# Decentralized Web3 Blockchain Crowdfunding Platform

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*Abstract*—This project dives into the development of a decentralized crowdfunding platform leveraging Web3 technology and blockchain integration. It is powered by the Ethereum blockchain to run smart contracts, aiming to automate integrity in the fundraising process and enhance transparency among users while reducing fraud risks. Through cryptocurrency wallets, the platform enables direct contributions without intermediaries, thereby increasing trust and efficiency. Utilizing smart contracts ensures secure, transparent transactions that build a trustworthy environment for investors and fundraisers. This innovation makes the platform a pioneering, futuristic solution in the crowdfunding space, embracing a new standard of transparency and security.

*Index Terms*—Decentralized Crowdfunding, Web3 Technology, Blockchain Integration, Ethereum Smart Contracts, Transparent Transactions, Digital Ledger, Tokenized Funding, Smart Contract Automation, Blockchain Security, Decentralized Application (dApp).

## I. INTRODUCTION

Crowdfunding has emerged as a transformative tool for raising capital, enabling individuals, startups, and organizations to finance their ideas, projects, and ventures through collective contributions from many people via online platforms. This decentralized approach to fundraising has democratized access to capital and fostered innovation across industries. However, despite its growth and success. crowdfunding platforms face a critical challenge: the misuse and mismanagement of funds by campaign managers. Once funds are collected, there is often little to no oversight on how they are spent, creating opportunities for fraud and misallocation of resources. This lack of transparency and accountability not only undermines trust but also deters potential backers from participating, ultimately threatening the sustainability of crowdfunding as a viable funding mechanism.

Blockchain technology presents a promising solution to address this issue. Its decentralized, immutable, and

transparent nature makes it an ideal candidate for enhancing the security and trustworthiness of crowdfunding platforms. By integrating blockchain into crowdfunding, it becomes possible to implement a system where transactions are not only transparent but also subject to decentralized approval mechanisms. This ensures that funds can only be released and utilized for their designated purpose with the consent of a predefined number of investors or backers, thus preventing unauthorized use of resources.

This research paper proposes a blockchain-based crowdfunding platform that secures transactions through decentralized, investor-approved spending mechanisms. Our solution seeks to restore trust in crowdfunding by providing a transparent, tamperproof system that prevents fraud and ensures funds are used by the original project goals. Unlike existing models that offer limited blockchain integration, our approach focuses on enforcing decentralized governance over fund disbursement, creating a secure and trustworthy environment for both investors and project creators. This paper will explore the technical architecture, implementation challenges, and potential impact of this platform on the crowdfunding ecosystem.

## II. RELATED WORK

Now in this related work part, we will discuss some work that has been done in this field.

Blockchain technology has garnered significant attention for its potential to revolutionize crowdfunding platforms by addressing several critical issues, such as fraud, transparency, trust, and operational inefficiencies. Several studies have highlighted blockchain's ability to create decentralized transaction systems that not only enhance security but also automate fund management through the use of smart contracts, ensuring that contributors have control over fund allocation and spending. For example, one study proposes using Ethereum to manage secure fund transfers, where contributor approval is required for expenditures, thus preventing misuse and promoting transparency [1]. Another study explores blockchain's role in promoting financial inclusion by offering decentralized platforms that are more accessible to underserved populations, reducing reliance on financial intermediaries and lowering transaction costs, making crowdfunding more inclusive [2]. Additionally, blockchain's ability to ensure transparent fund allocation in donation-based crowdfunding has been examined, with a focus on how it helps to foster trust and confidence among donors by preventing the misuse of funds and ensuring that the funds are used as intended [3]. Other research has focused on the broader impact of blockchain on crowdfunding platforms, exploring its potential to enhance security, reduce operational costs, and prevent fraud through smart contract mechanisms that automatically enforce predefined terms and conditions, ensuring that funds are only released when specific criteria are met [4][5][6][7]. The technical applications of Ethereum and smart contracts have also been extensively studied, with frameworks proposed that enhance accountability by ensuring that funds are disbursed only when predefined conditions, such as reaching a funding goal or completing a project milestone, are met [8][9]. These developments highlight the growing consensus that blockchain's decentralized structure, combined with its smart contract capabilities, can significantly improve the transparency, security, and efficiency of crowdfunding systems, making them a much more reliable alternative to traditional methods [10][11][12]. Moreover, blockchain's scalability, along with its ability to create self-sustaining decentralized organizations, has been recognized as a major advantage, enabling the development of crowdfunding platforms that operate without the need for centralized authority or intermediaries [13][14][15]. Blockchain's integration into crowdfunding also promises to streamline operations by eliminating intermediaries, reducing transaction fees, and enabling global participation. This allows for a more inclusive platform where contributors from any part of the world can support campaigns, overcoming barriers typically found in traditional banking systems. Additionally, blockchain's decentralized nature allows for greater autonomy and decision-making within the platform. Decentralized autonomous organizations (DAOs) can be used to govern crowdfunding platforms, ensuring that decisions are made transparently and in the collective interest of stakeholders [16][17]. Furthermore, by providing immutable, tamper-proof records, blockchain guarantees that all transactions are securely logged, reducing the risk of fraud and increasing accountability, which are key concerns for both campaign creators and donors [18][19]. Ultimately, blockchain's integration into crowdfunding platforms offers a transformative solution by eliminating intermediaries, reducing fraud, enhancing transparency, and building trust among users, all while creating systems that are secure, efficient, and capable of scaling to meet global demands for crowdfunding across various sectors [20].

### **III. PROBLEM STATEMENT**

Traditional crowdfunding platforms, while empowering creators and allowing individuals to contribute to projects they believe in, face serious challenges in maintaining transparency, security, and control over funds. Once contributions are made, donors often have limited visibility into how their funds are used, leaving them reliant on the honesty of the project managers. Project creators, in turn, hold sole control over the raised capital, which opens the door to misuse or even fraud. This lack of oversight has contributed to growing concerns about the potential for mismanagement of funds. Additionally, the absence of robust verification processes for project managers exacerbates the issue, as unverified or dishonest individuals can easily exploit the system. The inability of traditional platforms to provide tamper-proof transaction records further weakens trust between contributors and campaign creators, leading to reduced confidence and reluctance to invest, particularly in larger or riskier projects.

Our project seeks to solve these issues by developing a blockchain-based crowdfunding platform built on Ethereum and smart contracts. This platform will revolutionize the way crowdfunding campaigns are managed by ensuring secure, decentralized transactions and automating fund disbursements based on pre-established conditions. Through the use of

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smart contracts, funds will only be released when specific milestones are met, allowing contributors to retain control over their contributions and ensuring that projects are held accountable to their goals. Furthermore, by using blockchain's immutable ledger, all transactions will be recorded transparently and permanently, offering an additional layer of accountability. The platform will also implement a rigorous verification process for campaign creators, reducing the likelihood of fraudulent campaigns. By combining these features, the blockchain-based solution will significantly enhance trust and security, providing a more reliable, transparent, and userfriendly alternative to traditional crowdfunding platforms.

#### IV. PROPOSED METHODOLOGY

The proposed methodology aims to significantly enhance the security, transparency, and accountability of crowdfunding platforms by implementing a decentralized transaction system built on Ethereum and smart contracts. In this system, funds contributed by investors are held in secure, Ethereum-based smart contracts, which only release the money once specific predefined conditions are met. These conditions could be tied to project milestones, deadlines, or approval from a certain number of contributors. By embedding these rules into smart contracts, the platform ensures that project managers cannot access or misuse funds without fulfilling their commitments. This automation eliminates the need for intermediaries and reduces the risk of tampering, as all transactions are recorded on the blockchain, making them immutable and fully system not only auditable. This improves accountability but also fosters trust between project creators and investors, as it guarantees that funds will only be used for their intended purpose.

The platform's security is further bolstered by a multilayered approach. A rigorous verification process for campaign creators will be implemented to ensure that only legitimate individuals or organizations can launch campaigns. This verification, combined with the immutable nature of the blockchain, will safeguard the integrity of transactions and reduce the risk of fraudulent campaigns. Additionally, multi-factor authentication (MFA) and end-to-end encryption will protect user accounts and sensitive data, ensuring that only authorized individuals can access funds and campaign management tools. Campaigns will benefit from real-time updates and dynamic deadlines, which will allow for greater flexibility in managing project timelines. Contributors will be able to track the progress of projects in real time, adding a layer of transparency.

To enhance user experience and attract a global audience, the platform will also include sector-specific filters, making it easier for investors to find projects that align with their interests or ethical values. This feature will allow users to filter campaigns by industry, project type, or social impact, ensuring that contributors can support causes they care about. In addition, the platform will be designed to accommodate multiple currencies and languages, ensuring accessibility for international investors and startups. By supporting different fiat currencies and cryptocurrencies, the platform can reduce barriers to entry for global users. Overall, this comprehensive approach addresses many of the limitations found in traditional crowdfunding platforms by offering a more secure, transparent, and inclusive alternative, thereby fostering an ecosystem of trust and accountability for both contributors and project creators.



Fig. 1. Proposed Flow Graph

## V.IMPLEMENTATION OF CORE PLATFORM COMPONENTS

#### 1. Fundraiser

A fundraiser is an individual or entity that seeks to raise capital for a specific project or cause through a decentralized platform. In a blockchain-based crowdfunding platform, the fundraiser posts the campaign details, including the required funds, goals, and deadlines. By leveraging blockchain's transparency and security, the fundraiser benefits from a trustless environment where they can access a global network of funders without intermediaries.

The role of the fundraiser in this system is crucial as they initiate the smart contract-based campaign, defining the terms and conditions for the fund collection, such as the minimum/maximum contributions and project timelines. Once the goal is reached and validated by the system, the fundraiser receives the collected amount, ensuring transparency and accountability.

### 2. Service Provider Platform

The service provider platform acts as an interface between the fundraiser and the blockchain platform. It allows the fundraiser to post campaign details and helps the funders discover campaigns of interest. The platform ensures the smooth flow of data between participants, handling interactions such as campaign creation, contribution management, and transaction tracking.

In a blockchain environment, the service provider platform facilitates interaction with smart contracts written in Solidity, managing the user interface and user experience while ensuring that all interactions with the blockchain are seamless. The platform typically includes features such as user registration, campaign listing, and access to wallets for funders and fundraisers.

## 3. Blockchain Platform

The blockchain platform is the core infrastructure that supports decentralized operations. It ensures that all transactions are recorded immutably, providing security, transparency, and decentralized governance. Within this platform, smart contracts automate the execution of agreements between parties, reducing the need for intermediaries and manual verification.

In a crowdfunding scenario, the blockchain platform verifies contributions, ensures that funds are only released when predefined conditions are met, and securely stores the entire history of transactions across multiple blocks. This enables a decentralized, trustless environment where the rules are enforced by the system rather than by central authorities.

## 4. Smart Contracts

Smart contracts are programmable agreements that automatically execute once the conditions encoded within them are fulfilled. In a blockchain platform, smart contracts eliminate the need for intermediaries by automating processes such as fund collection, verification, and disbursement.

Written in Solidity, these contracts define the rules of a crowdfunding campaign, including the target funding amount, contribution limits, and deadlines. Once deployed on the blockchain, smart contracts are immutable, ensuring that the terms cannot be altered, thereby providing funders with confidence that the rules will be enforced as written.

## 5. Solidity

Solidity is the programming language specifically designed for writing smart contracts on the Ethereum blockchain. As a statically typed language with a syntax similar to JavaScript, Solidity allows developers to encode business logic directly into the blockchain. In a crowdfunding platform, Solidity is used to define the rules of engagement, such as fund goals, deadlines, and contribution limits.

The decentralized nature of blockchain platforms requires a reliable and secure language like Solidity to ensure that transactions are carried out accurately and efficiently. By encoding the fundraising campaign logic into the smart contract, the platform guarantees automation and transparency in every transaction.

## 6. Authorization

Authorization within a blockchain platform refers to the process by which the system verifies and grants permission for a transaction or action to be performed. In the context of a crowdfunding platform, authorization ensures that only verified funders can contribute and that the fundraiser receives funds only when the specified conditions (such as achieving the funding goal) are met.

The blockchain platform handles authorization automatically through cryptographic techniques, ensuring that all transactions are valid, legitimate, and secure. By using smart contracts, the platform can enforce these permissions without the need for a centralized authority.

## 7. Information Storage (Blocks)

The information storage component of a blockchain is distributed across multiple blocks (e.g., Block-1, Block-2, Block-3). Each block contains a batch of transactions or data, securely hashed to maintain the integrity of the system. In a crowdfunding platform, each contribution or transaction is stored in a block, ensuring that the entire process is transparent and auditable.

Each block is linked to the one preceding it, forming a chain of immutable records. The decentralized storage of information ensures that no single party can manipulate the data, providing a high level of security and trust in the platform. This structure is critical for maintaining the accuracy and transparency of campaign contributions, as all funders and fundraisers can verify the stored information.

## 8. View & Verify Transactions

The view and verify transactions functionality allow both funders and the platform to check the status of contributions in real time. Blockchain's transparency enables anyone to inspect the ledger to verify the authenticity of transactions, ensuring that no tampering or fraudulent activity occurs.

This ability is a crucial feature of blockchain, as it allows funders to ensure their contributions are accurately recorded, while fundraisers can track how much funding they have received. By enabling public verification, blockchain builds trust between all parties in the crowdfunding process.

## 9. Funder

The funder is an individual or entity that contributes to a project listed by a fundraiser on the platform. Funders provide the necessary financial support through the blockchain platform by interacting with smart contracts. Each contribution is securely recorded in the blockchain, ensuring that funders can verify the status of their investment at any time.

Funders benefit from the transparency and security provided by the platform, as their funds are only

released when the campaign's goals are met. In the case of unsuccessful campaigns, the smart contract can automatically trigger a refund to the funder, safeguarding their investment.

## 10. Fund Release Mechanism

The fund release mechanism is the process by which the funds collected through the campaign are transferred to the fundraiser, but only when the predefined conditions are met. This mechanism is governed by the rules encoded in the smart contract, which ensures that fund release happens only after the successful completion of the campaign.

Once the platform verifies that the funding goal has been met and the campaign is successful, the smart contract automatically releases the funds to the fundraiser's wallet. This automation removes the need for third-party intermediaries, ensuring a seamless and trustless transaction.

## Conclusion

This blockchain-based platform, enabled by smart contracts written in Solidity, provides a secure and transparent environment for crowdfunding. Each element, from transaction verification to fund release, is governed by decentralized protocols, ensuring that every process is automated and immutable, building trust between funders and fundraisers.

## VI. ALGORITHM IMPLEMENTATION

The algorithm implemented for the blockchain-based crowdfunding platform leverages the power of smart contracts. Ensures the integrity, transparency, and automation of transactions between fundraisers and funders. The following subsections outline the core components and how the algorithm functions in the platform.

## 1. Smart Contract Initialization

The initial step in the algorithm involves defining the parameters of the fundraising campaign through the creation of a smart contract. These contracts are designed to automate the entire process by enforcing specific rules, such as the fundraising goal, deadlines, and contribution limits. Once deployed, these contracts are immutable, meaning that no party can alter the terms of the agreement, ensuring security and trust in the system.

The smart contract defines the campaign structure, including:

- The total funding required (goal).
- A fixed deadline for reaching the target.
- A mechanism to track each funder's contributions.

This initialization phase ensures that the platform has a clear set of rules and conditions, which are publicly verifiable on the blockchain.

### 2. Funder Contribution Process

Once the contract is initialized, the algorithm enables potential funders to participate by contributing cryptocurrency to the campaign. Each contribution is tracked within the system, and the transaction is recorded in the blockchain ledger for transparency and future verification. The algorithm checks multiple conditions, such as the contribution being made before the deadline and within allowed limits.

By leveraging blockchain technology, the system ensures that all contributions are securely stored across multiple blocks. This guarantees that the fundraising process is tamper-proof and that funders have a transparent view of how much has been raised and from whom.

#### 3. Verification and Authorization

For each contribution, the blockchain platform executes a set of verification steps to ensure the legitimacy of the transaction. The algorithm checks that the campaign's deadline has not passed, verifies the contribution amount, and ensures the transaction adheres to the terms set in the smart contract.

Once verified, the blockchain records the transaction in its immutable ledger. The automatic nature of the smart contract allows for continuous monitoring and updating of the fundraiser's progress without human intervention. This enhances the platform's reliability and minimizes the possibility of fraudulent activities.

## 4. Fund Release Mechanism

The algorithm includes a mechanism to release funds to the fundraiser once the conditions outlined in the smart contract are met. Specifically, when the target amount is raised before the deadline, the contract automatically triggers the transfer of funds from the campaign's balance to the fundraiser's wallet.

This process ensures that all actions are completed transparently and according to predefined rules. If the fundraiser meets the goal, they will receive the funds without needing to take any additional steps. Conversely, if the conditions are not met, no funds are released, and the system remains secure from potential exploitation.

### 5. Refund Process

In cases where the fundraising campaign does not reach its goal within the specified timeframe, the algorithm includes a refund mechanism. This process allows funders to reclaim their contributions without the need for manual intervention. The smart contract automatically determines the eligibility of each funder for a refund and facilitates the return of their contributions based on the original conditions.

The inclusion of this automatic refund process adds an extra layer of security for funders, ensuring they are not at risk of losing their contributions if a campaign fails.

#### 6. Storage and State Management

The algorithm efficiently manages the storage of all relevant data within the blockchain platform. Each transaction, whether it's a contribution or a refund, is stored immutably in the blockchain. By using decentralized storage mechanisms, the algorithm ensures that all interactions are securely recorded across a distributed network of nodes.

This decentralized storage approach guarantees that the system is resistant to tampering, and participants can trust the integrity of the information stored. The blockchain structure allows funders and fundraisers to have complete transparency over the campaign's progress and outcome, making it a highly secure and reliable platform for crowdfunding.

Conclusion The implementation of a blockchainpowered crowdfunding platform leverages modern cryptographic methods and decentralized storage to streamline the fundraising process. By utilizing smart contracts, the platform can establish rules, validate transactions, and securely manage the transfer of funds or refunds. This system ensures transparency, reliability, and trust due to the immutability and security inherent in blockchain technology.

## VII. RESULTS

This decentralized crowdfunding platform simplifies the process of launching new projects. Users can input details such as the project title, description, and minimum donation with just a few clicks. This study aimed to explore blockchain technology's potential and its influence on developing applications based on distributed architectures. Additionally, it addressed the inefficiencies of conventional crowdfunding platforms in raising funds. The proposed solution not only minimizes the high fees associated with traditional platforms but also enhances user interaction, allowing for lower-cost contributions to any chosen campaign.

#### VIII. FUTURE WORK

this decentralized Future enhancements for crowdfunding platform could include features that enable completely anonymous investments while ensuring that the intended charity receives the entire contribution without delays. Donations could be directed to user-controlled cryptocurrency wallets, ensuring security and ownership. A membership feature could be introduced, allowing charities to develop subscription-based models where users pay a monthly fee to access the platform's community. Transaction fees could also apply, fostering a deeper connection between donors and the causes they support. Additional functionalities could enable listing, tokenization, and fractional ownership of projects based on patents, digital assets, and other intellectual property, enriching the decentralized ecosystem.

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