

Crowd-Funding using Blockchain

Prof. Sonali Dongare, Vishwajeet Bamane, Abhishek More, Prasad Chopade, Saurabh Aherwadkar, Nitin Dhawas

Information Technology, Nutan Maharashtra Institute of Engineering and Technology Talegaon Dabhade, India

ARTICLE INFO

Article History :

Accepted: 10 Nov 2023

Published: 30 Nov 2023

Publication Issue :

Volume 10, Issue 6

November-December-2023

Page Number :

223-228

ABSTRACT

This review paper explores the transformative potential of blockchain-based crowdfunding, addressing the vulnerabilities of traditional platforms, including data breaches and high fees. Analyzing three research papers focused on Ethereum-based donation transactions, the study emphasizes the strengths and limitations of these platforms. While blockchain introduces transparency, trust, and security, challenges such as technical complexity, volatility, and scalability persist. Smart contracts and digital identity management emerge as key methodologies to enhance privacy and decentralization. The paper highlights the global accessibility, reduced intermediaries, and immutable transactions afforded by blockchain. Despite challenges, this synthesis underscores blockchain's role in revolutionizing crowdfunding, offering insights for future research and practical applications.

Keywords : Ethereum, synthesis

I. INTRODUCTION

Crowdfunding has emerged as a pivotal means of raising funds globally, gaining heightened significance, especially in the wake of the COVID-19 pandemic. This review delves into the innovative realm of blockchain-based crowdfunding, delineating its potential to mitigate vulnerabilities inherent in traditional platforms, such as susceptibility to data breaches, high transaction fees, and fraud. Focusing on Ethereum as a primary blockchain platform, the exploration encompasses donation-based transactions facilitated through the implementation of smart contracts using the Solidity language. The research

critically examines the landscape of user financial platforms, elucidating the nuances of blockchain technology. Notably, the study underscores the imperative role of digital identity management in augmenting the security and privacy of crowdfunding transactions. Against this backdrop, the paper aims to provide a comprehensive review of existing literature, offering insights into the strengths, limitations, and user perceptions surrounding blockchain-based crowdfunding. The research also proposes a blockchain-centric crowdfunding network designed to confer privacy, security, and decentralization, emphasizing the transformative potential of

Ethereum's smart contracts in reshaping the crowdfunding paradigm.

A. Evolution of Crowdfunding

The widespread adoption of crowdfunding as a quick and efficient fundraising method has become particularly pronounced amid the Covid pandemic. Platforms like Kickstarter.com, Indiegogo.com, and Mystartr.com exemplify the diverse range of campaigns, from individual medical assistance to large-scale funds. The speed and efficiency of crowdfunding in mobilizing funds swiftly set the stage for exploring novel approaches.

B. BLOCKCHAIN'S DECENTRALIZED SOLUTION

Blockchain, with its decentralized and immutable database, offers a promising solution to the challenges faced by traditional crowdfunding platforms. By leveraging the unique features of blockchain, such as immutability and distribution, the vulnerabilities associated with centralized control can be mitigated. The distributed ledger of blockchain not only ensures transparency but also introduces a layer of security crucial for the sensitive nature of financial transactions.

C. Smart Contracts and Ethereum

A focal point of this paradigm shift is the integration of Ethereum smart contracts, created using the Solidity language. These digital contracts, executing automatically when predefined conditions are met, facilitate secure and trustful transactions without the need for a central authority. MetaMask, a cryptocurrency wallet, acts as a bridge, enabling secure interactions with decentralized applications on the Ethereum network..

The objective of this review is to comprehensively examine the landscape of blockchain-based crowdfunding. By synthesizing insights from research papers, we delve into the strengths and limitations of existing platforms, analyze user perceptions, and evaluate the impact of blockchain on reshaping the crowdfunding ecosystem. Throughout this exploration,

the emphasis remains on establishing a foundation for blockchain-based crowdfunding networks that prioritize privacy, security, and decentralization.

II. LITERATURE REVIEW

A. Crowdfunding Landscape and Traditional Challenges

The crowdfunding landscape has undergone significant transformations, especially amplified during the Covid-19 era. Platforms like Kickstarter.com and Indiegogo.com have been instrumental in enabling campaigns ranging from individual assistance to large-scale initiatives. However, inherent vulnerabilities, such as data breaches, high fees, and fraud, persist due to the anonymity of user identities, prompting the exploration of novel solutions.

B. Blockchain as a Game-Changer:

Blockchain technology emerges as a disruptive force in addressing the shortcomings of traditional crowdfunding. With its decentralized and immutable characteristics, blockchain ensures transparency and reduces fraud risk. The versatility of the blockchain ledger and the application of smart contracts, notably in languages like Solidity and Vyper on platforms like Ethereum, redefine the possibilities for secure and automated transactions.

C. In-Depth Exploration of Blockchain Crowdfunding Platforms

The literature navigates through diverse blockchain-based crowdfunding platforms, each offering unique features. Notable examples include LikeStarter, a decentralized autonomous organization (DAO) on Ethereum, showcasing the potential of sharing and supporting content through custom ERC-20 tokens. Modular crowdfunding platforms utilizing Ethereum and Solidity present secure and transparent transactions, albeit with potential challenges in user comprehension.

D. Innovative Models and Potential Challenges:

Beyond the conventional crowdfunding paradigm, the literature delves into innovative economic models. WHIRL's pay-it-forward approach, creating a positive feedback loop of generosity, and cryptocurrency investment platforms like BitFund introduce unique dynamics. However, challenges such as the accumulation of Karma points and the intricacies of cryptocurrency dynamics highlight areas for further investigation.

E. Security Enhancement and Digital Identity Management:

Recognizing the vulnerabilities of traditional crowdfunding, the literature proposes robust solutions. Integration of digital identity management with blockchain not only enhances security but also offers a cost-effective alternative to traditional Know Your Customer (KYC) systems. This approach fortifies crowdfunding ecosystems against centralized architecture attacks, paving the way for more secure and transparent transactions.

F. Critical Evaluation and Research Gaps:

While current research showcases the potential of blockchain-based crowdfunding, critical evaluations pinpoint challenges. Issues such as user understanding, technical complexities, and scalability emerge as focal points requiring further exploration. The literature emphasizes the significance of ongoing research to refine existing models and address emerging challenges in this evolving landscape.

III. TYPES OF CROWDFUNDING

The selection of crowdfunding models is often contingent on the nature of the venture and its overarching goals. Three fundamental types characterize the crowdfunding landscape, each tailored to specific business structures and objectives:

A. Debt-Based Crowdfunding

Termed as "peer-to-peer" lending, this crowdfunding variant involves contributors who anticipate the repayment of their investment with interest. Remarkably, it circumvents conventional banking channels, fostering a direct connection between investors and entrepreneurs.

B. Equity-Based Crowdfunding:

Within this framework, investors acquire partial ownership of the business project, entitling them to dividends. This model introduces an element of risk, akin to a financial gamble, as the success of the project dictates the fluctuation of share values.

C. Donation-Based Crowdfunding:

Focused on the principle of altruism, investors in donation-based crowdfunding do not seek financial returns. Typically associated with cause-oriented projects, such as charities and disaster relief efforts, contributors invest based on their belief in the project's mission. While financial returns are absent, expressions of gratitude in the form of perks are often extended to donors.

IV. PROPOSED METHOD

A. Smart Contract Integration

The foundation of the proposed blockchain-based crowdfunding network lies in the integration of smart contracts using the Solidity language on the Ethereum blockchain. Smart contracts, as demonstrated in various platforms like LikeStarter [1], serve as digital, automated agreements that execute predefined actions when specific conditions are met. This ensures secure and trustworthy transactions, eliminating the need for a central authority and enhancing transparency in the crowdfunding process.

B. Decentralized Application (DApp) Utilization:

Unlike traditional web-based applications, the proposed system leverages a decentralized application (DApp) model based on the Ethereum blockchain. In this paradigm, all campaign-related information,

contributions, withdrawal requests, and funds are stored on an open blockchain network accessible to all participants. This implementation embraces the concept of distributed ledger technology, fostering transparency and enabling every network participant to access and validate the information recorded on the blockchain.

C. Immutable Ledger and Enhanced Security:

Ensuring an immutable ledger is a cornerstone of the proposed methodology. Drawing insights from platforms like LikeStarter, once a transaction is recorded on the blockchain, it becomes resistant to tampering. The decentralized storage of blockchain databases on every network node adds an extra layer of security, mitigating the risks associated with data breaches and unauthorized access.

V. ADVANTAGES OF BLOCKCHAIN-BASED CROWDFUNDING

A. Transparency and Trust:

Blockchain ensures a transparent and immutable ledger of transactions, fostering trust among participants. Smart contracts automate crowdfunding agreements, reducing the need for intermediaries and enhancing transparency.

B. Security:

Advanced cryptographic techniques in blockchain enhance the security of transactions, making the crowdfunding process highly resistant to fraud, tampering, or unauthorized access. Funds stored in blockchain-based wallets are secure, reducing the risk of theft.

C. Global Accessibility:

Blockchain facilitates global participation in crowdfunding campaigns, eliminating geographical restrictions. Anyone with an internet connection and a cryptocurrency wallet can contribute, promoting inclusivity and expanding the pool of potential backers.

D. Reduced Intermediaries and Costs:

Blockchain minimizes or eliminates the need for intermediaries like banks, reducing transaction fees and administrative costs. Smart contracts automate fund distribution, streamlining the process and lowering overhead expenses.

E. Immutability:

The distributed and immutable nature of blockchain ensures that recorded transactions cannot be easily altered. This feature enhances the trustworthiness of crowdfunding activities and provides resistance against fraud.

VI. CHALLENGES AND DISADVANTAGES OF CROWDFUNDING

A. Complexity and Technical Knowledge:

Challenge: Blockchain technology, which underlies many crowdfunding platforms, is still relatively complex and requires specialized technical knowledge for development and maintenance.

Disadvantage: This complexity can create barriers for non-technical users or project creators who may struggle to navigate the platform effectively.

B. Volatility and Risk:

Challenge: Cryptocurrencies, often used for transactions in blockchain-based crowdfunding, can be subject to significant price volatility.

Disadvantage: This introduces risk for both project creators and backers, as the value of funds raised or pledged can fluctuate, affecting the project's financial viability.

C. Storage Challenges:

Challenge: Blockchain databases are stored on every node of the network, leading to potential storage problems as the volume of transactions increases.

Disadvantage: More storage space is required as the platform grows, which could pose challenges for maintaining and managing the distributed ledger.

D. Time-Consuming Transactions:

Challenge: Blockchain transactions, particularly in Proof of Work (PoW) systems, can be time-consuming.
Disadvantage: The need for miners to compute nonce values multiple times for each block can impact transaction speed, potentially affecting the user experience.

E. Irreversibility of Transactions:

Challenge: Once transactions are recorded on the blockchain, they are typically irreversible.

Disadvantage: In the context of crowdfunding, this lack of dispute resolution mechanisms can pose risks for backers if a project fails to deliver on its promises or turns out to be fraudulent.

VII. CONCLUSION

In conclusion, this review paper delves into the transformative potential of blockchain technology in the realm of crowdfunding. Drawing insights from a comprehensive analysis of existing research papers, the review highlights the multifaceted advantages of adopting blockchain, such as enhanced transparency, security, and global accessibility. The literature review presented an overview of various blockchain-based crowdfunding platforms, emphasizing their strengths and limitations. Methodologies employed in these studies were explored to understand the approaches used in investigating the impact of blockchain on crowdfunding. The proposed methods and system architectures showcased the innovative applications of blockchain in creating decentralized and secure crowdfunding ecosystems. Despite the evident advantages, challenges such as technical complexity and market volatility were discussed. The paper concludes by pointing towards future directions, including regulatory considerations, integration with emerging technologies, and the evolving landscape of blockchain-based crowdfunding. As the field continues to evolve, this review offers a

comprehensive understanding of the current state and sets the stage for future exploration and innovation in blockchain-enabled crowdfunding.

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Cite this article as :

Prof. Sonali Dongare, Vishwajeet Bamane, Abhishek More, Prasad Chopade, Saurabh Aherwadkar, Nitin Dhawas, "Crowd-Funding using Blockchain", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 10 Issue 6, pp. 223-228, November-December 2023.
Journal URL : <https://ijsrset.com/IJSRSET2310615>