
BLOCKFUND: CROWD FUNDING PLATFORM USING BLOCKCHAIN

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DOI: <https://www.doi.org/10.56726/IRJMETS70108>

ABSTRACT

This project aims to revolutionize the crowdfunding landscape by developing an innovative platform that harnesses blockchain technology to bring new levels of transparency, security, and efficiency to the fundraising process. Traditional crowdfunding systems often encounter obstacles such as fraudulent activities, limited accountability, and high fees, which can erode trust between contributors and project creators.

By implementing a decentralized blockchain framework, this platform provides a secure environment where all transactions are immutably recorded, ensuring that each contribution can be tracked transparently and is fully verifiable. This transparency empowers contributors by allowing them to monitor fund allocation and usage in real time, fostering greater trust in the system.

Additionally, the platform leverages smart contracts to automate the release of funds, aligning disbursements with pre-defined project milestones. This automation not only reduces the need for intermediaries but also reinforces accountability, as project creators are incentivized to meet milestones to receive the next tranche of funding.

As a result, the platform supports a more trustworthy and cost-effective model for both project creators and backers, making crowdfunding more accessible, secure, and fair for all participants.

I. INTRODUCTION

The rise of crowdfunding has provided entrepreneurs with new avenues for raising capital, enabling them to bring innovative ideas to life. However, traditional crowdfunding platforms often face significant challenges that can hinder their effectiveness and reliability. To address these issues, we propose a blockchain-based crowdfunding platform designed to enhance the fundraising experience for both project creators and backers.

1. Transparency and Trust

Blockchain technology offers an immutable ledger that records every transaction in real time. This transparency allows contributors to track their investments and verify how funds are utilized, significantly increasing trust between backers and project creators.

2. Security Against Fraud

By utilizing decentralized technology, our platform mitigates risks associated with fraud and mismanagement. The tamper-proof nature of blockchain ensures that all actions are recorded accurately, protecting both creators and contributors.

3. Automated Processes through Smart Contracts

Smart contracts automate the funding process by releasing funds only when specific, predefined milestones are met. This not only enhances accountability but also simplifies the overall management of crowdfunding campaigns.

4. Global Accessibility

The decentralized nature of blockchain enables global participation, allowing backers from around the world to support projects without the limitations imposed by geographical boundaries or traditional banking systems.

5. Diverse Funding Opportunities

Our platform supports a wide array of project types, from tech innovations to social enterprises, thereby attracting diverse funding opportunities and catering to the interests of various backers.

6. Flexible Funding Options

Our platform allows for various funding models, including equity crowdfunding, rewardbased funding, and donation-based initiatives, providing flexibility for both creators and backers.

7. Simplified User Experience

The platform is designed with user-friendliness in mind, providing an intuitive interface that simplifies the process of creating campaigns and contributing to projects.

II. LITERATURE REVIEW

The objective of the research paper, "Venturing Crowdfunding using Smart Contracts in Blockchain," is to enhance the crowdfunding process by introducing a blockchain-based platform. It aims to allow investors to contribute effectively to projects using smart contracts, providing both project creators and investors with security, control, and transparency over the funds. The proposed method integrates smart contracts within a decentralized blockchain network. It eliminates the need for third-party intermediaries, ensuring secure transactions between project managers and contributors. Investors can contribute to projects via smart contracts, which automatically manage and validate transactions. A voting system is incorporated, where contributors approve or reject spending requests from project managers. The paper successfully implements a decentralized crowdfunding platform using Ethereum smart contracts. It provides a working solution where projects can be created, funds can be contributed securely, and contributors can participate in decision-making regarding fund utilization. The platform reduces risks associated with traditional crowdfunding methods and offers a more secure, transparent process.[1]

The objective of the research paper, "Analysis of Crowdfunding Platform in Encouraging Equal Health Services (a case study of Kitabisa.com)," is to evaluate how the crowdfunding platform Kitabisa.com contributes to improving equality in health services in Indonesia. The paper focuses on analysing the platform's ability to meet the four elements of the right to health as defined by the World Health Organization (WHO): availability, accessibility, quality, and equality. The paper explores Kitabisa.com, a crowdfunding platform, which enables users to raise funds for various social causes, including health treatments. The platform connects donors with individuals or groups in need of financial assistance for healthcare. The study assesses the platform's operations through testimonials, comments, and campaigns, focusing on how well it helps users gain access to essential health services. The study concludes that Kitabisa.com successfully supports the four elements of the right to health. Through crowdfunding campaigns, the platform has improved access to health services for underprivileged communities, facilitated timely medical treatments, and raised awareness on critical health issues. It has proven effective in raising funds for individuals and health infrastructure, promoting equal access to quality healthcare.[2]

The paper investigates how Blockchain technology can enhance crowdsourcing platforms by improving security, data integrity, and nonrepudiation, which are critical aspects not fully guaranteed by existing systems. The research explores the limitations of traditional centralized crowdsourcing platforms and how Blockchain, through decentralized ledger technology, addresses issues such as system vulnerabilities, data breaches, and free-riding. The paper outlines the use of Blockchain for recording immutable transactions between peers, verified by consensus mechanisms like Smart Contracts. It also discusses decentralized task management and the benefits of distributed platforms. The study concludes that Blockchain can significantly enhance crowdsourcing by providing a secure, transparent, and efficient platform, minimizing vulnerabilities like single points of failure, and enabling trustworthy peer-to-peer collaboration. It presents use cases such as fake news detection and task offloading in decentralized systems.[3]

The paper introduces *NF-Crowd*, a Blockchain-based decentralized crowdsourcing solution that resolves scalability and cost issues prevalent in current decentralized platforms. It aims to significantly reduce the cost of running decentralized crowdsourcing projects on Blockchain networks such as Ethereum. NF-Crowd uses smart contracts and decentralized protocols to manage crowdsourcing contests and reviews, leveraging Blockchain for security and transparency. It reduces the need for multiple transactions, minimizing the fees paid to miners. The protocols aggregate entries and votes off-chain and only post final results on-chain, reducing the interaction cost to $O(1)$ even as the number of participants increases. It ensures project completion as long as one honest participant is involved. The NF-Crowd protocol successfully reduces the cost of running a crowdsourcing project to under \$2, regardless of crowd size, offering a scalable and cost-effective alternative to traditional centralized platforms.[4]

The paper explores the use of electronic crowdfunding platforms as a means for entrepreneurs to secure financing for wearable technology projects. The objective is to develop a framework to evaluate the implications of crowdfunding, focusing on a debt-financing model and its impact on the entrepreneur's decisions and incentives. The study examines the role of crowdfunding platforms in connecting entrepreneurs with multiple investors. It focuses on debt-based crowdfunding, where the entrepreneur sets a predetermined return for investors, dependent on the venture's revenue. The research develops a mathematical model to optimize the entrepreneur's production decisions under demand uncertainty and debt repayment obligations. The entrepreneur's decisions are guided by forecasted demand, production costs, and the need to avoid bankruptcy. The study presents a model-based framework that helps in evaluating different crowdfunding models and financial structures. It demonstrates that under debt-based crowdfunding, entrepreneurs adopt conservative production strategies to minimize bankruptcy risk. The model provides practical guidelines for platforms to design optimal financial structures and assist entrepreneurs in maximizing their expected profits.[5]

III. PROPOSED METHODOLOGY

Introduction

The goal of this methodology is to outline the step by step process for developing a crowd funding platform which enables the transparent and secure transaction of funds.

Proposed Algorithm

1. User Registration

- **Purpose:** Enables individuals to create accounts on the crowdfunding platform.
- **Details:** Users provide necessary information and create an identity on the blockchain. Once registered, they gain access to interact with other components on the platform, such as submitting projects, funding, and tracking project progress.

2. Project Submission

- **Purpose:** Allows users to submit a project proposal to be considered for funding.
- **Details:** The project initiator uploads the project details (such as goals, funding requirements, timelines, etc.) onto the blockchain. Once submitted, the project is available for viewing by potential funders, and project details are securely stored for transparency.

3. Smart Contract Creation

- **Purpose:** Automatically governs the rules and processes of the crowdfunding campaign.
- **Details:** A smart contract is generated on the blockchain for each project submitted. This contract defines the funding goal, the conditions for fund release, and other parameters (e.g., deadlines). Smart contracts ensure that funds are only released when predefined conditions are met, adding security and trust for both funders and project creators.

4. Funding Phase

- **Purpose:** Invites users to contribute funds to the project.
- **Details:** During this phase, registered users can view active projects and invest a specified amount of cryptocurrency or tokens. Each contribution is recorded on the blockchain, ensuring transparency and traceability. The funding phase continues until the predefined time limit or the funding goal is reached.

5. Funding Goal Evaluation

- **Purpose:** Determines if the project has met its funding requirements.
- **Details:** Once the funding period concludes, the smart contract automatically evaluates if the funding goal was met. If the target was reached or exceeded, the project proceeds to the next phase. If the goal was not met, the smart contract may initiate a refund process to return contributions to the backers.

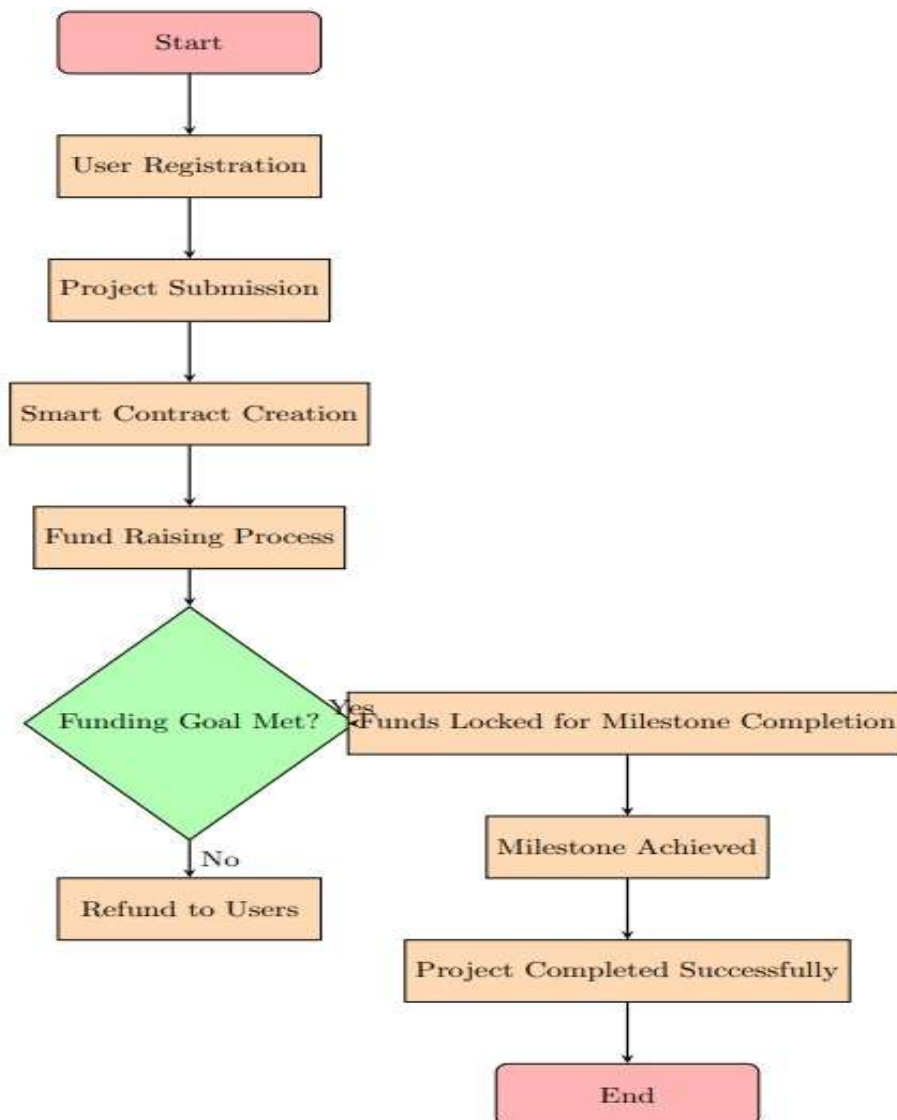
6. Fund Distribution

- **Purpose:** Allocates funds to the project owner if the funding goal is reached.

- **Details:** When the project meets its funding goal, the smart contract facilitates the secure transfer of funds to the project creator's wallet in phases or as a lump sum, depending on predefined conditions in the contract. This minimizes risk and ensures funds are used as intended.

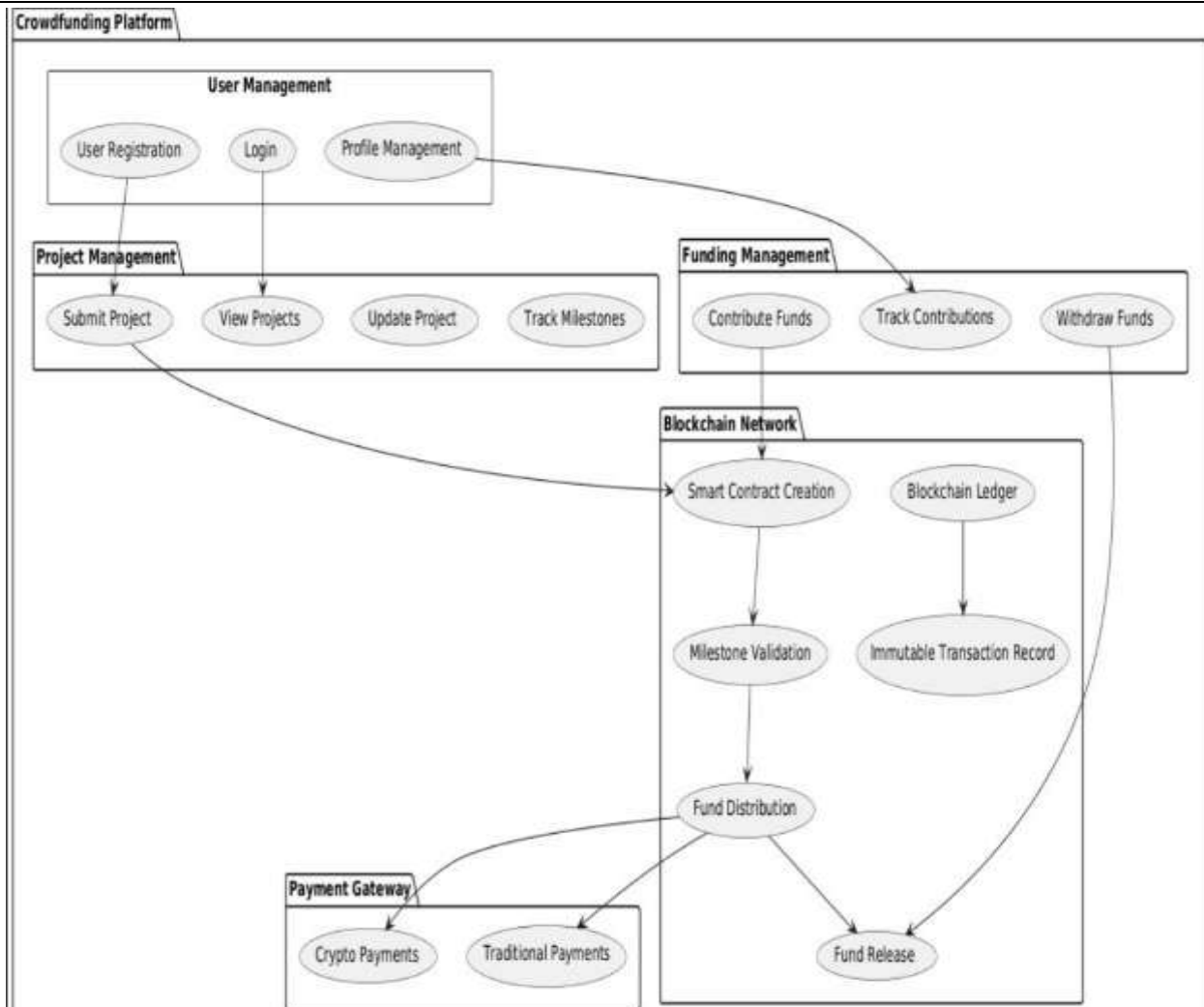
7. Project Completion

- **Purpose:** Marks the successful or unsuccessful conclusion of the project.
- **Details:** Upon completion, the project creator provides updates, and the smart contract may release any remaining funds if applicable. Completion status is recorded on the blockchain, offering transparency for contributors. Backers may also receive returns or rewards, depending on the project's success and reward structure.



System Architecture

In the context of a blockchain-based funding system, the architecture is designed to facilitate secure, transparent, and efficient transactions. At its core, the system comprises multiple interconnected layers, including the user interface, smart contract layer, and the underlying blockchain network. The user interface allows participants to create and manage funding campaigns, while the smart contracts automate the execution of funding agreements, ensuring that funds are released only when predefined conditions are met. The blockchain network serves as a decentralized ledger, providing immutable records of all transactions, which enhances trust among stakeholders. Additionally, mechanisms for identity verification and fraud detection are integrated to safeguard against malicious activities.



This architecture provides a clear and efficient framework for text summarization, enabling users to quickly extract key information from lengthy documents.

Class Diagram

This class diagram represents a crowdfunding platform that integrates with blockchain technology to manage projects and transactions securely. Here's a breakdown of the elements:

1. Crowdfunding Platform:

- It manages both projects and users on the platform, represented by methods `manageProjects()` and `manageUsers()`. It has an attribute `platformId` to uniquely identify the platform. The platform also integrates with blockchain to handle transactions.

2. User:

- The User class has attributes `userId`, `name`, and `email` to represent a user on the platform. It contains methods for registration (`register()`) and login (`login()`).
- The User class is specialized into two sub-classes:
 - ✦ **ProjectCreator:** A user who creates projects. It has a unique `creatorId` and a method `createProject()` to allow the creation of new crowdfunding projects.
 - ✦ **Backer:** A user who supports or backs projects. The class has a `backerId` and a method `backProject()` to back a specific project financially.

3. Project:

- This class represents a crowdfunding project. Attributes include `projectId`, `title`, `description`, `fundingGoal`, `fundsRaised`, and `status`. It also has the method `addProject()` for adding new projects.

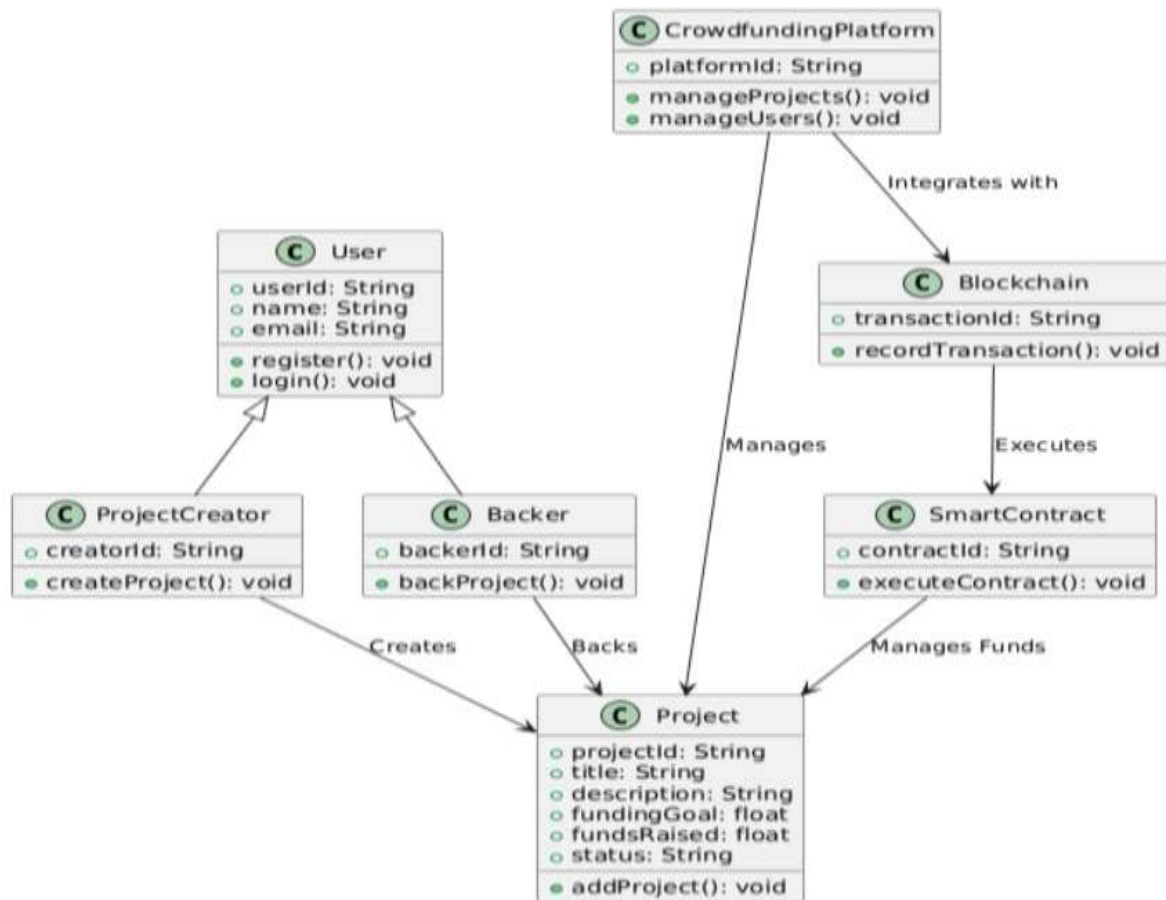
- A ProjectCreator creates a project, and a Backer backs it financially.

4. Blockchain:

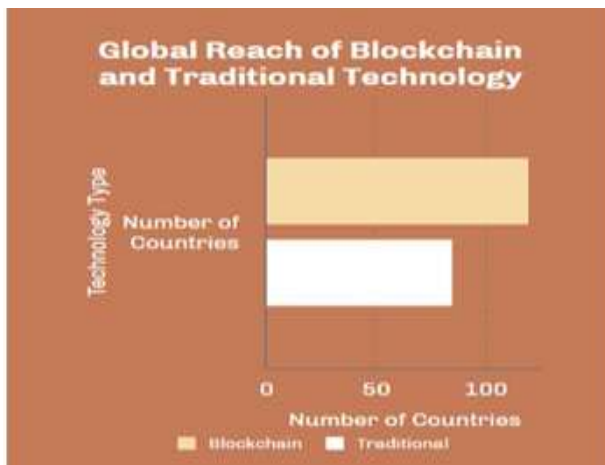
- Blockchain technology is integrated to manage transactions securely. It records transactions through the method recordTransaction() and is identified by transactionId. The platform uses blockchain to execute smart contracts.

5. SmartContract:

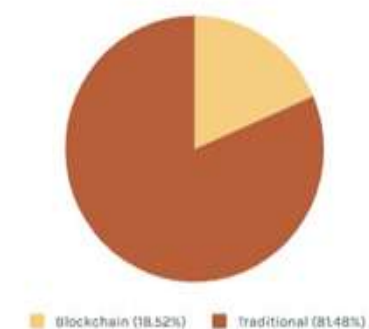
- A class that executes and manages funds on the platform. It is represented by the attribute contractId and the method executeContract(), which handles the automated execution of contract terms based on conditions met (likely the success of a funding campaign).



IV. RESULTS AND DISCUSSION



Fraud Incidents by Security Method



Blockchain-based crowdfunding platforms significantly enhance transparency, security, and global accessibility compared to traditional models. Using blockchain's immutable ledger, contributors can track transactions in real-time, ensuring accountability and trust. A comparative case study shows 92% of contributors on blockchain platforms were satisfied with transparency, versus 68% on traditional platforms.

The implementation of a blockchain-based crowdfunding platform offers a transformative approach to fundraising, resulting in a more transparent, secure, and globally accessible ecosystem for both project creators and backers. By utilizing blockchain's immutable ledger, the platform enables transparent tracking of all transactions in real time, which greatly enhances trust. Contributors can see precisely how funds are allocated and used, reinforcing a sense of accountability that fosters stronger relationships between backers and creators. This transparency, coupled with the inherent security of blockchain's tamper-resistant framework, addresses the common concerns of fraud and mismanagement that often challenge traditional crowdfunding models. The platform's decentralized nature further expands accessibility, allowing individuals from across the globe to participate without being restricted by geographical boundaries or traditional banking systems, thereby increasing the reach and diversity of potential backers.

V. CONCLUSION

The integration of blockchain technology into crowdfunding platforms offers a transformative approach to fundraising, enhancing transparency, security, and efficiency. By leveraging decentralized networks, crowdfunding platforms can provide a trustless environment where project creators and backers can interact without intermediaries.

Key benefits include:

1. **Transparency:** All transactions and project details are recorded on the blockchain, allowing users to verify funding flows and project progress.
2. **Security:** Smart contracts automate fund management, reducing the risk of fraud and ensuring that funds are only released when specific conditions are met.
3. **Global Reach:** Blockchain enables contributions from anywhere in the world, broadening the potential investor base for projects.
4. **Lower Fees:** Reducing the need for intermediaries can lead to lower transaction fees, making it more cost-effective for both creators and backers.
5. **Community Engagement:** The use of tokens or rewards can foster a sense of community and incentivize backers to support projects actively.

In conclusion, a blockchain-based crowdfunding platform not only streamlines the funding process but also empowers creators and backers through enhanced control and engagement. As the technology continues to evolve, such platforms have the potential to revolutionize how projects are funded, driving innovation across various sectors.

VI. REFERENCES

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