CROWDFUNDING PLATFORM WITH BLOCKCHAIN INTEGRATION

A MINI-PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

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ABSTRACT

Blockchain technology has revolutionized crowdfunding by enhancing transparency, security, and decentralization. This project presents a blockchain-integrated crowdfunding platform leveraging Thirdweb for smart contract deployment and MetaMask for secure wallet integration. The platform enables users to create, fund, and manage campaigns in a trustless environment, eliminating intermediaries and reducing transaction costs. Key features include smart contract-based fund management, real-time donation tracking, and secure contributor authentication. A user-centric approach was adopted, ensuring seamless onboarding, intuitive navigation, and enhanced security. This study explores the implementation of blockchain in crowdfunding, detailing the benefits of Decentralized Finance (DeFi) and the challenges faced. The findings highlight the potential of blockchain to revolutionize fundraising by fostering trust and efficiency in financial transactions.

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CHAPTER 1
INTRODUCTION

Crowdfunding has become a vital tool for raising funds for projects, businesses, and social causes. Traditional crowdfunding platforms often involve intermediaries, high transaction fees, and a lack of transparency, which can lead to trust issues among contributors. To address these challenges, this project focuses on developing a blockchain-based crowdfunding platform that ensures transparency, security, and decentralization by leveraging Thirdweb for smart contract deployment and MetaMask for secure wallet integration.

This platform enables users to create, fund, and manage crowdfunding campaigns in a decentralized environment, eliminating the need for third-party intermediaries. The primary objective of this project is to enhance funding security, transaction efficiency, and trustworthiness by utilizing blockchain technology. To achieve this, a user-centered design approach was adopted, involving extensive research, surveys, and usability testing to identify existing challenges in traditional crowdfunding models.

This paper details the design, development, and implementation of the blockchain-integrated crowdfunding platform, emphasizing key aspects such as smart contract execution, decentralized fund management, real-time tracking, and automated refund mechanisms. Through this project, we demonstrate how blockchain technology can revolutionize crowdfunding by offering a trustless, secure, and efficient alternative to conventional fundraising methods.

CHAPTER 2

LITERATURE REVIEW

2.1 Blockchain-Based Crowdfunding: Opportunities and Challenges

Published in: 2021 International Conference on Blockchain Technology

1. This study explores the advantages of using blockchain technology in crowdfunding, emphasizing its transparency, security, and decentralization. The research highlights how blockchain eliminates the need for intermediaries, making crowdfunding more efficient and fraud-resistant. Smart contracts play a key role in automating fund disbursement, milestone-based funding, and refund mechanisms.
2. The study also examines the challenges associated with blockchain crowdfunding, including scalability issues, regulatory concerns, and user adoption barriers. It suggests that while blockchain provides enhanced security and immutability, the cost of transactions and technical complexity can hinder widespread adoption.

2.2 Smart Contract-Based Crowdfunding Platforms: A Comparative Study

Published: 2022-06-15

1. This study compares various smart contract-based crowdfunding platforms, evaluating their usability, security features, and transaction efficiency. It underscores the trustless nature of Ethereum-based platforms, where smart contracts automatically handle fund distribution without intermediaries.
2. The research highlights how gas fees and network congestion impact crowdfunding efficiency. The study also explores how different platforms implement tiered funding models, tokenized rewards, and governance mechanisms to enhance project credibility and backer trust.

2.3 Decentralized Finance (DeFi) and Its Impact on Crowdfunding

Published: 2023-02-10

1. The integration of Decentralized Finance (DeFi) with crowdfunding introduces new funding models that leverage liquidity pools, staking, and yield farming. This study analyzes how DeFi-based crowdfunding platforms enable backers to earn interest on locked funds while supporting projects.

2. research highlights how governance tokens and decentralized autonomous organizations (DAOs) allow community-driven decision-making in crowdfunding campaigns. The study discusses potential risks, such as rug pulls and smart contract vulnerabilities, and how auditing mechanisms can mitigate these risks.

2.4 User Experience (UX) in Blockchain Applications: Challenges and Best Practices

Published: 2023-09-05

1. While blockchain technology enhances security, UX challenges remain a major hurdle in mainstream adoption. This study examines common user pain points in blockchain applications, such as complex wallet interactions, lack of transaction transparency, and slow onboarding processes.
2. The research suggests best practices for improving UI/UX in blockchain-based crowdfunding platforms, including seamless MetaMask wallet integration, gas fee estimations, and educational prompts for first-time users. The study also discusses gamification elements and interactive dashboards to enhance user engagement and trust in decentralized applications (DApps).

2.5 Security and Regulatory Aspects of Blockchain Crowdfunding

Published: 2023-11-20

1. The study explores legal and security challenges in blockchain crowdfunding, focusing on smart contract audits, fraud prevention, and compliance with financial regulations. It discusses how regulatory frameworks in different regions impact blockchain-based fundraising efforts.
2. The research also highlights emerging security threats, such **as** phishing attacks, private key mismanagement, and exploitative tokenomics, and proposes strategies like multi-signature wallets, KYC/AML compliance, and risk assessment frameworks to enhance platform security.

This literature review provides a comprehensive foundation for the development of the blockchain-based crowdfunding platform in this project. It highlights key aspects such as smart contract automation, DeFi integration, security measures, UX best practices, and regulatory considerations, offering valuable insights to guide the design and implementation of a robust and user-friendly platform

CHAPTER 3

SOFTWARE USED - THIRDWEB

3.1 Tool Selection

In the development of our blockchain-based crowdfunding platform, we conducted a thorough evaluation of various smart contract deployment and blockchain development tools. Thirdweb emerged as the ideal choice due to its no-code smart contract deployment, seamless Web3 wallet integration, and developer-friendly infrastructure. Thirdweb allows us to build and launch blockchain applications without requiring extensive Solidity knowledge, making it a cost-effective and efficient solution.

3.2 Development and Implementation

By leveraging Thirdweb's pre-built smart contract templates, we streamlined the creation of fundraising contracts, milestone-based fund releases, and tokenized incentives. Its drag-and-drop UI facilitated rapid prototyping, allowing us to test different funding models efficiently. Thirdweb's compatibility with multiple EVM-compatible chains ensures flexibility in blockchain selection, enabling lower transaction fees and faster processing times.

3.3 Prototyping and Security

Thirdweb provides gas-efficient smart contracts that reduce costs for both project creators and backers. The real-time analytics dashboard helped us track campaign performance and user engagement. Additionally, Thirdweb's integrated auditing tools ensured smart contract security by mitigating vulnerabilities such as reentrancy attacks and unauthorized fund withdrawals.

3.4 Collaboration and Real-Time Updates

With Thirdweb's Web3 tools, we enabled seamless MetaMask and WalletConnect integration, allowing backers to contribute using cryptocurrency wallets with minimal friction. The cloud-based architecture ensured that all stakeholders—project owners, investors, and platform administrators—could collaborate and monitor campaign progress in real-time.

OUTPUT:

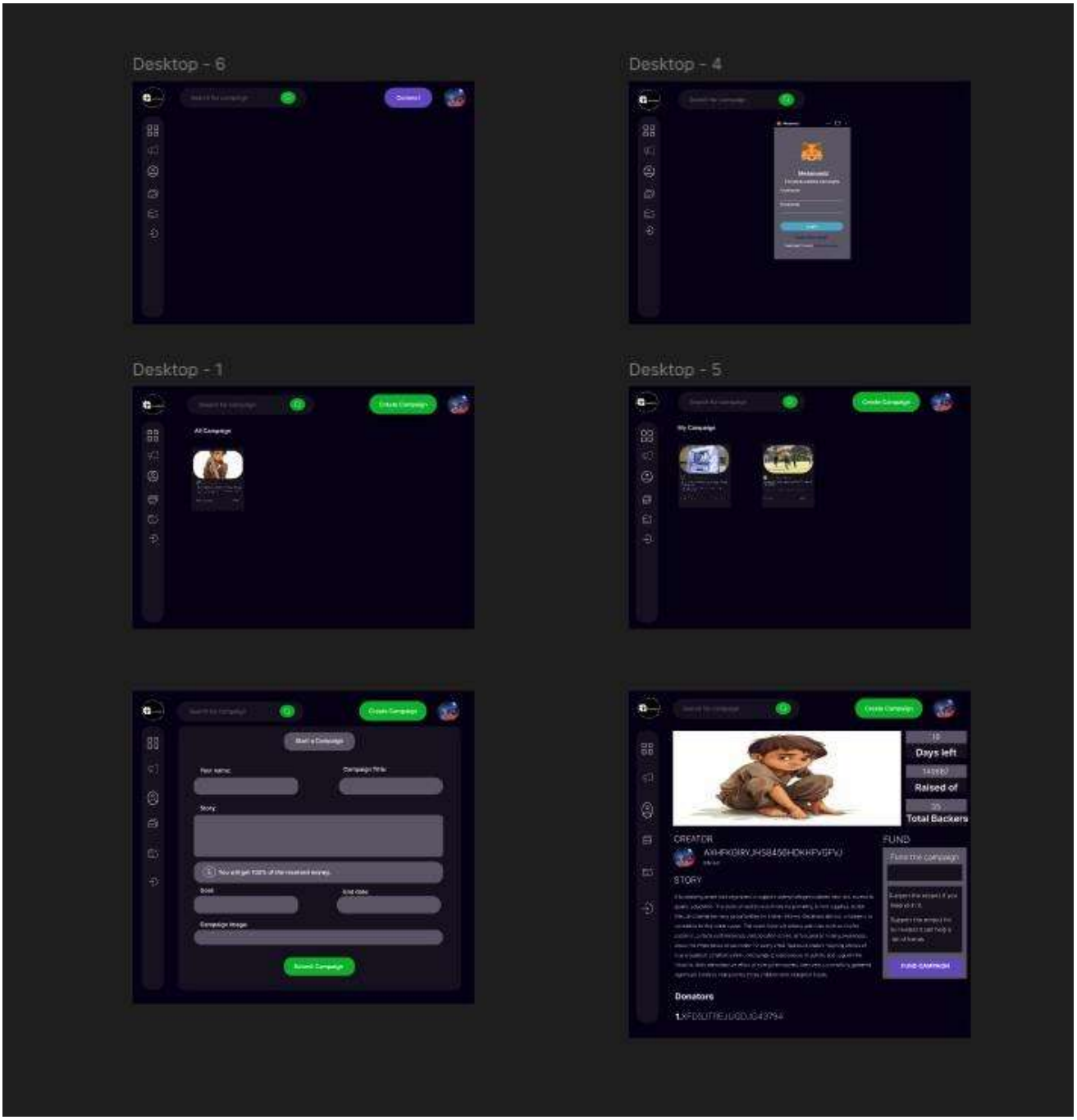

Fig 1: The user interface of the "FIGMA" software.

CHAPTER 4
PRESENT TECHNOLOGY

4.1 Software Architecture

Our crowdfunding platform follows a decentralized application (DApp) model, comprising the following components:

1. **Front End:** Built using React.js and Next.js, ensuring a responsive and user-friendly experience across web and mobile platforms.
2. **Back End:** Utilizes Node.js with Thirdweb SDK for seamless blockchain interactions.
3. **Blockchain Layer:** Supports Ethereum, Polygon, and Binance Smart Chain (BSC) for cost-effective and scalable crowdfunding.
4. **Smart Contracts:** Developed using Thirdweb's pre-audited contracts, ensuring security and automation for fund disbursement and refunds.
5. **Database:** Off-chain data is managed using IPFS for decentralized storage and Firebase for metadata storage.

4.2 Security and Compliance

Our platform incorporates KYC/AML verification for campaign creators to enhance trust. Multi-signature wallets and timelocked smart contracts prevent unauthorized fund withdrawals, ensuring funds are securely allocated based on predefined conditions.

4.3 User Interface and Experience

1. **Simplified onboarding**: Integration with MetaMask and WalletConnect allows seamless user authentication.
2. **Interactive dashboards**: Real-time campaign statistics and backer engagement insights.
3. **Multi-chain support**: Users can choose preferred blockchain networks to optimize for speed and transaction costs.

LIMITATIONS

While the blockchain-based crowdfunding platform leverages advanced technology, certain limitations remain:

1. Gas Fees and Scalability

1. High transaction costs on Ethereum may discourage micro-investors.
2. Solution: Supporting Layer 2 scaling solutions (Polygon, Arbitrum) for reduced fees.

2. Regulatory Uncertainty

1. Blockchain crowdfunding faces legal and compliance challenges in different jurisdictions.
2. Solution: Implementing KYC verification and regional compliance checks.

3. User Adoption and Education

1. Many users are unfamiliar with Web3 wallets and smart contracts.
2. Solution: Providing in-app tutorials and educational guides for first-time users.

4. Security Risks

1. Phishing attacks and private key mismanagement remain concerns.
2. Solution: Implementing multi-factor authentication and wallet security best practices.

CHAPTER 5
PROPOSED DESIGN

To enhance usability, security, and accessibility, our platform will undergo the following redesign improvements.

5.1 Enhanced User Experience (UX)

1. **Refined UI:** A modern, intuitive dashboard with real-time funding progress tracking.
2. **Simplified navigation:** Direct access to campaign listings, funding history, and withdrawal requests.
3. **Multilingual Support:** Enables wider adoption among non-English speakers.

5.2 Improved Fund Management

1. **Milestone-based funding:** Smart contracts will release funds incrementally based on pre-set conditions.
2. **Refund automation:** Backers can receive automatic refunds if funding goals are not met.
3. **Escrow-based payments:** Ensuring secure transactions through multi-sig wallets.

5.3 Community Governance & Decentralization

1. **DAO (Decentralized Autonomous Organization)** for community voting on project legitimacy.
2. **Governance tokens** will enable backers to participate in funding decisions.

5.4 Accessibility & Security Enhancements

1. **Seamless mobile experience:** Optimized for mobile Web3 wallets.
2. **Biometric authentication:** Users can access their accounts with face ID and fingerprint.
3. **AI fraud detection:** Detects suspicious activities and prevents scams

USER FLOW DIAGRAM:

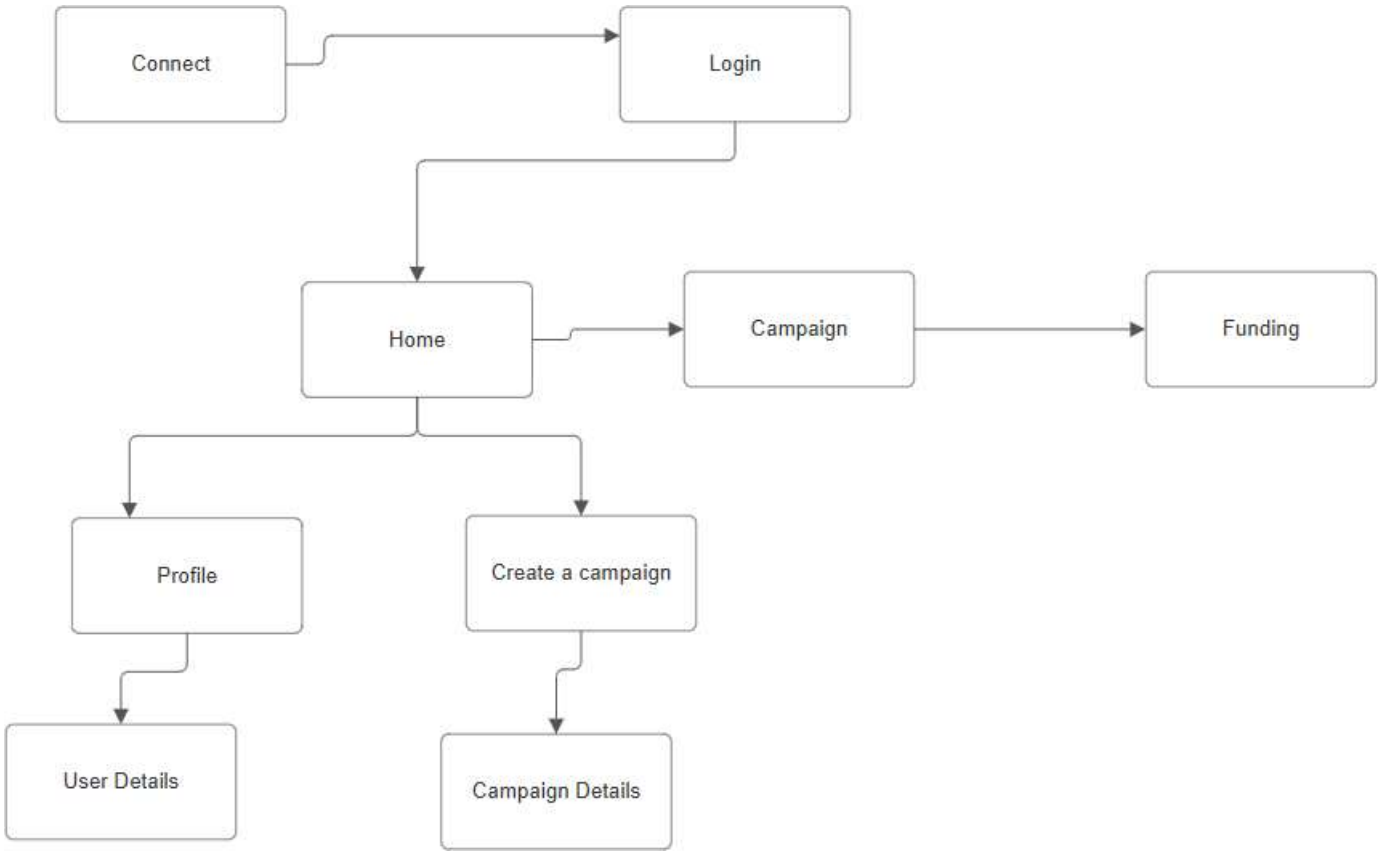

Fig 2:Flow Diagram of the Platform

ADVANTAGES

Redesigning the blockchain-based crowdfunding platform offers several advantages:

5.5 Increased Transparency & Security

1. Immutable smart contracts ensure fraud-resistant crowdfunding.
2. Auditable transaction history builds trust among backers.

5.6 Greater Accessibility & Inclusivity

1. Multi-chain compatibility allows users to choose cost-effective blockchain networks.
2. Multilingual support and mobile optimization expand the global user base.

5.7 Decentralized and Autonomous Governance

1. Community-driven funding decisions enhance credibility.
2. DAO voting mechanisms allow stakeholders to influence platform evolution.

5.8 Faster and Cost-Efficient Fundraising

1. Gas-efficient transactions reduce costs for campaign creators and contributors.
2. Automated funding and escrow solutions ensure fair fund distribution.

The implementation of these features will enhance usability, security, and efficiency**,** positioning our blockchain-based crowdfunding platform as **a** next-generation fundraising solution. These advancements will foster greater investor trust, improve project success rates, and expand financial inclusion in the Web3 ecosystem.

CHAPTER 6

OUTPUT

PROJECT LINK:
https://www.figma.com/design/SaU6RBIeAih3BmI6OQf146/FUNDSEEKER?t=0lmje2rvYyYKmUoQ-0

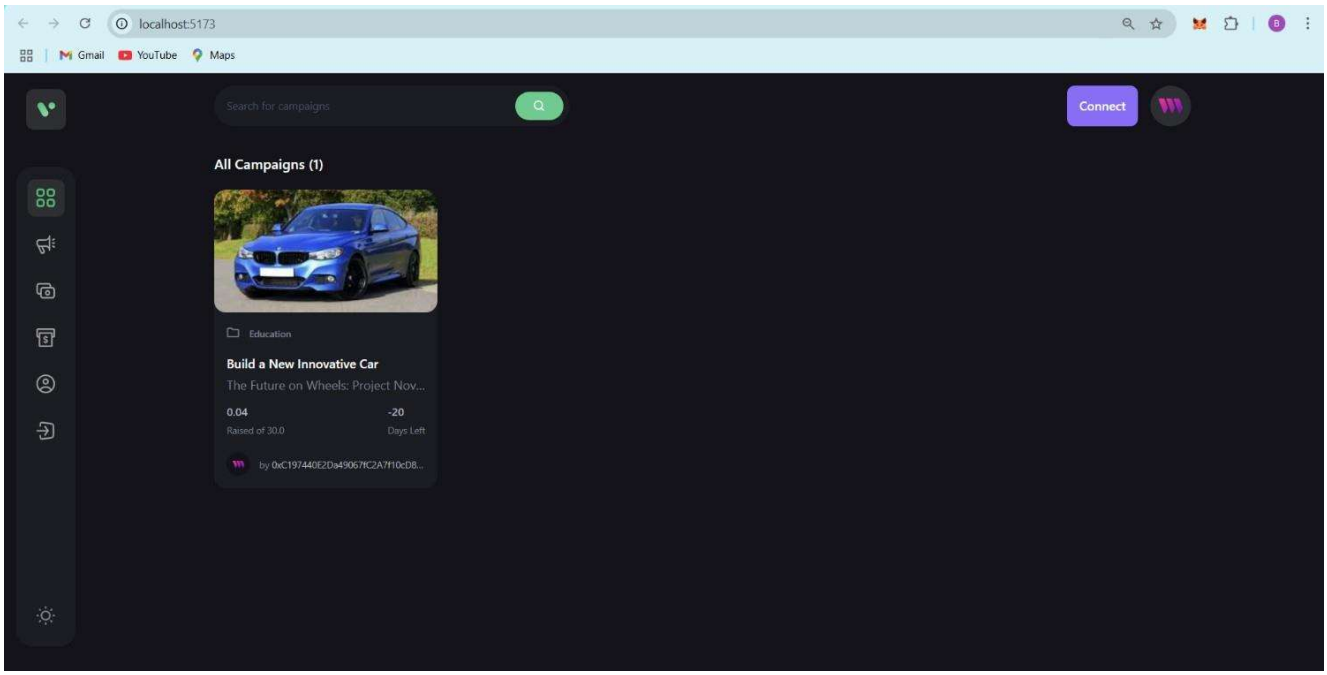

Fig 3: Home Page of Fundseeker(Crowdfunding Platform)

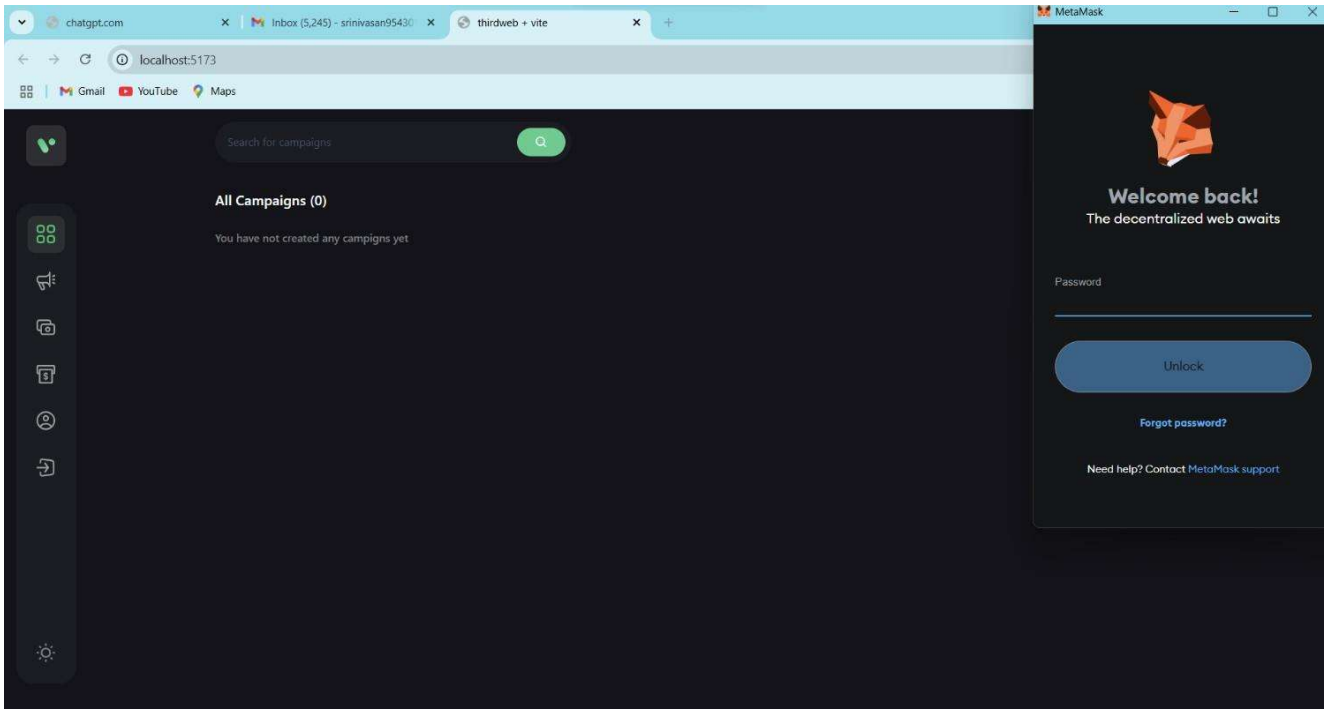

Fig 4: Connecting Metamask wallet with the Platform(Fundseeker)

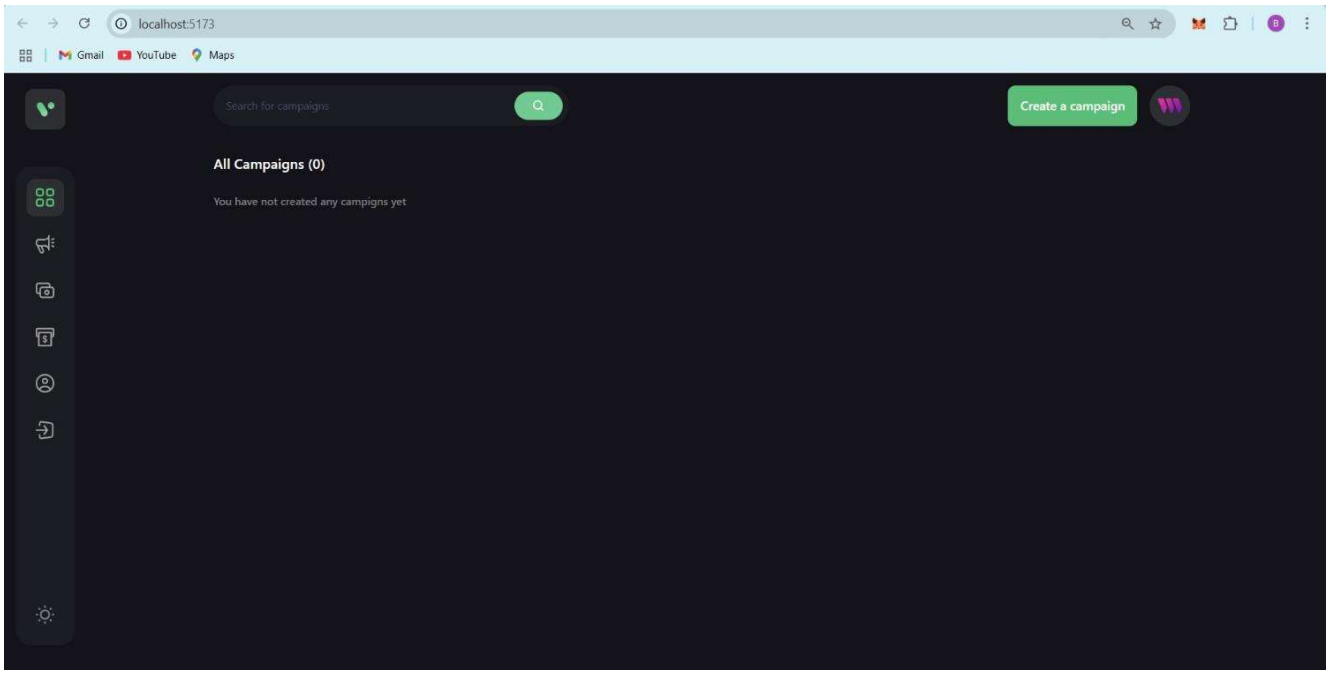

Fig 5: Home Page after linking the Metamask wallet

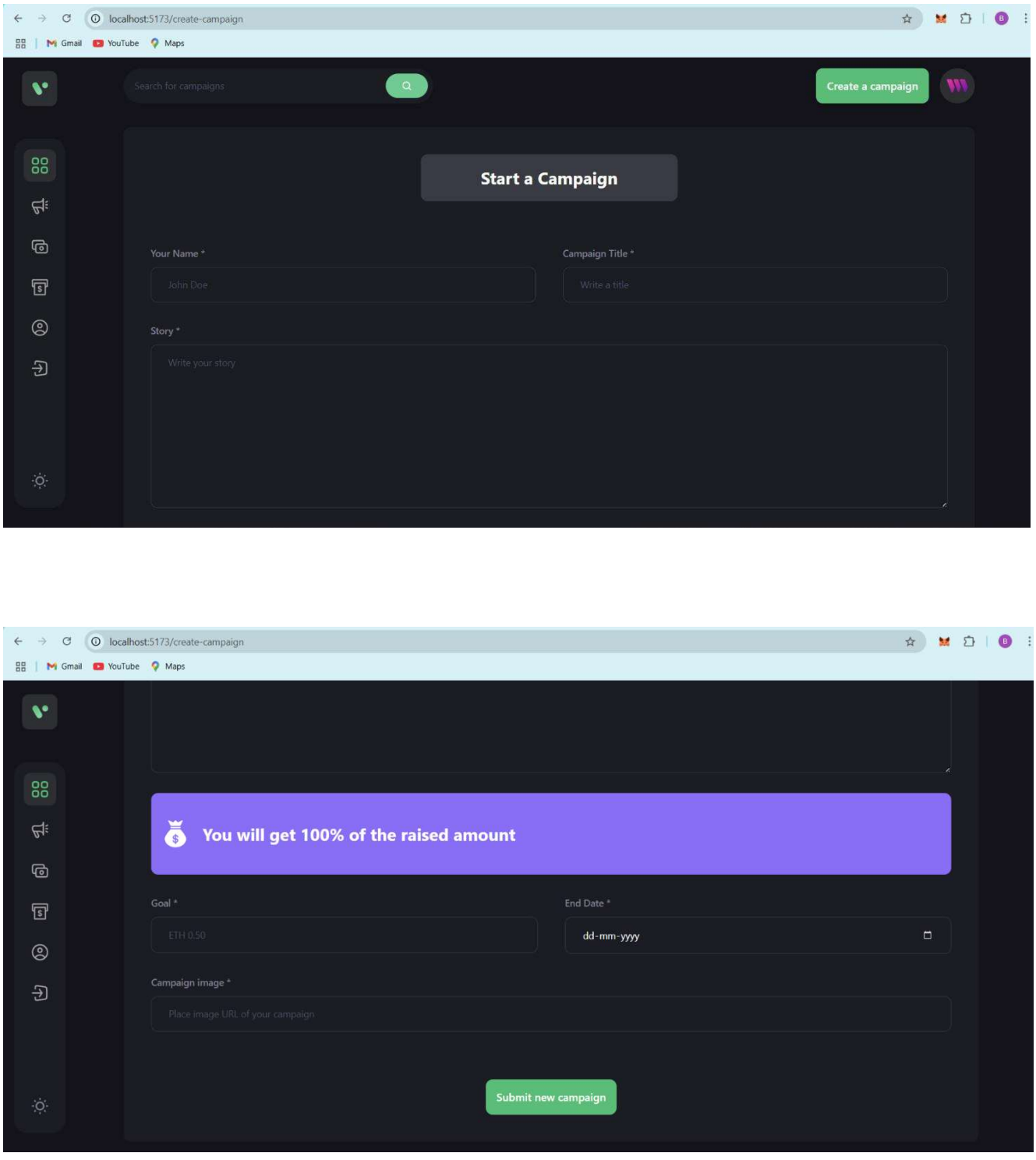

Fig6: Start Campaign to create a campaign

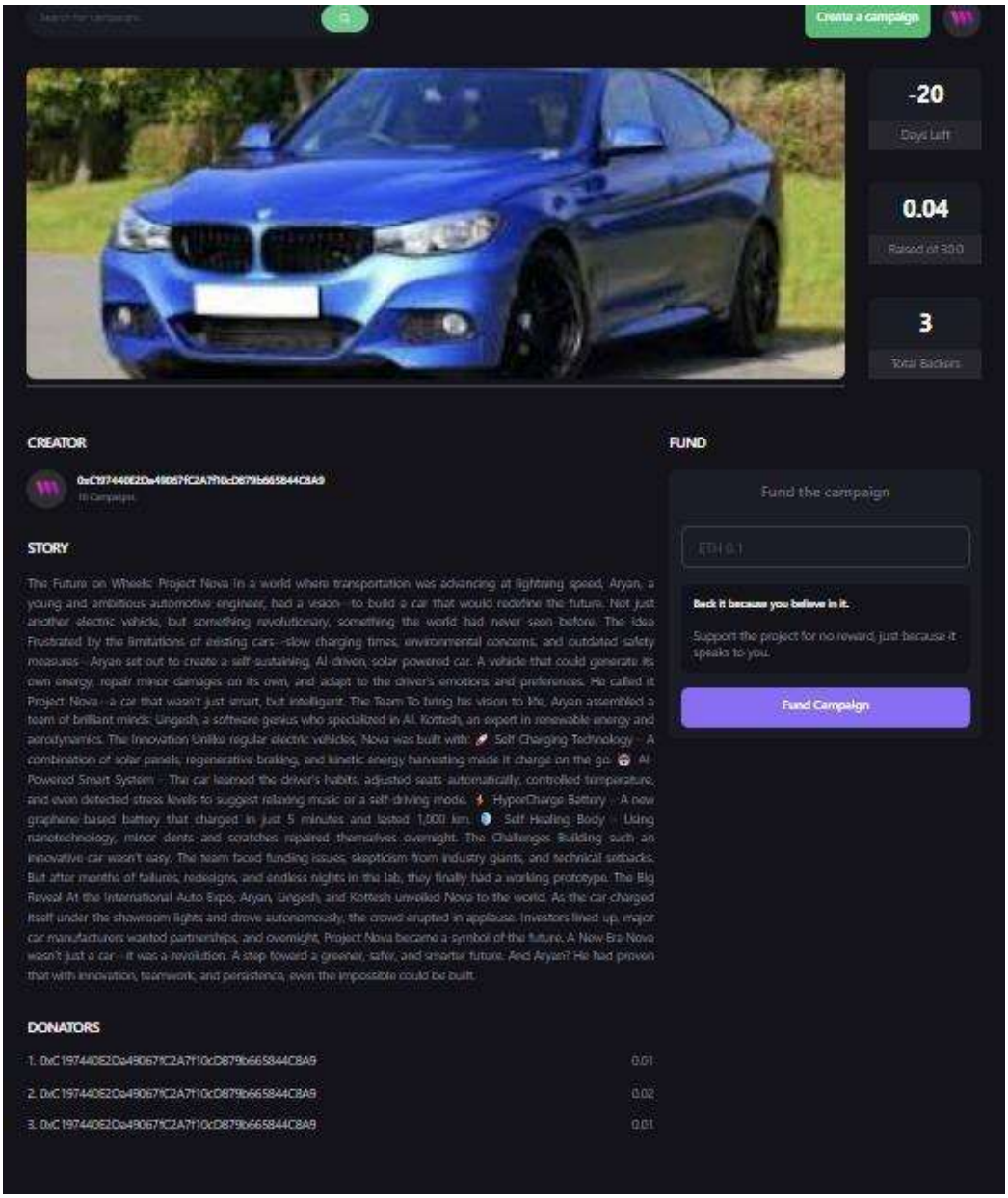

Fig 7:Campaign Details with Transactions and Backers count

CHAPTER 7
CONCLUSION

The integration of blockchain technology into crowdfunding has the potential to revolutionize the way fundraising is conducted, offering transparency, security, and decentralization. By leveraging smart contracts, decentralized finance (DeFi) mechanisms, and token-based governance, blockchain-based crowdfunding platforms can eliminate intermediaries, reduce fraud, and enhance trust between project creators and backers.

The proposed platform aims to address the limitations of traditional crowdfunding models by implementing automated funding mechanisms, milestone-based fund releases, and decentralized decision-making processes. Additionally, incorporating user-friendly design elements, seamless wallet integrations, and lower transaction costs can significantly improve adoption rates and usability.

Despite these advantages, challenges such as regulatory compliance, security risks, and user adoption barriers remain key concerns. Future advancements in layer-2 scaling solutions, enhanced smart contract auditing, and regulatory frameworks will play a crucial role in further refining blockchain-based crowdfunding models.

In conclusion, the development of a secure, efficient, and user-friendly blockchain crowdfunding platform represents a significant step forward in democratizing access to funding. By continuously innovating and adapting to technological advancements, such platforms can empower entrepreneurs, creators, and investors worldwide, ensuring a more inclusive and transparent financial ecosystem.

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