DECENTRALIZED WEB-HOSTING SYSTEM

A Project Report

Submitted by

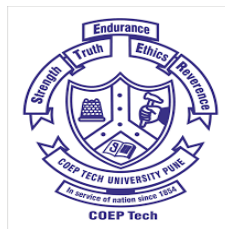|	
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TY (Computer Engineering)

Under the guidance of

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COEP Technological University

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COEP Technological University

April, 2024

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COEP Technological University

CERTIFICATE

Certified that this project, titled "RETAIL E-COMMERCE PRICE TRACKER" has

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Project- Stage II".

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Project Guide

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Abstract

Crowdfunding platforms have revolutionized the way individuals and businesses raise funds for their projects, ventures, and causes. Traditionally, these platforms operate in a centralized manner, often subject to the regulations and restrictions imposed by financial institutions and government bodies. However, exploring decentralized networks for crowdfunding introduces several potential advantages, including increased transparency, reduced fees, and enhanced security. This study aims to investigate the feasibility and potential benefits of a decentralized crowdfunding platform. By leveraging blockchain technology, smart contracts, and decentralized finance (DeFi) protocols, the proposed platform seeks to democratize access to capital while mitigating the risks associated with centralized intermediaries. Through a comparative analysis with traditional crowdfunding platforms, this research evaluates the scalability, security, and accessibility of the proposed decentralized solution. By conducting empirical testing and simulations, we aim to identify potential security vulnerabilities and assess the platform's overall performance. The findings of this study contribute to the growing body of research on decentralized finance and blockchain applications in the realm of crowdfunding. Insights gained from this research may inform the development of more resilient and inclusive crowdfunding ecosystems, empowering individuals and communities worldwide to finance their projects autonomously and securely

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Synopsis

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Dr. Tanuja R. Pattanshetti

1.3 Problem Statement

Existing crowdfunding platforms suffer from centralization, leading to issues like high fees, lack of transparency, and susceptibility to censorship. To counter these challenges, a decentralized crowdfunding platform using blockchain, smart contracts, Node.js, and Solidity is needed. This requires addressing technical challenges like smart contract design, scalability, and regulatory compliance, while also fostering a robust developer community for sustainability and adoption. The goal is to create a more secure, transparent, and inclusive crowdfunding ecosystem.

1.4 Plan of Project Execution

Task	Start Date	End Date	Duration	Resources
Problem statement finalization	08-Jan-24	15-Jan-24	8	Hariom and Shrikant
Project Plan	16-Jan-24	31-Jan-24	16	Shrikant
Research	01-Feb-24	05-Feb-24	5	Hariom
Requirement Analysis	06-Feb-24	09-Feb-24	4	Both
Architectural Design	10-Feb-24	13-Feb-24	4	Hariom
User-Interface Design	13-Feb-24	18-Feb-24	6	Shrikant
Security Design	19-Feb-24	29-Feb-24	10	Shrikant
Prototyping	01-Mar-24	10-Mar-24	10	Both
Backend Development	11-Mar-24	20-Mar-24	10	Both
Frontend	21-Mar-24	31-Mar-24	10	Both
Testing	01-Apr-24	10-Apr-24	10	Both
Documentation and project report	11-Apr-24	15-Apr-24	5	Both

Chapter 2

Problem Definition and scope

Goals:

    Develop a decentralized crowdfunding platform to enhance transparency, security, and inclusivity in fundraising.

Objectives:

    Enable project creators to raise funds without relying on centralized crowdfunding platforms.

    Foster a community-driven approach to crowdfunding, empowering backers and creators alike.

    Provide tools for project creators to manage and customize their campaigns effectively.

    Ensure compliance with regulatory standards while promoting innovation in decentralized finance (DeFi) and tokenization.

Statement of Scope:

    Target Products: Decentralized crowdfunding platform, Smart contract infrastructure, Blockchain-based fundraising tools.

    Target Projects: Various crowdfunding campaigns including creative projects, startups, charitable initiatives, and social causes.

    Target Audience: Individuals, entrepreneurs, startups, non-profits, and organizations seeking funding for their projects or ventures. Developers interested in building decentralized applications (dApps) leveraging crowdfunding functionalities

2.1 Software context

The Crowdfunding Platform project operates within the domain of blockchain technology and decentralized systems. It integrates blockchain protocols for secure and transparent transactions, utilizing Solidity for smart contract development and JavaScript for frontend interfaces. Smart contracts automate crowdfunding agreements, eliminating intermediaries. The platform leverages decentralized finance (DeFi) protocols for asset tokenization and peer-to-peer transactions, and utilizes IPFS for decentralized storage of campaign-related content, ensuring data integrity and accessibility. Overall, the project aims to create a transparent, secure, and inclusive crowdfunding environment powered by blockchain technology.

2.2 Major Constraints:

- Regulatory Compliance: Addressing legal and regulatory challenges associated with crowdfunding, including compliance with financial regulations and data protection laws.
- Platform Security: Ensuring the security of the crowdfunding platform to protect against fraudulent activities, hacking, and data breaches.
- User Trust: Building trust among users by implementing transparent processes, protecting investors' interests, and ensuring the integrity of fundraising campaigns.
- Scalability: Overcoming scalability challenges to accommodate a growing number of projects and users without compromising performance.
- Interoperability: Ensuring compatibility and interoperability with existing financial systems and platforms to facilitate seamless integration and adoption.

2.3 Outcome:

The primary outcome of the Crowdfunding Platform project is the development of a reliable and user-friendly platform for conducting crowdfunding campaigns. Key components of the outcome include:

- Transparent and Secure Transactions: Implementing transparent and secure transaction mechanisms powered by blockchain technology to enhance trust among users.
- Efficient Fundraising Tools: Providing efficient tools and interfaces for project creators to launch and manage crowdfunding campaigns seamlessly.
- Regulatory Compliance Framework: Establishing a robust regulatory compliance framework to ensure adherence to relevant laws and regulations.
- Increased Accessibility: Improving accessibility to crowdfunding opportunities for both project creators and investors, fostering inclusivity and diversity.
- Community Engagement: Promoting active community participation through governance mechanisms and incentivization strategies to ensure platform sustainability and growth.

2.2 Applications:

- Crowdfunding Platform: Facilitates fundraising campaigns for individuals and organizations in a decentralized manner, reducing reliance on traditional intermediaries and promoting transparency in fundraising activities.
- Tokenization of Assets: Enables project creators to tokenize assets, offering digital tokens representing ownership or rights in their ventures, thereby broadening access to investment opportunities.
- Community Engagement: Empowers backers to participate in project decision-making processes through decentralized governance mechanisms, fostering community involvement and transparency.
- Innovation in Finance: Supports innovation in decentralized finance (DeFi) by providing a platform for experimenting with new fundraising models such as token sales, initial coin offerings (ICOs), and decentralized autonomous organizations (DAOs).

2.3 Software Resources Required:

1. Blockchain Platform: Utilize blockchain platforms such as Ethereum or Binance Smart Chain for transparent and secure transaction processing.
2. Smart Contract Development Tools: Employ tools for developing smart contracts, including languages like Solidity and development environments like Remix.
3. Frontend Development Tools: Utilize JavaScript frameworks like React.js or Angular for building user interfaces and frontend components to interact with the crowdfunding platform.
4. Decentralized Finance (DeFi) Protocols: Integrate with DeFi protocols to enable tokenization of assets and facilitate peer-to-peer transactions.
5. Secure Authentication Mechanisms: Implement secure authentication mechanisms, such as decentralized identity solutions like Metamask or WalletConnect, to ensure user privacy and security.

Chapter 3

Project Plan

3.1   Project Schedule

3.1.1   Gantt Chart
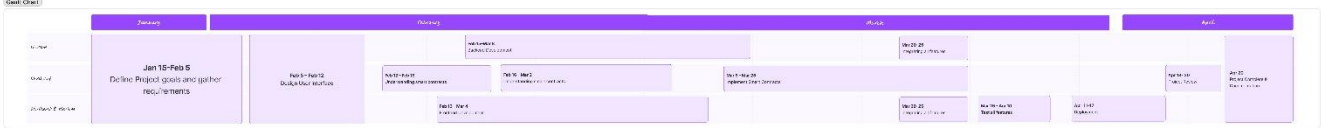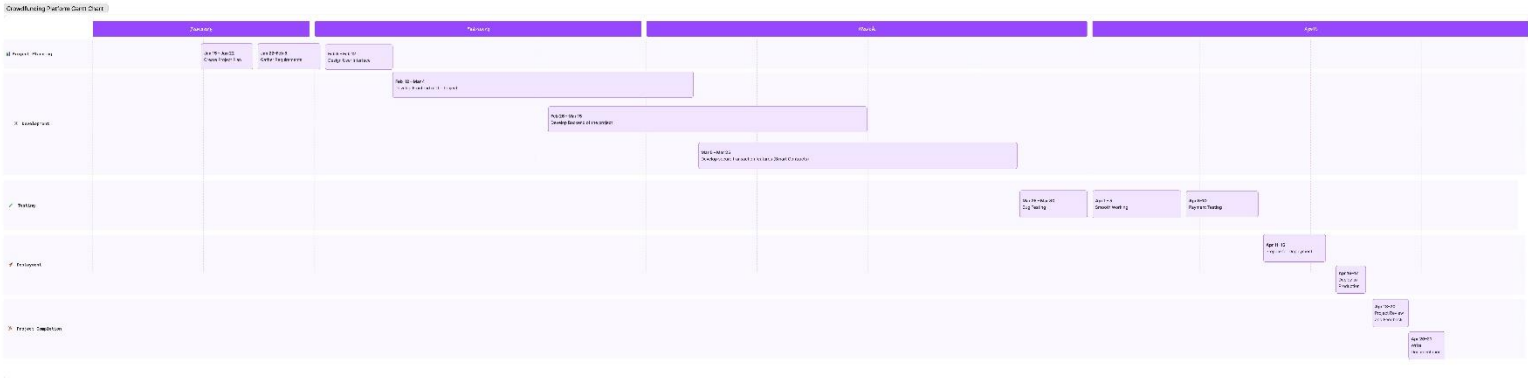
Chapter 4

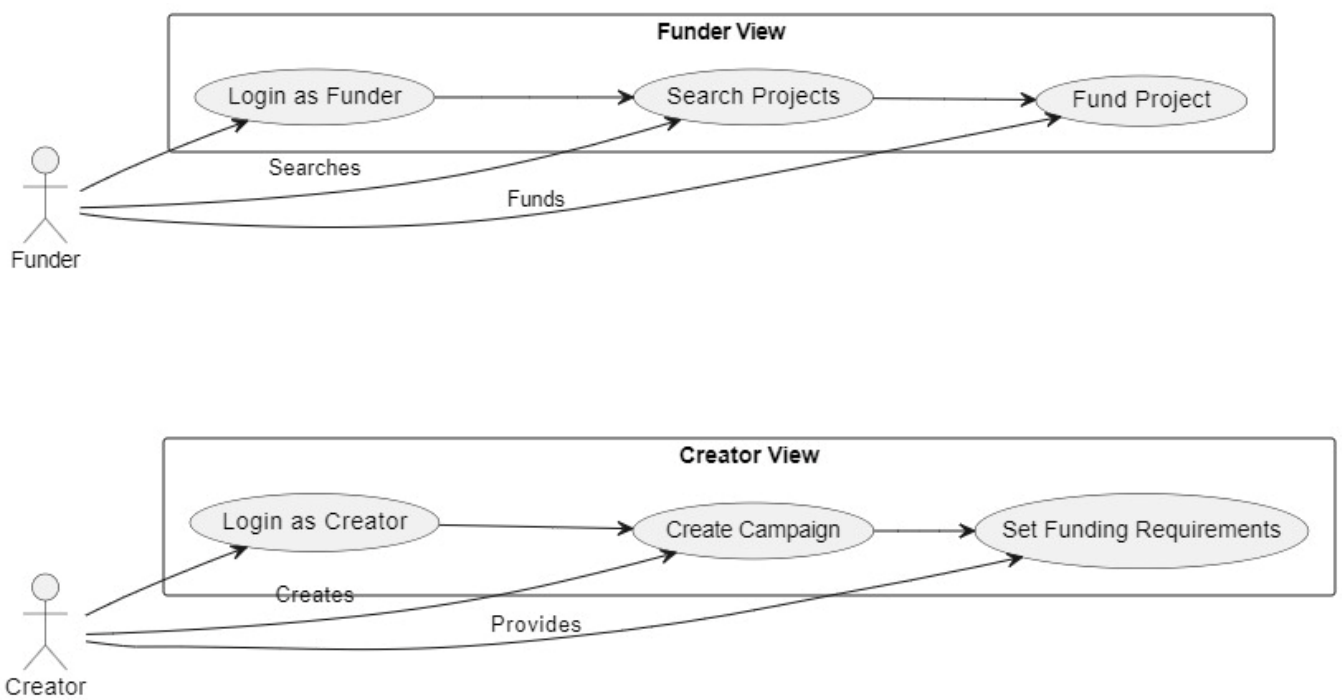# Software requirement specification

4.1 Introduction

4.1.1 Use-cases:

1. User Registration: Users sign up for an account on the crowdfunding platform by providing necessary information such as name, email, and password. Upon registration, the platform generates a unique user identifier.

2. Password Reset: Users can reset their password by initiating a password reset request through the platform.

3. Project Creation: Project creators initiate crowdfunding campaigns by providing details about their project, including title, description, funding goal, and duration.

4. Smart Contracts: Smart contracts manage crowdfunding campaigns, automating processes such as fund allocation, reward distribution, and project verification.

5. Contribution: Backers contribute funds to support crowdfunding campaigns by selecting a project and specifying the amount they wish to contribute.

6. Reward Redemption: Project creators fulfill their commitments by providing rewards or incentives to backers based on predefined terms outlined in smart contracts.

7. Campaign Updates: Project creators provide updates on the progress of their campaigns, including milestones achieved, challenges faced, and future plans.

8. Investor Dashboard: Investors track their contributions, view project updates, and manage their portfolio through an intuitive dashboard interface.

9. Project Discovery: Users explore and discover new crowdfunding campaigns based on categories, popularity, and other relevant criteria.

10. Campaign Monitoring: Users monitor the performance of ongoing crowdfunding campaigns, including funds raised, time remaining, and backer engagement.
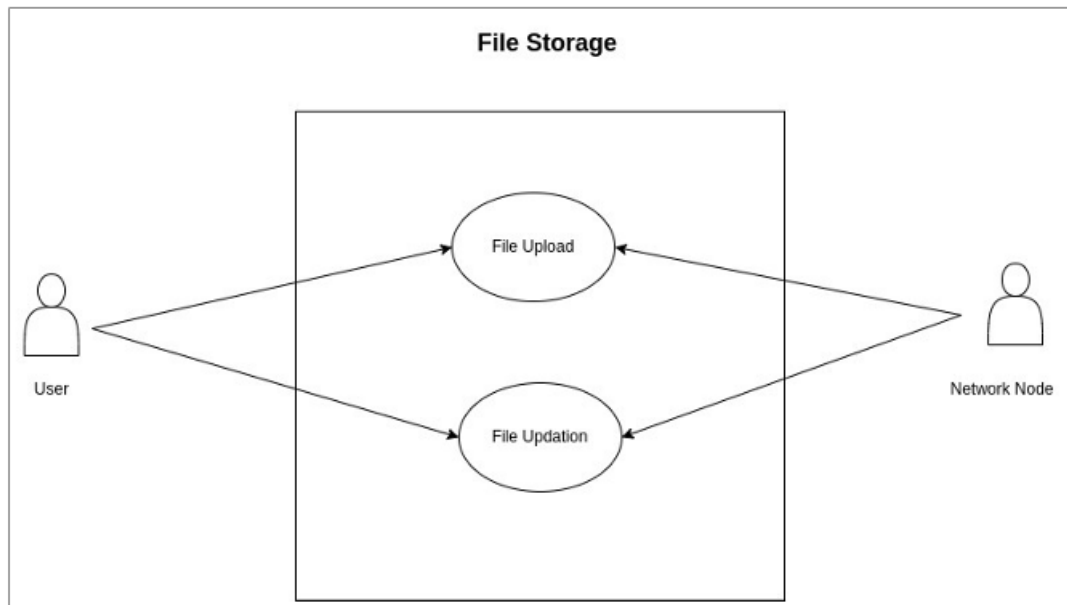.

4.1.1. Use Case View

Use Case Diagram:

Funder View

Login as Funder → Search Projects → Fund Project

Searches

Funds

Funder

Creator View

Login as Creator → Create Campaign → Set Funding Requirements

Creates

Provides

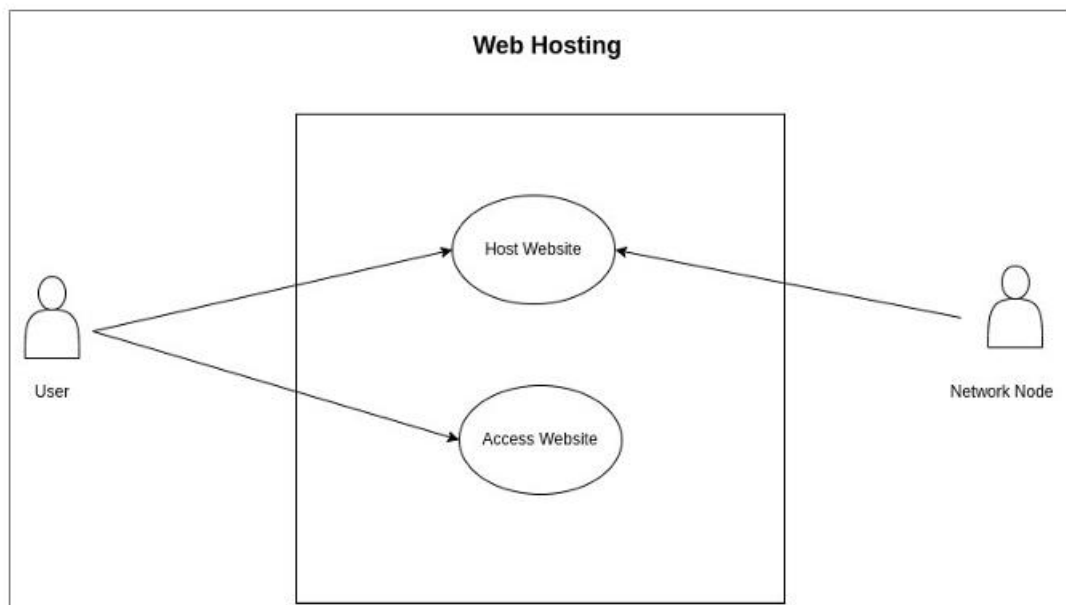Creator

Figure 4.2: User Case Diagram - File Storage

Figure 4.3: User Case Diagram - Web Hosting

4.2   Data Model and Description

4.2.1 Data Objects and Relationships :

1. User: Represents individuals or entities participating in the crowdfunding platform. Users register, authenticate, and engage in crowdfunding activities such as creating campaigns, contributing funds, and managing their accounts.

2. Project: Represents a crowdfunding campaign initiated by a user to raise funds for a specific venture or cause. Projects have attributes such as title, description, funding goal, duration, and current status.

3. Contribution: Records the contributions made by users to support crowdfunding projects. Each contribution includes details such as the amount contributed, the backer's information, and the associated project.

4. Reward: Represents incentives or benefits offered by project creators to backers in exchange for their contributions. Rewards may include tangible items, digital products, or special experiences.

5. Transaction: Records the financial transactions associated with crowdfunding activities, including contributions made by backers, withdrawals initiated by project creators, and any fees or charges incurred during the process.

6. Campaign Update: Represents updates provided by project creators to inform backers about

the progress of their campaigns. Campaign updates may include milestones achieved, project developments, challenges faced, and future plans.
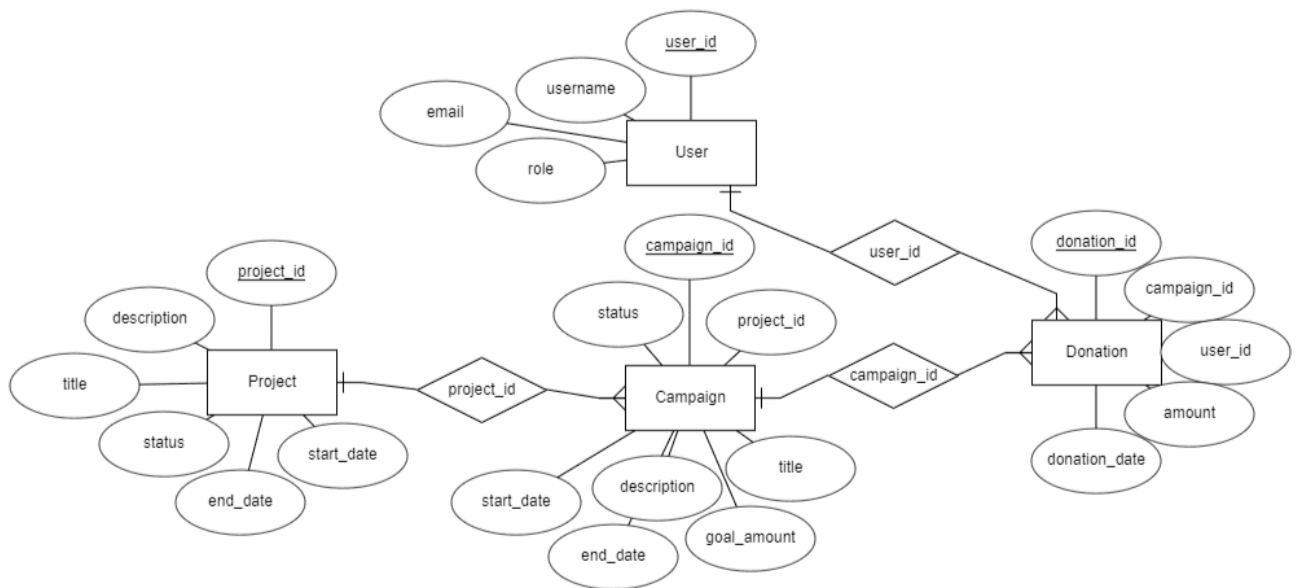
Entity Relationship Diagram:

Figure 4.4: Entity Relationship diagram

4.3 Functional Model and Description

4.3.1 Functional Requirements:

1. **Node Registration**: Nodes register on the platform by providing necessary information and authenticating their identity.

2. **Website Deployment**: Users deploy their websites on the platform, specifying hosting requirements.

3. **Content Verification**: Nodes verify hosted content integrity to prevent

tampering, ensuring website reliability.

4. User Authentication: Users securely authenticate to access hosting services and

manage their websites.

4.3.1 Data Flow Diagram

Level 0 Data Flow Diagram
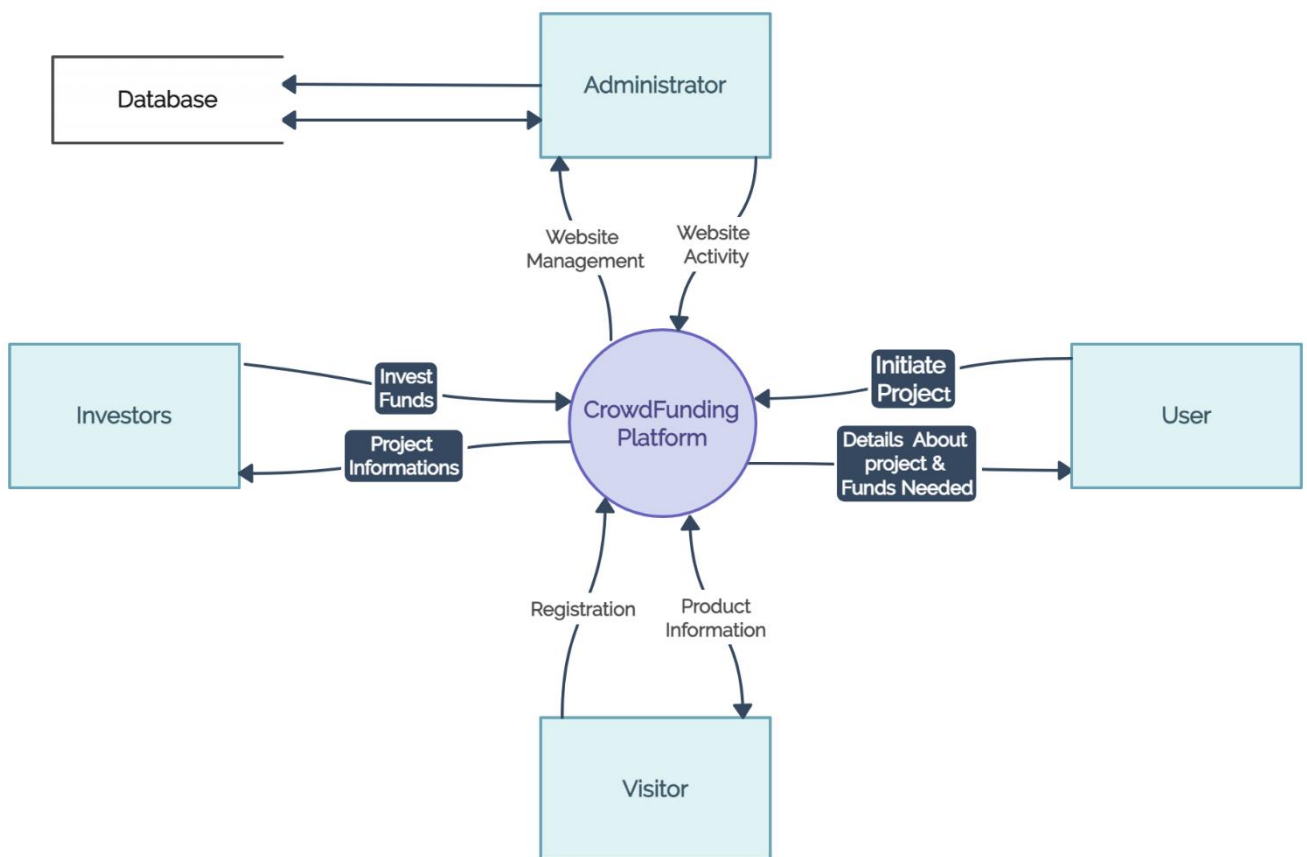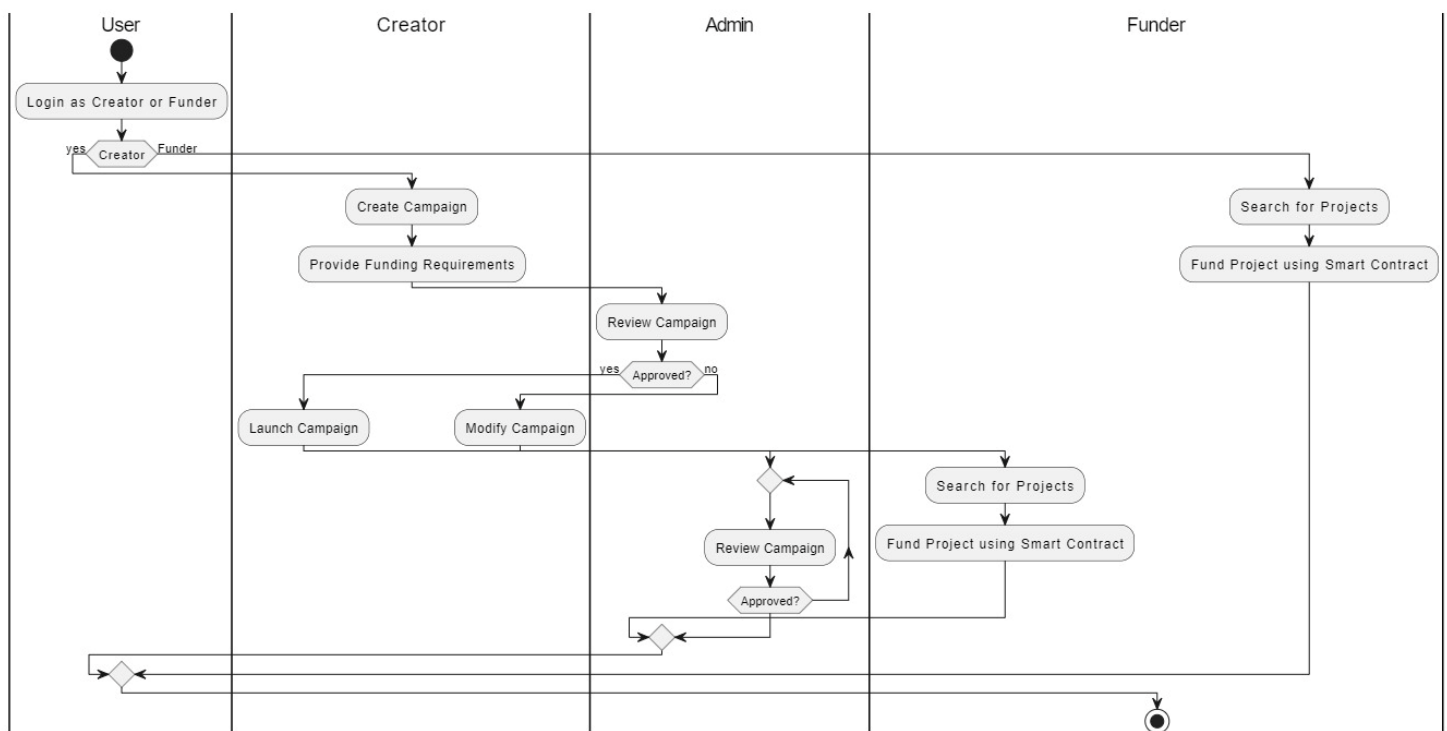

Figure 4.5: DFD Level0

Level 1 Data Flow Diagram

Level 1
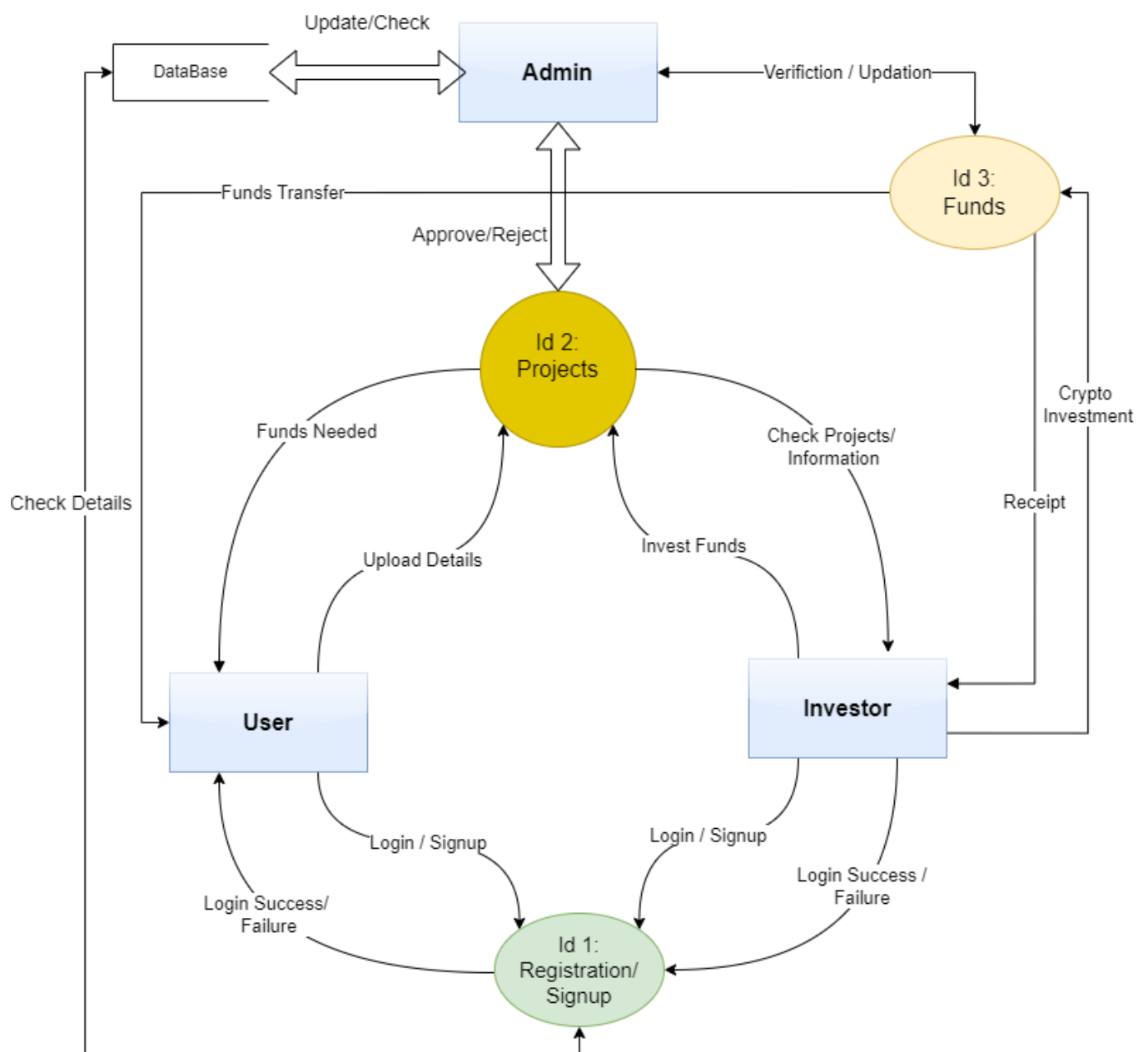
Figure 4.6: DFDLevel1

Level 2 Diagram
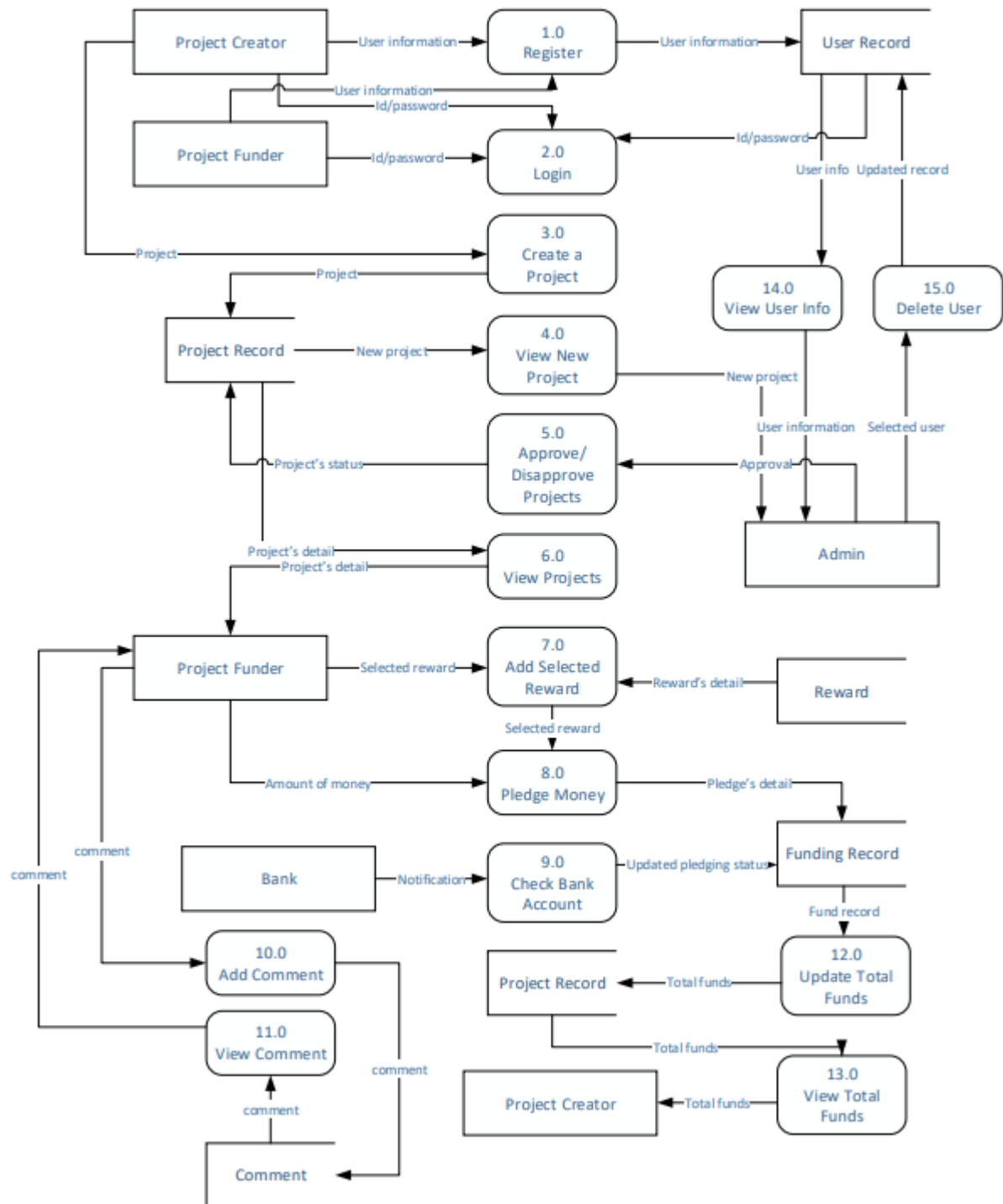
4.3.2 Description of functions:

4.3.3 Swimline Diagram :

4.3.5 Non-Functional Requirements:

Performance Requirements:

- **Response Time**: The crowdfunding platform should respond quickly to user interactions such as project creation, contribution, and updates.

- **Scalability**: The platform's infrastructure should be scalable to accommodate increasing user activity and project demand without degradation in performance.

- **Concurrency**: The system should support multiple concurrent interactions, allowing users to create, manage, and contribute to projects simultaneously without delays.

- **Error Handling**: The platform should effectively handle errors, providing informative feedback to users in case of failed transactions or system anomalies.

Safety and Security Requirements:

- **Data Privacy**: User data and transaction details should be securely stored and encrypted to prevent unauthorized access.

- **Content Integrity**: Project content should be verified to ensure accuracy and reliability, reducing the risk of fraudulent or misleading information.

4.3.6 Design Constraints:

Data Acquisition:

- **Adaptation to Network Changes**: The platform should adapt to changes in network conditions and user connectivity.

- **Compliance with Ethical Guidelines**: Data acquisition techniques must adhere to ethical standards and regulatory requirements.

Client-side Constraints:

- **Offline Access**: Users should have limited access to platform functionalities even when offline.

- **Data Synchronization**: Client-side and server-side data should synchronize to maintain consistency across different devices and sessions.

Data Processing:

- **Optimization of Performance**: Data processing should be optimized to handle increasing project activity efficiently without compromising platform performance.

Chapter 5

Detailed Design Document
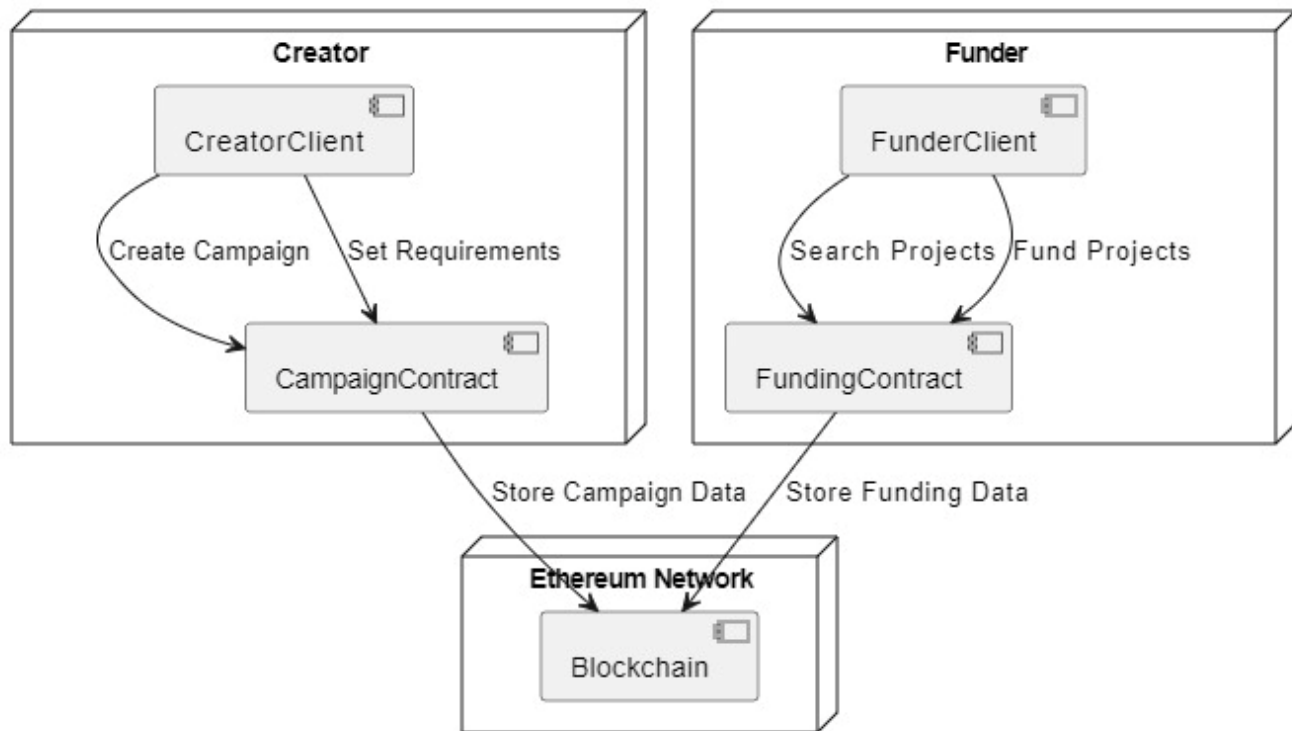
5.1 Component Design

5.1.1 Class Diagram:
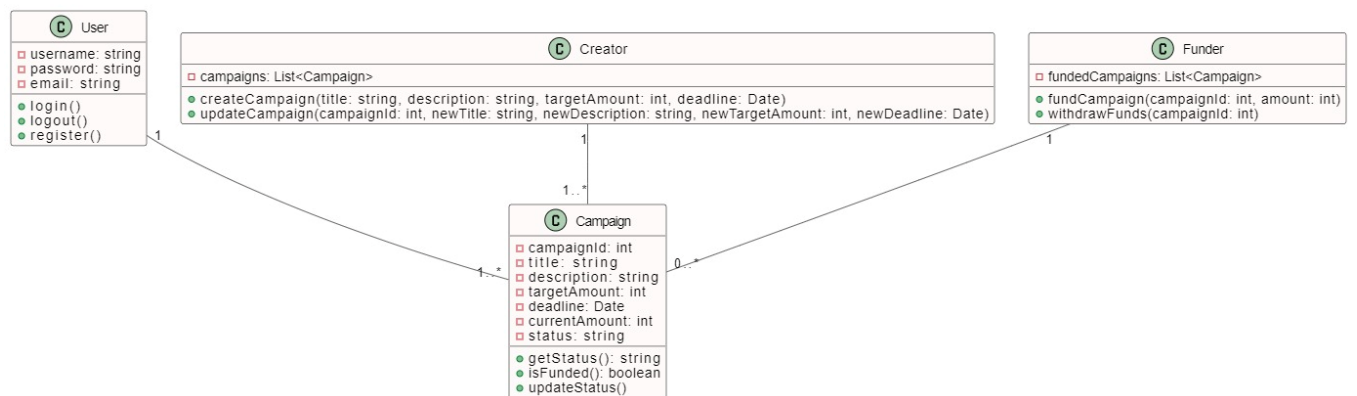
5.1.2 Sequence Diagram:
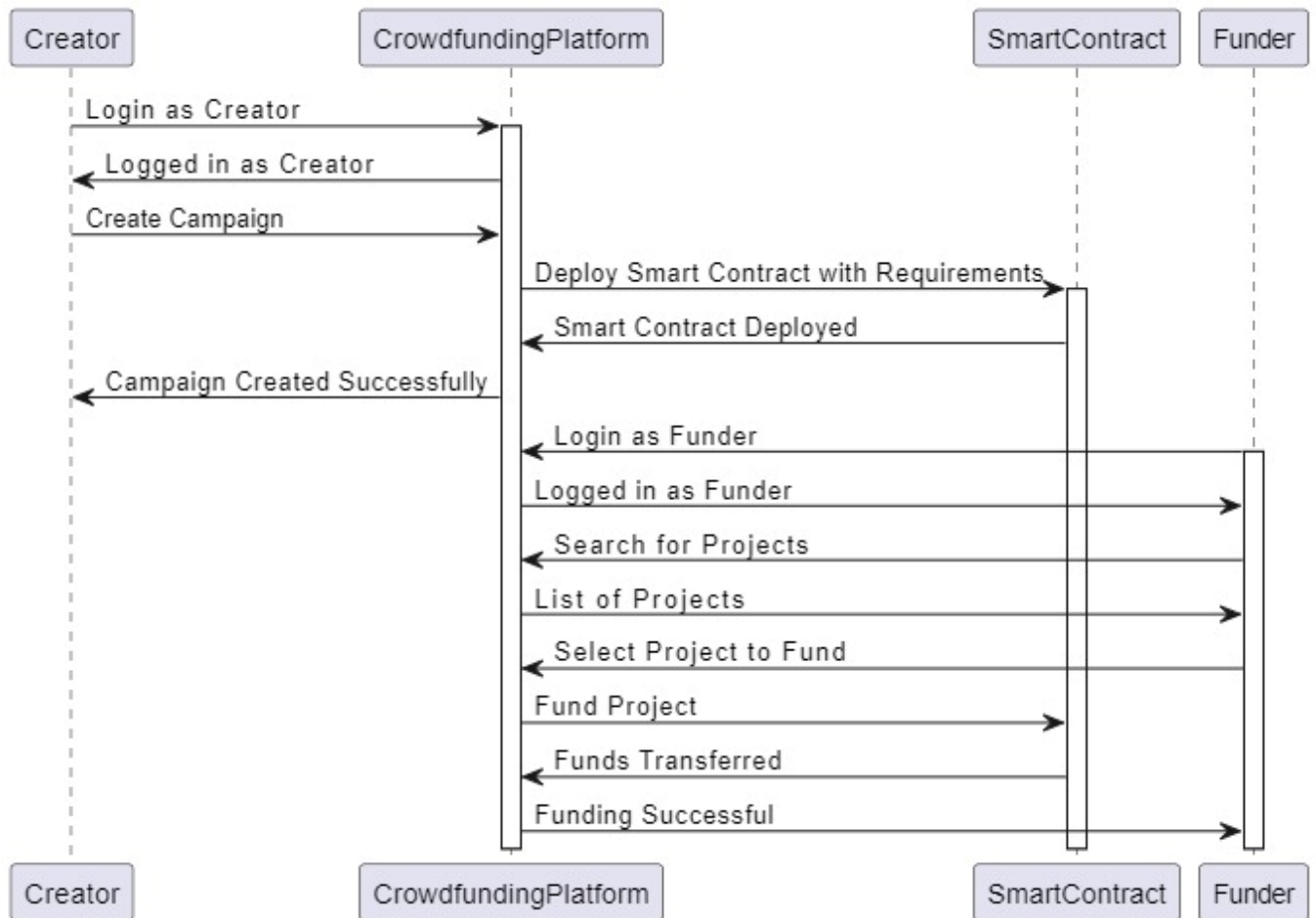
5.1.3 Component Diagram:
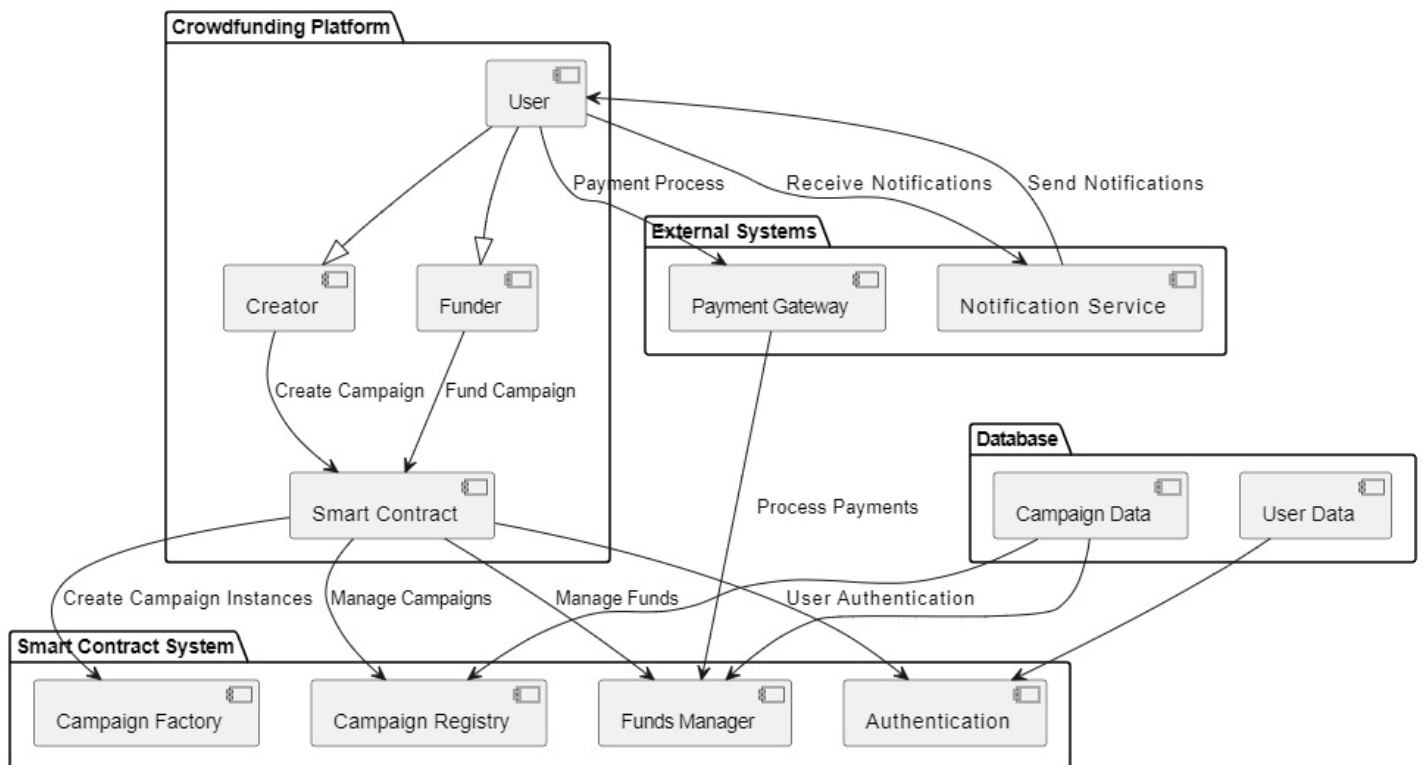
5.1.4 Deployment Diagram:

5.2 Navigation Flow:

5.2.1 Home Page:
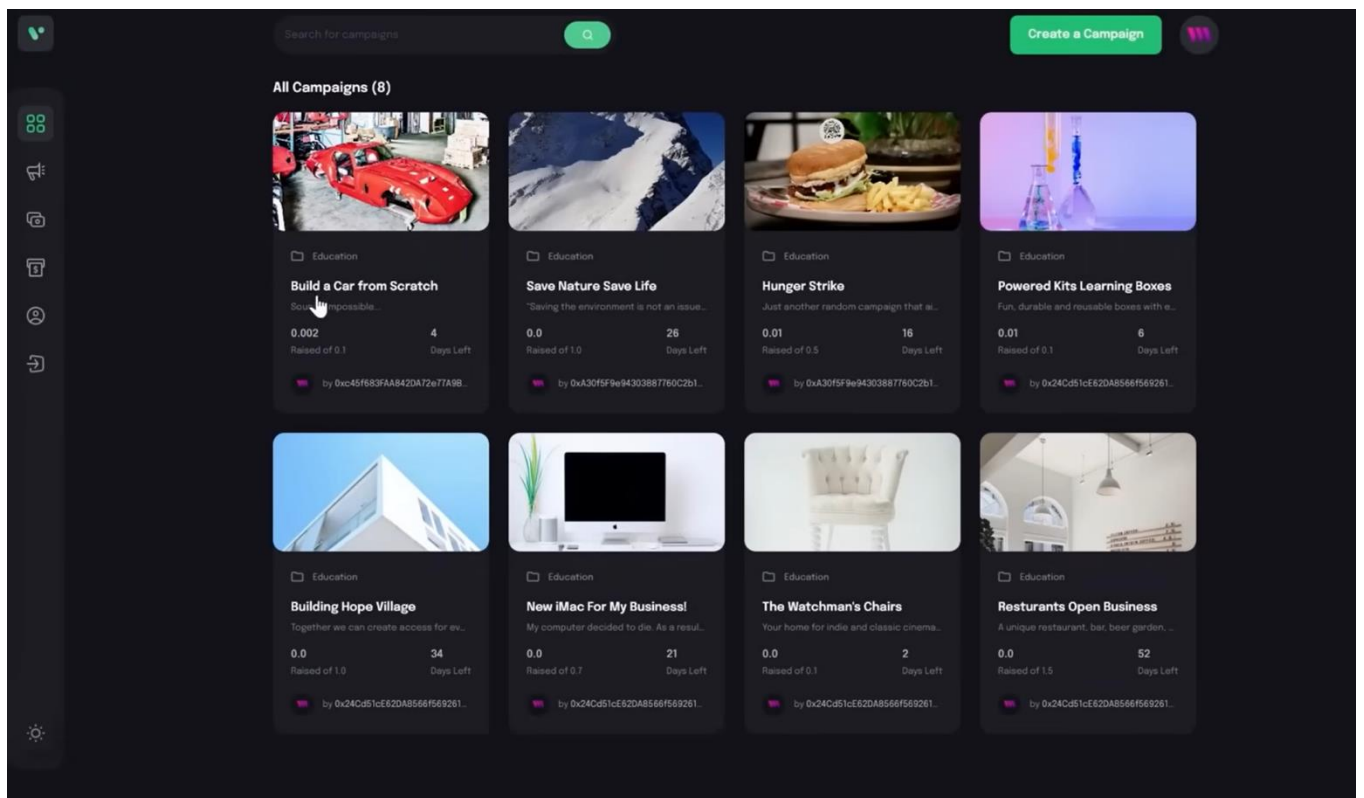
5.2.2 Create Campaign:

5.2.2 Campaign Info :

Chapter 6

Summary and Conclusion:

The developed crowdfunding platform offers users the capability to initiate and participate in crowdfunding campaigns in a decentralized manner. Leveraging blockchain technology, users can create projects, contribute funds, and manage their portfolios securely and transparently. Key components of the platform include smart contracts governing crowdfunding campaigns, project creation, and fund allocation.

Through extensive development and testing, the platform demonstrates efficient response times, scalability to accommodate increasing user and project demands, support for multiple concurrent interactions, and robust error handling mechanisms. By leveraging decentralized technologies, the platform provides users with a decentralized and transparent crowdfunding solution that ensures trust and reliability in the fundraising process.

In conclusion, the developed decentralized crowdfunding platform represents a significant advancement in fundraising solutions, offering users a decentralized alternative to traditional crowdfunding platforms. The platform's emphasis on security, transparency, scalability, and error handling ensures a seamless user experience while maintaining the integrity of crowdfunding campaigns. Moving forward, further enhancements and optimizations can be explored to improve platform features and address emerging challenges in decentralized crowdfunding. Ongoing monitoring and maintenance will be crucial to uphold platform performance and reliability as the user base and project activity continue to grow. Overall, the developed decentralized crowdfunding platform represents a promising solution in the decentralized finance landscape, providing users with a reliable and transparent platform for crowdfunding their projects.