GoGrowFund- A Comprehensive Website For Fund

Saurabh Yamgar
BE in Information Technology
Vidyalankar Institute of Technology
saurabh.yamgar@vit.edu.in

Syed Rashid Geelani
BE in Information Technology
Vidyalankar Institute of Technology
syed.geelani@vit.edu.in

Saurabh Pandey
BE in Information Technology
Vidyalankar Institute of Technology
saurabh.pandey@vit.edu.in

Prof. Dilip Motwani
Assistant Professor
Department of Information Technology
Vidyalankar Institute of Technology
dilip.motwani@vit.edu.in

***Abstract*— Initially, blockchain was only used as a foundation of cryptocurrency, but today, we can see the rise of this new emerging technology is being implemented in many industries. In the future, most technologies around the world are expected to use blockchain as an efficient way to make online transactions. One of the areas that blockchain technologies can be applied is crowdfunding platforms. The most common problem with the current crowdfunding scene around the world is that the campaigns are not regulated and some of the crowd-funding campaigns turned out to be fraud. Besides, the completion of some projects was also significantly delayed. This project aims to solve these problems by applying Ethereum smart contracts to the crowdfunding site to that the contracts will be fully automatically executed, thus preventing frauds, and ensuring that the projects can be delivered within duration given.**

I. INTRODUCTION

In simple terms, crowdfunding can be defined as raising funds for a project or a campaign by a group of people instead of using established entities such as banks or loan providers. Freedman and Nutting [1] defined crowdfunding as a method of collecting many small contributions, by means of an online funding platform, to finance or capitalize a popular enterprise. The crowdfunding action mainly involved three parties, which are the contributors, crowdfunding platform, and project managers. Some popular crowdfunding platforms include kickstarter.com, Indiegogo.com and mystartr.com. The main benefit of crowdfunding is that it can raise the amount of money needed in a short amount of time. This is due to that many people today use Internet and social media which means that through these channels the project founder can reach out the public within a short amount of time [2]. Besides, many project founders have chosen crowdfunding to raise money for their projects as it is harder to gain loans from bank or other investors [3]. This happens because that most loans take a long time to be processed. Some studies also stated that there are benefits of crowdfunding in non-financial terms. For instance, crowd funders can provide value-added involvement and feedback to the project, while also creating publicity and public awareness of the business [4]. Schlueter [5] believes that there are two main advantages of crowdfunding. The first benefit is crowdfunding provides better matches between the inventors and the funders from all around the world. The second advantage is investors also have access to more information in the initial phase of the project. This information is very valuable to investors and might boost their eagerness to invest in such crowdfunding projects. However, despite having several advantages, crowdfunding platforms still have many flaws that need to be improved. One of the main issues that have been in traditional crowdfunding platform is fraud cases [6], stated that online crowdfunding leaves contributors susceptible to fraud because traditional legal and reputation security measures may not work. This is further stressed in [7] who stated as no ρ ISSN: 2502-4752 Indonesian J Elec Eng & Comp Sci, Vol. 15, No. 1, July 2019: 409 - 413 410 credentials are needed to post a project and, once the project has been posted, and there are few legal obligations to deliver what the project promised.

II. PROBLEM STATEMENT

In the realm of crowdfunding, conventional platforms often face critical challenges related to transparency, security, and trust. These issues can manifest in various forms such as fraudulent activities, misallocation of funds, lack of accountability, and high transaction costs. Traditional crowdfunding platforms heavily rely on centralized

intermediaries, leading to inefficiencies, delays, and potential points of failure.

Moreover, backers and project creators often experience obstacles in cross-border transactions, currency conversions, and regulatory compliance, limiting the global reach and inclusivity of crowdfunding campaigns. These challenges hinder the potential growth and impact of crowdfunding initiatives, particularly for small-scale projects and individuals in underserved communities.

To address these issues, integrating blockchain technology into crowdfunding platforms offers promising solutions. Blockchain, with its decentralized nature, immutable ledger, and smart contract functionalities, can revolutionize crowdfunding by providing transparency, security, and efficiency throughout the fundraising process.

However, implementing blockchain in crowdfunding platforms presents its own set of challenges and complexities. Designing a decentralized system that ensures transparency while protecting user privacy is crucial. Smart contracts must be carefully crafted to automate and enforce the terms of crowdfunding campaigns, mitigating risks of fraud and mismanagement. Additionally, scalability, interoperability, and regulatory compliance are key considerations to ensure the widespread adoption and sustainability of blockchain-based crowdfunding platforms.

III. FLOWCHART

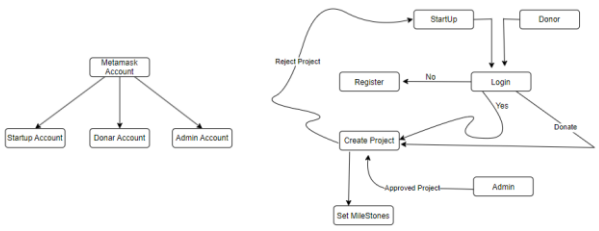

Fig. 5 : Flowchart

IV. PROPOSED ALGORITHM

1. Admin Login:

- The system will allow startups to register by providing necessary information about the project or campaign.
- Upon submission, the system will validate the information and system approved the project or campaign therefore backer or donor can donate the project.

2. Startup Registration:

- startup register through form provided by the system, startup can login if they have the credentials such as MetaMask address.
- startup can create the project or campaign for the fund.

3. Create Project:

- when startup login or register to the system they can create the project through form provided by the system.
- startup create the project or campaign for the fund.
- startup provide all the information about the project and the links of the project therefore donor or backer can donate to the campaigns also setup the milestones therefore money will be taken in the chunks by the startups . they provide the information about how much money they are raising

4. Administration Process:

- Start up created project using the form which are provided by the system , after creating the system will check all the documents and files provided by the startup.
- system will have the two option accept project or reject project .
- If the system accept the project then it will further used for the fund raising , if it is rejected or abort from the system then project will not create or the donor cannot donate any ETH to that Project

5. Backer/Donor Registration:

- Donor or backer register through form provided by the system , if it is already register then it is login through the MetaMask address .
- donor can donate to the project.

6. Donor Donate ETH:

- Donor created account using the system provided form.
- donor donate ETH to the project which are created by the startups.

Permissioned Blockchain:

Permissioned blockchains are a type of blockchain network where access and participation are controlled by a central authority or a consortium of entities. Unlike permissionless blockchains like Bitcoin and Ethereum, where anyone can join the network, permissioned blockchains require users to obtain explicit permission to access and interact with the network. Here are some key characteristics and considerations regarding permissioned blockchains:

1. Access Control: Permissioned blockchains restrict access to authorized participants only. Permissioning can be based on various criteria, such as identity verification, credentials, or membership status in a consortium. This access control mechanism enhances privacy and security by preventing unauthorized access to sensitive data and operations.

2. Governance: Governance in permissioned blockchains is typically centralized or semi-decentralized, with a designated entity or consortium responsible for making decisions regarding network operation, protocol updates, and dispute resolution. Governance structures may include voting mechanisms or predetermined rules agreed upon by network participants.
3. Performance and Scalability: Permissioned blockchains often prioritize performance and scalability over decentralization and censorship resistance. Since the number of participating nodes is limited and controlled, permissioned blockchains can achieve higher transaction throughput and lower latency compared to permissionless blockchains.
4. Consensus Mechanisms: Permissioned blockchains can employ various consensus mechanisms tailored to the specific requirements of the network. Consensus algorithms such as Practical Byzantine Fault Tolerance (PBFT), Raft, and Proof of Authority (PoA) are commonly used in permissioned blockchains to achieve fast transaction finality and ensure network reliability.
5. Use Cases: Permissioned blockchains are well-suited for enterprise applications and industries that require regulatory compliance, data privacy, and controlled access to sensitive information. Use cases include supply chain management, healthcare data sharing, financial services, and identity management, where stakeholders need to collaborate securely while adhering to industry regulations and standards.
6. Interoperability: Interoperability between different permissioned blockchain networks or between permissioned and permissionless blockchains is an important consideration for achieving seamless data exchange and interoperability across decentralized ecosystems. Standards such as Hyperledger Fabric and Enterprise Ethereum Alliance (EEA) specifications aim to facilitate interoperability and compatibility between permissioned blockchain platforms.
7. Security and Trust: Permissioned blockchains offer enhanced security and trust compared to centralized databases or traditional IT systems, as data immutability, cryptographic authentication, and consensus mechanisms ensure the integrity and authenticity of transactions and records. However, the level of security may vary depending on the design of the permissioned blockchain network and its governance model.
Overall, permissioned blockchains provide a balance between decentralization and control, offering enterprises and organizations a pragmatic approach to leveraging blockchain technology for their specific use cases while addressing regulatory, privacy, and scalability requirements.

Algorithms:

1. Smart Contract Execution Algorithms:
Smart contracts are self-executing contracts with the terms of the agreement directly written into code. Algorithms within smart contracts govern various aspects of crowdfunding campaigns, including the release of funds, milestone verification, and distribution of rewards or dividends. These algorithms ensure that transactions occur automatically and transparently once predefined conditions are met.

2. Consensus Algorithms:
Consensus Algorithms: Consensus algorithms are used to validate and agree upon the state of the distributed ledger within the blockchain network. Popular consensus mechanisms such as Proof of Work (PoW), Proof of Stake (PoS), Delegated Proof of Stake (DPoS), and Practical Byzantine Fault Tolerance (PBFT) ensure the security and integrity of transactions on the crowdfunding platform.

3. Matching Algorithms:
Matching algorithms are used to connect project creators with suitable backers based on their preferences, interests, and investment criteria. These algorithms aim to optimize the matching process to ensure that backers find projects aligned with their investment goals, thereby increasing the likelihood of successful crowdfunding campaigns.

4. Reputation Scoring Algorithms:
Reputation scoring algorithms assess the credibility and trustworthiness of project creators and backers participating in crowdfunding campaigns. These algorithms may consider factors such as past project success/failure rates, community engagement, ratings, and reviews to assign reputation scores. Reputation systems enhance transparency and help mitigate fraud within the crowdfunding ecosystem.

5 Fraud Detection Algorithms:
Fraud detection algorithms monitor crowdfunding activities for suspicious behaviour and identify potential fraudulent transactions or activities. These algorithms leverage techniques such as machine learning and anomaly detection to analyse transaction patterns, user behaviour, and other relevant data to detect and prevent fraudulent activities on the platform.

V. IMPLEMENTATION

Implementing a crowdfunding project using blockchain involves several key steps, including defining project requirements, choosing the right blockchain platform, developing smart contracts, building a user interface, and promoting the project to attract backers. Here's a step-by-step guide to help you implement a crowdfunding project using blockchain:

A. Define Project Requirements:

Clearly define the goals, scope, and requirements of your crowdfunding project. Determine what type of project you want to fund (e.g., product development, charitable cause, artistic endeavor) and establish fundraising targets, campaign durations, and reward structures for backers.

B. Choose a Blockchain Platform:

Select a suitable blockchain platform for your crowdfunding project. Consider factors such as scalability, transaction fees, smart contract capabilities, and community support when choosing a platform. Ethereum, Binance Smart Chain, and Polkadot are popular choices for crowdfunding projects due to their robust smart contract functionality and developer ecosystems.

C. Develop Smart Contracts:

Design and develop smart contracts that govern the crowdfunding process. Smart contracts should define the rules for creating and managing crowdfunding campaigns, handling fund collection, verifying project milestones, and distributing funds to project creators. Use programming languages like Solidity or Vyper to implement smart contracts on your chosen blockchain platform.

D. Build User Interface:

Develop a user-friendly interface for your crowdfunding platform where users can create, browse, and contribute to crowdfunding campaigns. Design intuitive user flows for campaign creation, donation submission, and tracking campaign progress. Ensure that the user interface integrates seamlessly with the blockchain backend to fetch data from smart contracts and display real-time updates to users.

E. Implement Payment Integration:

Integrate payment gateways or cryptocurrency wallets to facilitate contributions to crowdfunding campaigns. Support multiple payment methods, including fiat currencies and cryptocurrencies, to accommodate a wide range of backers. Implement secure payment processing logic to handle fund transfers securely and transparently on the blockchain.

F. Promote the Project:

Market and promote your crowdfunding project to attract backers and raise awareness. Utilize social media, email marketing, press releases, and community outreach to reach potential supporters and encourage them to contribute to your campaign. Highlight the unique value proposition of your project and showcase the impact it will make to attract backers.

G. Ensure Security and Compliance:

Implement security best practices to protect user data and funds stored on the blockchain. Follow regulatory guidelines and compliance requirements relevant to crowdfunding activities, especially if dealing with financial transactions or investor funds. Conduct security audits and penetration testing to identify and address vulnerabilities in your crowdfunding platform.

H. Launch and Manage the Campaign:

Launch your crowdfunding campaign and actively manage it throughout its duration. Monitor campaign progress, engage with backers, and provide regular updates on project milestones and achievements. Address any issues or concerns raised by backers promptly to maintain trust and credibility.

I. Distribute Funds and Fulfill Rewards:

Once the crowdfunding campaign reaches its fundraising goal, distribute funds to project creators according to the terms outlined in the smart contracts. Fulfil rewards or incentives promised to backers in a timely manner to ensure satisfaction and encourage future participation in your crowdfunding projects.

J. Evaluate and Iterate:

After the crowdfunding campaign concludes, evaluate its performance, and gather feedback from participants. Identify areas for improvement and iterate on your crowdfunding platform to enhance user experience, streamline processes, and maximize the success of future campaigns.

VI. RESULTS

Implementation of blockchain technology in crowdfunding platform increase contributor's confidentiality when contributing to campaign. This is due to the nature of blockchain transactions which are transparent. All users can view the records of each transaction which can be seen by using Ethers can API. Besides, the implementation of smart contracts also eliminates the need for trust of each stakeholder for the campaign as the contract is automatically executed once the conditions are met. We are in midst of finalizing Indonesian J Elec Eng & Comp Sci ISSN: 2502-4752 ρ Blockchain based crowdfunding systems (Md Nazmus Saadat) 413 the implementation of the system and data of the results would be available soon which is not yet available in our hand at this moment. There would be some acceptance study as well which is also in progress. Implementation of blockchain technology in crowdfunding platform increase contributor's confidentiality when contributing to campaign. This is due to the nature of blockchain transactions which are transparent. All users can view the records of each transaction which can

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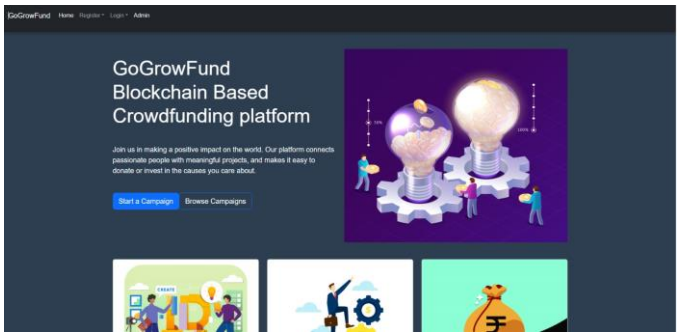

Fig. 1: Crowdfund Homepage

As seen in Fig 1 we have implemented the Crowdfund homepage using React. The UI is very minimalistic to decrease the friction required by user to access the service provided by our project.

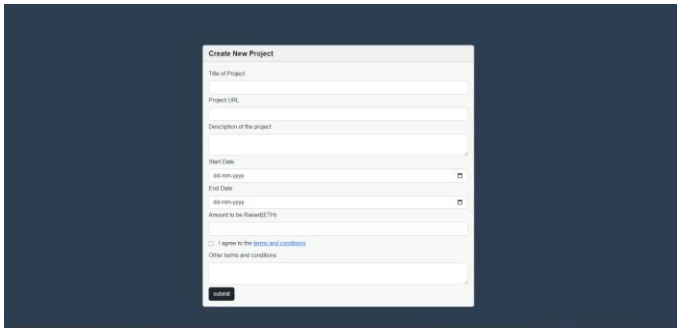

Fig. 2: Create New Project Page

As seen in Fig 2 we have implemented the page where user can create the campaign or project for the fund using the create new project option.

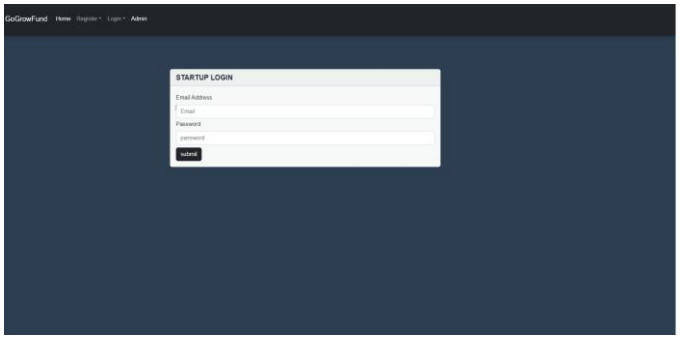

Fig 3: Admin Login Page

Admin can login in Fig 3

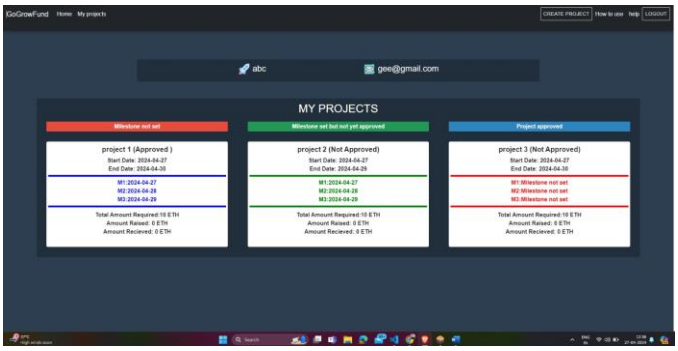

Fig. 4: All project of Users

As seen in fig 4 user can see their campaign or project which are created for the fund and created by using the create project option, here user can access all their project by providing the MetaMask address as login credentials.

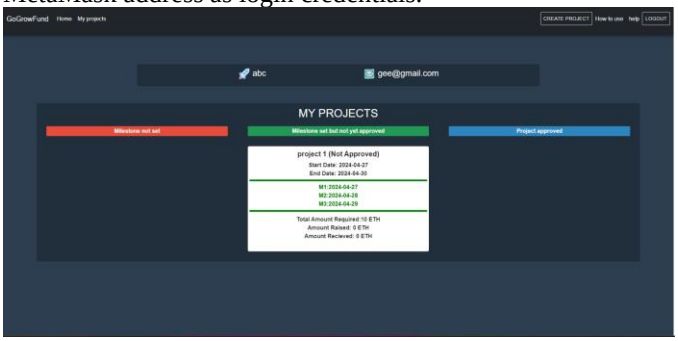

Fig. 5: User created Project.

In Fig. 5 as user is created their project but it is not approved from the administrator for the fund.

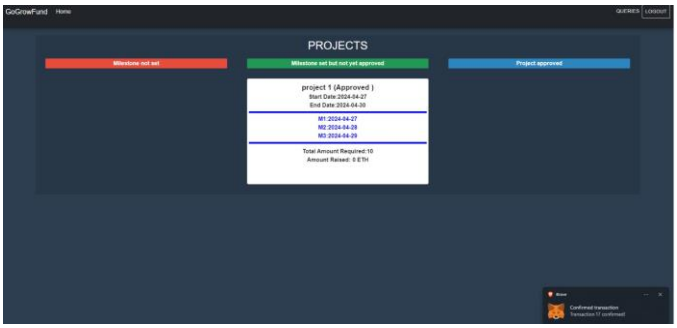

Fig. 6: Admin approved project

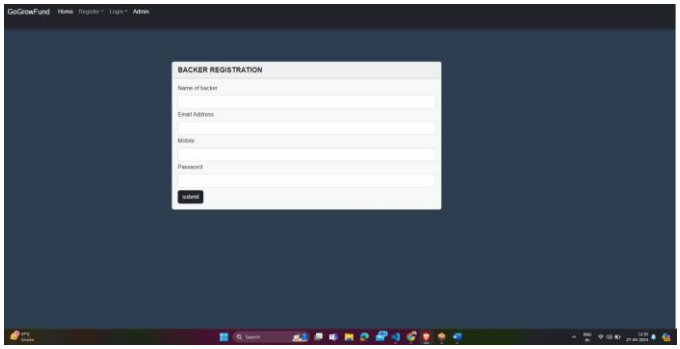

Fig. 7: Backer/Donor Registration

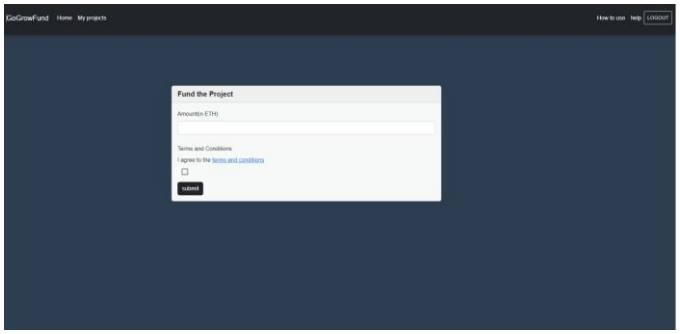

Fig. 8: Backer/Donor Donate fund

As seen in fig.7 and fig 8. Backer/Donar first create the account as donor and then donate to the project or campaign created by the user for the fund and provide required amount.

VII. CONCLUSION:

IN CONCLUSION, THE INTEGRATION OF BLOCKCHAIN TECHNOLOGY INTO CROWDFUNDING PLATFORMS PRESENTS A PROMISING AVENUE FOR REVOLUTIONIZING FUNDRAISING ECOSYSTEMS. BY LEVERAGING BLOCKCHAIN'S TRANSPARENCY, SECURITY, AND DECENTRALIZED NATURE, THESE PLATFORMS OFFER ENHANCED TRUST AND ACCOUNTABILITY, EMPOWERING BOTH CREATORS AND BACKERS. HOWEVER, CHALLENGES SUCH AS SCALABILITY, REGULATORY COMPLIANCE, AND USER ADOPTION REMAIN SIGNIFICANT HURDLES. WITH CONTINUED INNOVATION AND COLLABORATION, CROWDFUNDING PLATFORMS CAN HARNESS THE FULL POTENTIAL OF BLOCKCHAIN TO FOSTER GREATER INCLUSIVITY, EFFICIENCY, AND INTEGRITY IN FUNDRAISING ENDEAVORS.

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