehensive survey that offers a synopsis of prior projects related to the topic, while the Section on Related Works compares similarities between this project and the works cited in the literature survey. The section of the proposed work offers a lucid and straightforward explanation of the project. The diagrams in the proposed work give the explanation in a simpler way. The Section of Conclusion, concludes the project by summarizing the topic, while the Section of Future scope explores the projects and planned content additions following successful implementation. Finally, the last Section provides references sourced from various publications and conference papers.

II. LITERATURE SURVEY

Sr No.	Paper Info	Postive Points of Publication	Research Gap
1.	Crowd funding using Ethereum Blockchain, 2022	Adecentralized crowdfunding platform used in the article uses smart contracts to automate the funding process and do away with middlemen like banks or crowdfunding firms. It employs Metamask, Ethereum, and Solidity	Shareholding rights are not available.
2.	De-centralized Fundraising using Blockchain, 2022	This paper contributes a thorough summary of blockchain technology encompassing its decentralized and secure nature, as well as its usage in public, privateand hybrid lockchains. Furthermore, it discusses the benefits of using blockchain forcrowd funding , such asincreased transparency and security	Gives priority to raise funds for thecurrent calamitous events.
3.	Blockchainbased Crowdfunding: ATrust Building Model, 2021	As a result of using blockchain technology, Ethereum, Solidity smart contracts and digital identity verification, a protected and unambiguous crowdfunding platformwas created.	Same types of campaigns are available in the project. No Shareholding rights.

4.	Roleof Blockchain Technol- ogyin Crowdfunding (International Banking and Finance), 2021	In this situation, money is typically given in exchange for potential goods or equity. It also covers the use of online social media platforms to link investors and business owners in order to raise money for various enterprises in exchange for rewards.	Focuses on the banking sector and not on the community or private projects to invest in.
5.	De- centralized Crowdfunding platform using Ethereum Blockchain Technology, 2021	The article points out crowdfunding as a blueprint to explore the benefits of executing blockchain-based solutions in various businesses. Additionally, based on Ethereum's blockchain technology, it proposes a new technique, which offers greater security, transparency and effectiveness. In this situation, money is typically given in exchange for potential goods or equity. In order to raise money for various enterprises in exchange for rewards, it covers the use of social media platforms to link business owners and investors.	A single type of campaign is been introduced.
6.	Venturing Crowdfunding using Smart Contracts in Blockchain, 2020	The goal of this study is to enable investors to effectively fund any project by using smart contracts that provide investors control over their investment funds and enable project creators and investors to efficiently raise and reserve financing for the project.	Share holding rights are not available in this project.
7.	Blockchain based crowdfunding systems, 2019	It touches upon a crowdfunding model that motorizes the funding process, eradicates intermediaries, and guarantees transparency and accountability by employing smart contracts on the Ethereum blockchain.	Voting system is absent for the investors. A single type of campaign is available.

III. OBJECTIVE

The objective of this research paper is to evaluate the prospects of blockchain-based crowdfunding platforms for NGOs and businesses. The benefits and drawbacks of adopting blockchain technology for crowdfunding analyse the attributes of the suggested platform and assess how well it works to support campaigns. We are also going to examine the prospects for future advancements in this field and analyse the effects of blockchain-based crowdfunding on the conventional crowdfunding business.

IV. RELATED WORKS

A. Vigneshwaran et al., A Survey on Blockchain-based Crowdfunding Platforms This research presents a meticulous review of the features of the major blockchain-based crowdfunding platforms. The authors also faced the difficulties and possibilities brought on by these platforms.

K. Hwang et al., article A Blockchain-Based Crowdfunding Platform with Decentralised Voting System, this paper introduces a decentralised crowdfunding platform that selects funded projects through a blockchain-based voting system. The authors contend that their system provides more security and transparency than conventional crowdfunding sites.

By P. F. Pires et al., Crowdfunding and Blockchain: A Review, Classification, and Research Agenda, this study investigates the relationship between crowdfunding and blockchain and classifies the various blockchain-based crowdfunding platforms. In addition, the authors suggest a study agenda for next investigations.

Is Decentralised Crowdfunding: The Future of Crowdfunding? by J. Zhang and L. Yu, this paper explores the potential advantages of blockchain technology for crowdfunding, including greater transparency and lower costs. Additionally, the authors describe a blockchain-based decentralised crowdfunding platform dubbed "Decentralised Autonomous Crowdfunding Organisation" (DACO).

J. Han et al., A Decentralised Voting System for Crowdfunding Campaigns, this study suggests a decentralised voting method for crowdfunding

campaigns that employ a consensus mechanism built on top of a blockchain. The authors contend that their system is more transparent and secure than conventional voting processes.

J. Chen and Y. Wu's Blockchain-Based Crowdfunding:Decentralised Funding and Voting System, this study introduces a blockchain-based platform for crowdfunding with a distributed funding and voting process. The authors contend that their method has various advantages, including increased accessibility, security, and transparency.

K. Ren et al., A Smart Contract-Based Crowdfunding Modelon Blockchain, this study suggests a blockchain-based smart contract-based crowdfunding paradigm. The authors claim that a number of advantages such as improved security, transparency and efficiency come with their paradigm. Through simulations, they assess the effectiveness of their model as well.

V. PROPOSED WORK

With the help of the collective contributions of numerous individuals, Crowdfunding has turned out as an innovative way to finance projects and businesses. (S. Zad et al., 2019) mentions that with the advent of blockchain technology, the potential of crowdfunding has increased significantly, as it offers a secure and transparent platform for the participants. Nevertheless, some obstacles in terms of accountability, transparency and fairness can yet hinder the success of existing crowdfunding campaigns.

We come up with a novel approach to crowdfunding over the Ethereum blockchain through the use of smart contracts to tackle these issues. Our approach is designed to cater to two distinct types of projects: Non-Profit/Community Driven Projects and Private Companies. For Non-Profit/Community Driven Projects, investors will receive voting rights over the spending of funds collected. The voting will be decided by a 51% per cent -majority, which will approve or reject the proposed transaction. This will ensure transparency and accountability in the process of funds collection. For Private Companies, investors will receive shares that can be cashed out at a later stage. The shares will be proportional to the amount invested and will be allocated automatically through using smart contracts. The deployment of smart contracts will be fully automated, which will reduce the need for intermediaries, and enhance the overall efficiency of the platform. The proposed approach is expected to provide a secure and transparent platform for crowdfunding that is free from the limitations of traditional crowdfunding platforms. Furthermore, it will promote fairness and accountability in the use of funds collected, which will enhance the trust of the participants in the platform. We plan to implement the proposed approach on the Ethereum blockchain and evaluate its effectiveness through simulations and real-world experiments.

Smart Contracts

An autonomous smart contract factory is a type of smart contract that is programmed to automatically create other smart contracts. It is designed to be a self-executing program that operates independently without the need for human intervention. (S. Nagaraj et at., 2022) brings up that the autonomous smart contract factory is typically programmed with a set of rules that govern how it creates new contracts. These rules may include parameters such as the contract's code, its initial state, and its access controls. Once the rules are established, the factory can create new contracts on its own, based on the specified parameters.
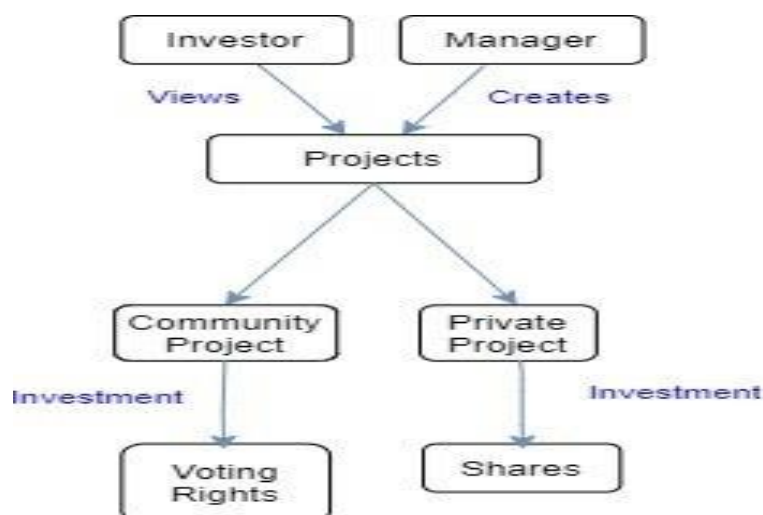

Fig. 1. Privileges granted to investors

The figure emphasizes the distinction between the two types of projects by using different visual elements and highlighting the specific benefits for each. The voting rights and shares symbolize the unique privileges granted to investors in Community-driven Projects and Private Projects, respectively. Overall, the voting system depicted in the figure illustrates how crowdfunding over blockchain using smart contracts integrates democratic decision-making and investor ownership into the crowdfunding process. We can supplement the crowdfunding experience for both project creators and investors by encompassing blockchain technology and smart contracts as this system stimulates clarity, answerability and investor empowerment.
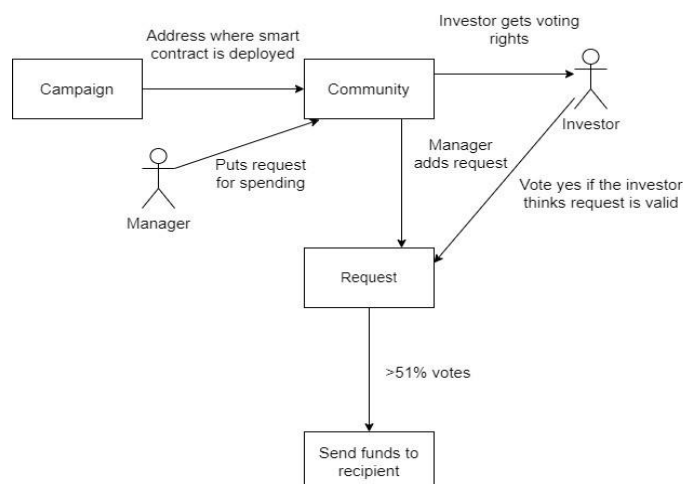

Fig. 2. Community Project System

In the case of Community-driven Projects, investors gain voting rights. The manager of the project adds the requests to be voted on by the investors. With the help of voting rights, investors can actively participate in the decision-making process regarding the allocation of funds. Investors can exercise their voting rights to express their preferences on how the project's funds should be utilized. In order to influence the project's direction and empower investors, this democratic procedure ensures that that the community's voice is heard. If the voting system gains the majority of the decisions in favour of the request the manager can finalize the request.

One potential benefit of an autonomous smart contract factory is that it can help to reduce the risk of errors or fraud that can occur when humans are involved in the creation process. (F Ashari et al., 2020) mention that by automating the creation of new contracts, the factory can eliminate the potential for human error or bias. Another advantage of an autonomous smart contract factory is that it can help to increase efficiency and reduce costs. By automating the process of creating new contracts, the factory can create contracts much faster than humans would be able to. This can help to reduce the time and cost associated with creating new contracts. (A. Choudary et al., 2021) cites that a self-governing smart contract factory has the capability to restructure the way that contracts are created and managed. It may be feasible to create a more methodical, unequivocal and assured system for managing contracts in a variety of industries as a result of using blockchain technology and smart contracts.
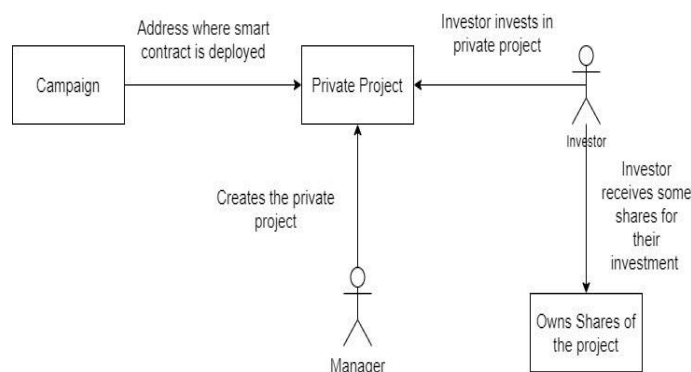

Fig. 3. Private Project System

Private Projects follow a different approach. Investors in Private Projects gain shares of the project. These shares provide investors with ownership stakes in the project and potential returns on investment. By holding shares, investors align their interests with the project's success and financial performance. The process of creating private and community campaigns is simplified and streamlined, which takes care of all the necessary steps automatically. A campaign's address is stored within the factory, permitting easy and reliable access to its functions and funding. This approach offers a number of significant benefits over traditional campaign management methods. For one, the use of smart contracts ensures that funds are managed transparently and securely, with transactions recorded on an immutable blockchain ledger that is resistant to tampering and fraud. Additionally, the automation provided by Solidity reduces the potential for human error and ensures that campaigns are executed according to their intended rules and conditions. (A. Ankita et al., 2019) mentions that the autonomous smart contract factory represents a powerful tool for organizations looking to create and manage campaigns in a decentralized and efficient manner. In summary, our proposed work aims to solve the challenges of crowdfunding over blockchain by leveraging the capabilities of smart contracts on the Ethereum blockchain. The proposed platform will provide a fair and transparent platform for both Non-Profit/Community Driven Projects and Private Companies, and we expect it to have a significant impact on the crowdfunding industry.

VI. TECHNIQUES USED

The technology we have used in this paper is that mappings and arrays in Solidity have their own use cases and benefits depending on the specific requirements of the smart contract. (M. Kaydawala et al., 2020) cites that mappings are typically used to associate values with keys, similar to a dictionary or hash map in other programming languages. The key-value pairs in mappings are stored in a way that allows for constanttime lookups and retrievals, even with a large number of keys.

Some advantages of using mappings over arrays in Solidity include:
1) Fast lookups: Since mappings are implemented as hash tables, retrieving a value based on its key is very fast and efficient, even for a large number of key-value pairs.
2) Dynamic sizing: Unlike arrays in Solidity, mappings do not have a fixed size and can grow or shrink dynamically as key-value pairs are added or removed.
3) Lower gas cost: In some cases, using mappings instead of arrays can result in lower gas costs for operations that involve searching or updating values.

VII. CONCLUSION

The use of blockchain technology in crowdfunding presents a promising solution for increasing transparency, accountability, and security in fundraising and investment. This paper proposed a crowdfunding website that utilizes blockchain technology to allow NGOs to seek funding and startups to raise investments. The platform allows investors to receive shares and voting rights in startups and NGOs in exchange for their investments and funding. Furthermore, the platform ensures that the use of funds and investments is subject to democratic voting, where a majority vote of 51% is required to authorize any spending. The proposed crowdfunding website can potentially revolutionize the traditional crowdfunding model by enabling greater trust, transparency, and efficiency in the fundraising and investment process. However, further research is needed to investigate the scalability and practicality of such a platform, as well as the potential regulatory challenges that may arise in implementing this model.

VIII. FUTURE SCOPE

The work will be to enhance our platform by incorporating a chat box feature that will facilitate effective communication between investors and project managers. Additionally, will introduce two new dashboards - Admin dashboard and Project Manager dashboard - to provide personalized project and investment updates to each user. The admin dashboard will offer a comprehensive view of all ongoing projects and investments, enabling administrators to manage and monitor them efficiently. The Project Manager dashboard, on the other hand, will provide project managers with detailed insights and updates on their respective projects and investments. With these new features, we aim to enhance the user experience on our platform and enable seamless communication and collaboration between investors and project managers.

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