

Blockchain-Based Decentralized Crowdfunding Application

Prabesh Tandukar

Submission Date: August, 2024

Yoobee College

907 Industry-based Capstone Research Project

Abstract

A brief overview of the project, including the problem statement, objectives, methodology, and expected outcomes.

Contents

Abstract	1
1 Introduction	3
1.1 Background	3
1.1.1 How Crowdfunding Works:	3
1.1.2 Types of Crowdfunding:	4
1.2 Blockchain Technology in Crowdfunding	4
1.2.1 Advantages of Blockchain in Crowdfunding	4
1.3 Problem Statement	5
1.4 Objectives	6
2 Literature Review	7
2.1 Existing Solutions	7
2.1.1 Traditional Crowdfunding Platforms in New Zealand:	7
2.2 Gaps in Research	10
2.3 Theoretical Framework	10
3 Project Description	11
3.1 System Overview	11
3.2 Key Features	11
3.2.1 Smart Contracts	11
3.2.2 User Interface	11
3.2.3 Security Measures	11
3.3 Technology Stack	11
4 Research Methodology	12
4.1 Research Design	12
4.2 Data Collection	12

4.2.1	Quantitative Methods	12
4.2.2	Qualitative Methods	12
4.3	Case Study	12
5	Implementation Plan	13
5.1	Development Phases	13
5.1.1	Phase 1: System Design and Architecture	13
5.1.2	Phase 2: Smart Contract Development	13
5.1.3	Phase 3: User Interface and Backend Development	13
5.1.4	Phase 4: Integration and Testing	13
5.2	Timeline	13
6	Evaluation and Testing	14
6.1	Evaluation Metrics	14
6.2	Testing Strategy	14
6.3	Compliance	14
7	Expected Outcomes	15
7.1	Impact	15
7.2	Scalability	15
8	Conclusion	16
9	References	17
	References	17
A	Appendix A: System Architecture Diagrams	19
B	Appendix B: Survey or Interview Questions	20
C	Appendix C: Additional Technical Details or Code Snippets	21

Chapter 1

Introduction

1.1 Background

Discuss the importance of crowdfunding and the role of blockchain technology in transforming this industry.

Crowdfunding is a way people to raise money for their projects and ideas by collecting small amounts of money from many individuals, usually through the internet. It helps creators, entrepreneurs, or organizations to get financial support without having to rely on traditional banks and investors.(Investopedia, 2023)

1.1.1 How Crowdfunding Works:

1. **Project Creation:** Someone with an idea or project creates a campaign on a crowdfunding platform and explains the reason they need the fund and how it will benefit others.(Investopedia, 2023)
2. **Setting Goals:** Usually, every campaign has a financial goal which is a amount of money to be raised within a specific time frame.(Investopedia, 2023)
3. **Rewards Or Equity:** Depending upon the type of crowdfunding, backers may receive rewards (like products or experiences) or equity (a share in the business) in return for their support.(Investopedia, 2023)
4. **Promotion:** The creator will promote their campaign through various channels like social media, emails to reach potential backers.(Investopedia, 2023)
5. **Funding:** If enough people fund the campaign and the funding goal is met, the creator will receive the fund to move forward. If the goal is not reached, sometimes

the money is returned to the backers.(Investopedia, 2023)

1.1.2 Types of Crowdfunding:

- **Reward-based:** Backers will receive rewards for their contribution, like a product or service.(Legalvision, 2024)
- **Equity-based:** Backers receive a share of the company in exchange for their investment.(Legalvision, 2024)
- **Donation-based:** People give money without expecting anything in return, often for charitable causes.(Legalvision, 2024)
- **Lending-based:** Backers lend money to individuals or businesses with the expectation of being paid back with interest.(Legalvision, 2024)

1.2 Blockchain Technology in Crowdfunding

Blockchain technology introduces a decentralized approach to crowdfunding, eliminating the need for intermediaries. By leveraging a distributed ledger, blockchain enables secure, transparent, and tamper-proof transactions. This ensures that all parties involved in the crowdfunding process can trust the system without the need for a central authority.

1.2.1 Advantages of Blockchain in Crowdfunding

- **Decentralization:** Blockchain removes the need for a central authority, allowing for more direct interaction between project creators and backers.
- **Transparency:** All transactions are recorded on a public ledger, providing real-time visibility into fund management and reducing the risk of fraud.
- **Security:** The use of cryptographic algorithms ensures that all transactions are secure and immutable, protecting against unauthorized changes or hacks.
- **Lower Transaction Fees:** By cutting out intermediaries, blockchain-based platforms can significantly reduce the transaction fees associated with crowdfunding.

-
- **Global Accessibility:** Blockchain allows for cross-border transactions without the need for currency conversions or international banking processes, making crowdfunding more accessible worldwide.

1.3 Problem Statement

Crowdfunding has become a vital tool for startups, social causes, and creative projects, enabling them to raise funds directly from the public through online platforms. Traditional crowdfunding platforms such as Kickstarter, GoFundMe, and Indiegogo have played a significant role in this space, offering a centralized system for campaign management and fund collection.

However, these traditional platforms exhibit several limitations that can hinder the effectiveness and fairness of the crowdfunding process. Centralization allows platform operators to exert significant control over campaigns, including the imposition of fees, policy changes, or even the suspension of campaigns. This centralization limits the autonomy of project creators and introduces single points of failure.

Transparency is another critical issue in current crowdfunding models. Backers often lack real-time visibility into how their contributions are being used, leading to concerns about fund mismanagement or fraud. The centralized nature of these platforms also means that they are vulnerable to security breaches and fraudulent campaigns.

Furthermore, traditional platforms impose significant fees, which reduce the funds available for project creators. These fees, combined with limited access to global participants due to regulatory and payment system barriers, restrict the potential reach of crowdfunding campaigns.

Current blockchain-based crowdfunding platforms attempt to address some of these issues but still face challenges related to usability, accessibility, and adoption. Many existing solutions are either too complex for the average user or fail to provide the level of transparency and security that backers and project creators require.

This project aims to address the gap in decentralization, transparency, and trust by developing a blockchain-based crowdfunding platform. The proposed platform will

eliminate the need for a central authority, provide real-time visibility of fund management through a public ledger, and enhance security and trust through the use of smart contracts. By offering global accessibility with lower transaction fees and customizable funding structures, this project seeks to overcome the limitations of both traditional and existing blockchain-based crowdfunding models, paving the way for a more inclusive and trustworthy crowdfunding ecosystem.

1.4 Objectives

The primary objectives of this project are as follows:

- **Develop a Decentralized Crowdfunding Platform:** Design and implement a blockchain-based crowdfunding platform that operates without a central authority, enabling project creators to manage their campaigns autonomously.
- **Enhance Transparency and Trust:** Utilize blockchain technology to provide real-time transparency of fund allocation and usage, ensuring that backers can track their contributions throughout the campaign lifecycle.
- **Reduce Transaction Fees:** Lower the transaction costs associated with crowdfunding by leveraging smart contracts and decentralized payment systems, making the platform more accessible to a global audience.
- **Improve Security and Fraud Prevention:** Integrate smart contracts and decentralized identity management to enhance security measures, reducing the risk of fraud and ensuring that funds are used as intended.
- **Increase Accessibility and Usability:** Design an intuitive user interface and user experience (UI/UX) that caters to both tech-savvy users and those with minimal blockchain experience, broadening the platform's user base.
- **Global Reach and Inclusion:** Ensure the platform is accessible to users worldwide, overcoming geographical barriers imposed by traditional platforms and fostering financial inclusion.

Chapter 2

Literature Review

2.1 Existing Solutions

Review traditional and blockchain-based crowdfunding platforms.

2.1.1 Traditional Crowdfunding Platforms in New Zealand:

1. PledgeMe:

Operational Model: PledgeMe offers both reward-based and equity-based crowdfunding. For reward-based campaigns, project creators offer rewards in exchange for contributions. For equity based campaigns, backers receive shares in the company.(PledgeMe, 2024)

Impact: PledgeMe helps project creators by providing a platform to reach potential backers and raise the necessary funds. It also offers a way for backers to support projects they believe in, either by receiving rewards or gaining equity in a company.(PledgeMe, 2024)

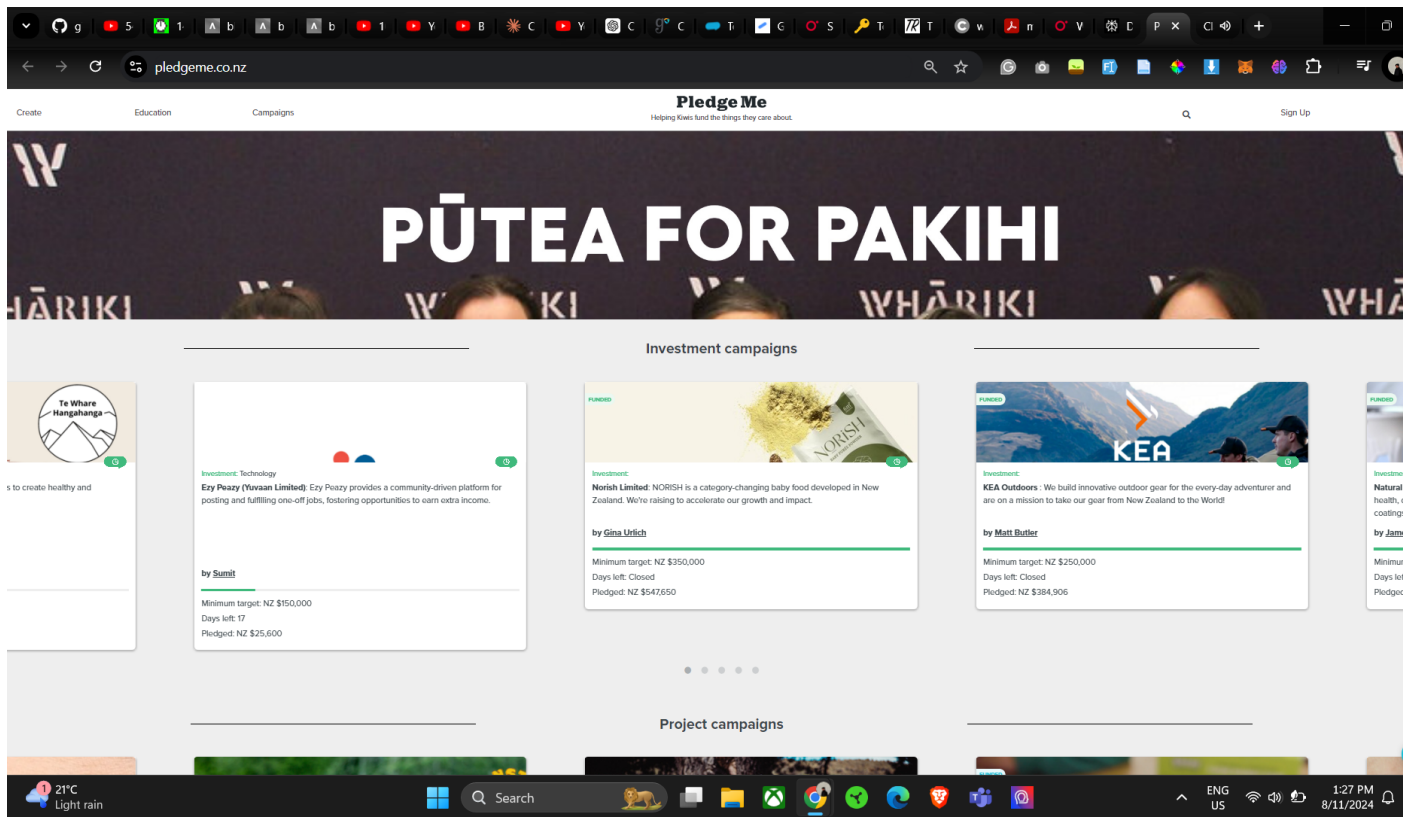


Figure 2.1: Pledge Me Home Page Investment Campaigns.

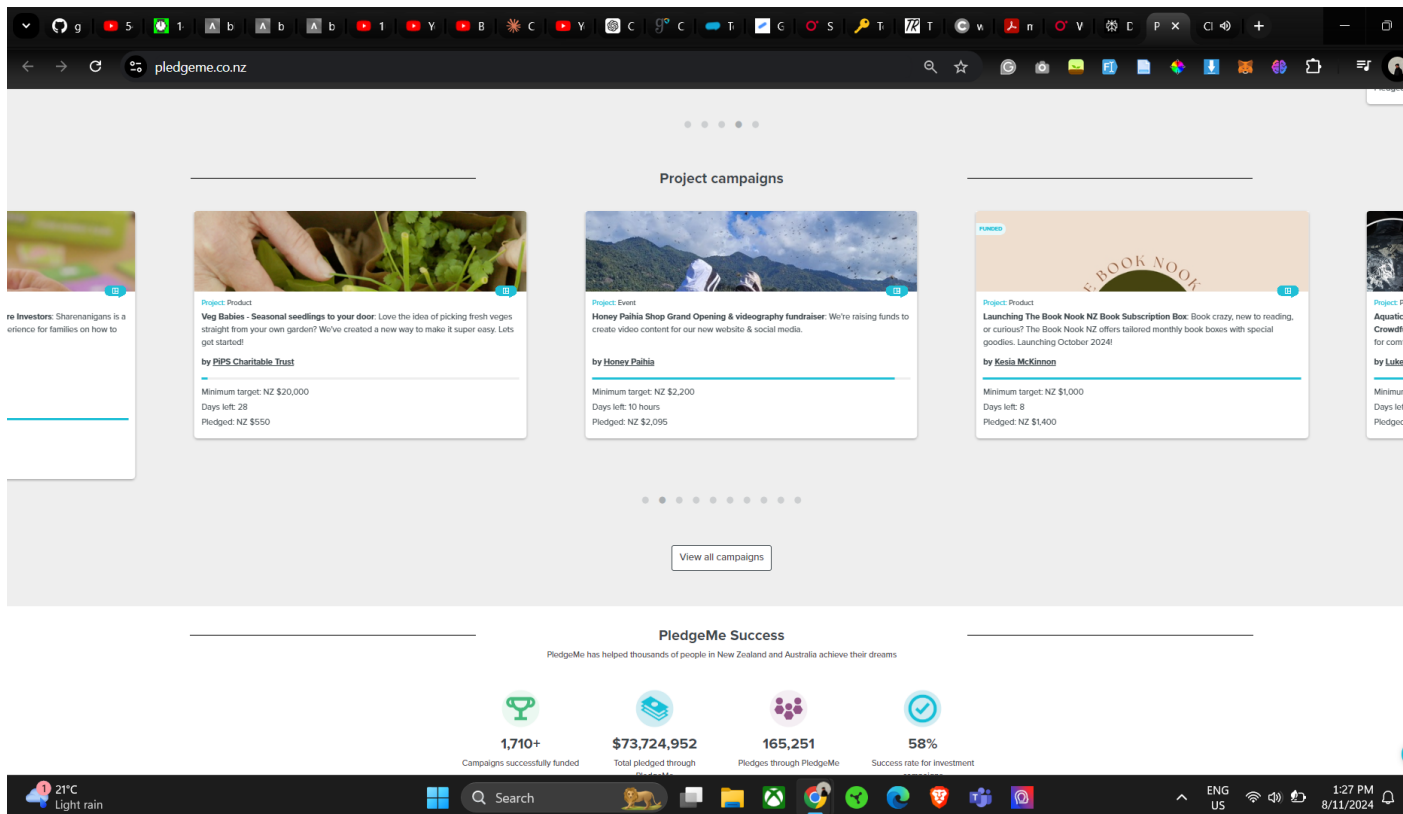


Figure 2.2: Pledge Me Home Project Campaigns.

Snowball Effect:

Operational Model: Snowball Effect is primarily an equity crowdfunding platform. It allows companies to raise capital by offering shares to the public. This platform is used by companies at various growth stages, from startups to more mature businesses looking for expansion capital.(SnowballEffect, 2024)

Impact: For project creators, Snowball Effect provides access to a wide investor audience and simplifies the process of raising funds. For investors, it offers opportunities to invest in private companies and potentially gain significant returns.(SnowballEffect, 2024)

2.2 Gaps in Research

Identify gaps, such as security vulnerabilities, trust issues, or limitations in user control, that your project will address.

2.3 Theoretical Framework

Provide a framework or models that will guide your research and development process.

Chapter 3

Project Description

3.1 System Overview

Describe the overall architecture of the decentralized crowdfunding platform.

3.2 Key Features

3.2.1 Smart Contracts

How they will automate and secure transactions.

3.2.2 User Interface

How users will interact with the platform.

3.2.3 Security Measures

Blockchain's role in enhancing security and trust.

3.3 Technology Stack

Specify the technologies, programming languages, and blockchain platform you will use.

Chapter 4

Research Methodology

4.1 Research Design

Describe the methodology for analyzing the problem and designing the solution.

4.2 Data Collection

4.2.1 Quantitative Methods

Metrics from existing platforms.

4.2.2 Qualitative Methods

Surveys, interviews with users, and experts.

4.3 Case Study

Outline a hypothetical crowdfunding campaign to demonstrate your platform's functionality.

Chapter 5

Implementation Plan

5.1 Development Phases

5.1.1 Phase 1: System Design and Architecture

5.1.2 Phase 2: Smart Contract Development

5.1.3 Phase 3: User Interface and Backend Development

5.1.4 Phase 4: Integration and Testing

5.2 Timeline

Provide a Gantt chart or timeline for the project's milestones.

Chapter 6

Evaluation and Testing

6.1 Evaluation Metrics

Identify the KPIs (e.g., transaction speed, security incidents, user satisfaction).

6.2 Testing Strategy

Explain how you will test the platform, including beta testing with real users.

6.3 Compliance

Ensure the solution meets industry standards and regulatory requirements.

Chapter 7

Expected Outcomes

7.1 Impact

Describe the potential impact of the project on the crowdfunding industry.

7.2 Scalability

Discuss how the platform can be scaled to accommodate more users and campaigns.

Chapter 8

Conclusion

Recap the problem, solution, and expected outcomes. Suggest potential future enhancements or research directions.

Chapter 9

References

Bibliography

Investopedia. (2023). Crowdfunding [Accessed: 2024-08-11]. <https://www.investopedia.com/terms/c/crowdfunding.asp>

Legalvision. (2024). Types of crowdfunding [Accessed: 2024-08-11]. <https://legalvision.com.au/types-of-crowdfunding/>

PledgeMe. (2024). Pledgeme [Accessed: 2024-08-11]. <https://www.pledgeme.co.nz/>

SnowballEffect. (2024). Snowballeffect [Accessed: 2024-08-11]. <https://www.snowballeffect.co.nz/>

Appendix A

Appendix A: System Architecture Diagrams

Include detailed diagrams (e.g., system architecture, data flow).

Appendix B

Appendix B: Survey or Interview Questions

Survey or interview questions if applicable.

Appendix C

Appendix C: Additional Technical Details or Code Snippets

Additional technical details or code snippets.