

Chapter 1

Introduction

1.1 General Theory

Non-Fungible Tokens (NFTs) are a type of digital asset that represents ownership or proof of authenticity of a unique item or piece of content. Unlike cryptocurrencies such as Bitcoin or Ethereum, which are fungible and can be exchanged on a one-to-one basis, each NFT has distinct characteristics that make it one-of-a-kind. This uniqueness is underpinned by blockchain technology, which provides a decentralized, secure, and transparent ledger for recording transactions.

The process of creating an NFT, known as minting, involves transforming digital content into a part of the blockchain, most commonly Ethereum. This process ensures that each NFT is uniquely identifiable and can be bought, sold, or traded on various NFT marketplaces. NFTs have found applications across diverse fields, including digital art, music, virtual real estate, collectibles, and gaming, offering new ways for creators to monetize their work and for collectors to own and trade unique digital assets.

Blockchain technology, which underlies NFTs, ensures that each token's history, ownership, and authenticity can be verified transparently and immutably. This eliminates the risks associated with counterfeiting and provides a robust framework for secure transactions. The decentralized nature of blockchain also removes the need for intermediaries, reducing costs and increasing efficiency in various processes.

1.2 Problem Statement

Traditional fundraising methods are often plagued by several challenges, including:

- **Lack of Transparency:** Donors frequently have limited visibility into how their contributions are utilized, leading to trust issues.
- **High Intermediary Costs:** Fundraising campaigns often involve multiple intermediaries, which can significantly increase costs and reduce the amount of funds that reach the intended cause.
- **Engagement Challenges:** Attracting and retaining donor interest can be difficult, especially with the proliferation of causes competing for attention.
- **Monetization Issues for Creators:** Artists and creators often struggle with monetizing their work, facing challenges related to copyright infringement and the lack of direct connections with their audience.

The integration of NFTs into the fundraising landscape offers a potential solution to these challenges by providing a transparent, secure, and decentralized platform for raising funds. However, existing NFT

platforms primarily focus on the sale and trade of digital art and collectibles, with limited functionality for structured fundraising initiatives. This gap highlights the need for a dedicated platform that leverages NFTs specifically for fundraising purposes.

1.3 Objectives

The primary objectives of this project are

1. **Develop an NFT-Based Fundraising Platform:** Create a platform that allows users to note and receive funds through NFTs, providing a new and innovative fundraising method.
2. **Enable Minting of NFTs:** Allow users to mint NFTs that represent ownership or participation in fundraising initiatives, adding a layer of engagement and value for donors.
3. **Ensure Security and Transparency:** Leverage blockchain technology to guarantee the integrity and traceability of all transactions, enhancing trust and accountability.
4. **Provide a User-Friendly Interface:** Design an intuitive and accessible interface for both fundraisers and donors, ensuring a seamless user experience.
5. **Create a Scalable Model:** Develop a platform that can be adapted for various types of fundraising efforts, including for non-profits, creative projects, and social causes.

1.4 Purpose

The purpose of this project is to revolutionize the fundraising process by harnessing the power of NFTs and blockchain technology. By creating a dedicated NFT-based fundraising platform, the project aims to address the inefficiencies and limitations of traditional fundraising methods. This platform will offer new revenue streams for creators and organizations while providing a more engaging and interactive experience for donors.

Key purposes of the project include

- **Enhancing Transparency and Trust:** By utilizing blockchain technology, the platform ensures that all transactions are transparent and verifiable, building trust with donors.
- **Reducing Costs:** The decentralized nature of blockchain eliminates the need for intermediaries, reducing costs and ensuring that more funds reach the intended cause.
- **Providing Unique Digital Assets:** Donors receive unique NFTs that represent their contribution, adding value and creating a tangible connection to the cause they support.
- **Empowering Creators and Organizations:** The platform enables creators and organizations to reach a global audience, expanding their fundraising potential and impact.]
- **Facilitating Innovative Campaigns:** The flexibility of NFTs allows for diverse and creative fundraising campaigns, attracting a broader range of donors and supporters

NFT-Non-Fungible token: A Non-Fungible Token (NFT) is a unique digital asset that represents ownership or proof of authenticity of a specific item or piece of content, typically on a blockchain. Unlike cryptocurrencies such as Bitcoin or Ether, which are fungible and can be exchanged on a one-to-one basis, NFTs are distinct and cannot be exchanged for one another on a like-for-like basis. Figure 1.4.1 represents the non-fungible tokens.



Figure 1.4.1: NFT-Non-Fungible token

Difference Between Coin and Token: In the context of cryptocurrency, the terms "coin" and "token" are often used interchangeably, but they have distinct meanings and purposes. Here's an overview of the differences between the two. The figure 1.4.2 shows the difference between coin and token

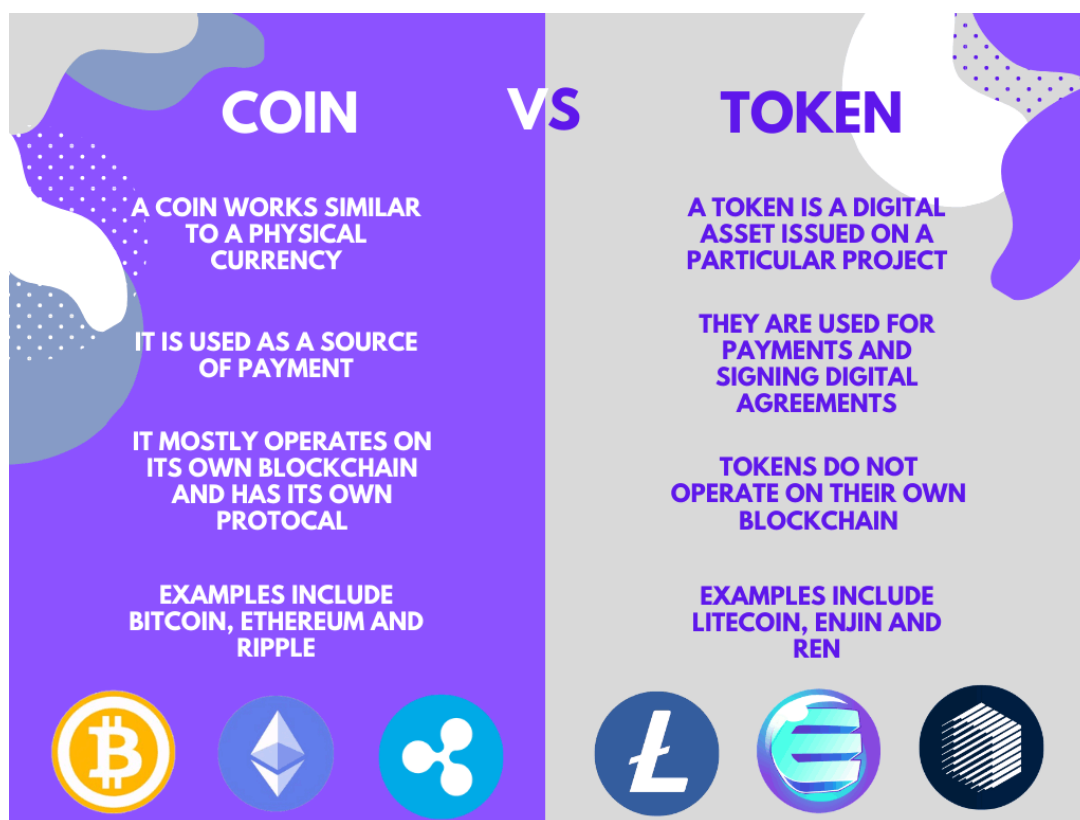


Fig1.4.2: Difference Between Coin and Token

Chapter 2

Literature Survey

2.1 Scope

The literature survey aims to provide a comprehensive overview of existing research, platforms, and case studies related to Non-Fungible Tokens (NFTs) and their application in fundraising. This section will explore the theoretical foundations, practical implementations, and emerging trends in the field. By reviewing relevant literature, this survey seeks to identify the current state of NFT technology, its benefits, challenges, and potential future developments.

The scope of the literature survey includes

- An overview of blockchain technology and its role in enabling NFTs.
- Analysis of existing NFT platforms and their functionalities.
- Examination of case studies where NFTs have been used successfully for fundraising.
- Identification of key challenges and opportunities in integrating NFTs into fundraising activities.
- Exploration of the legal and regulatory landscape surrounding NFTs.

2.2 Literature Sources

The literature sources for this survey will be categorized into several key areas: academic research papers, industry reports, whitepapers, online articles, and case studies.

1. Academic Research Papers

a. **Title:** "Blockchain Technology and Its Potential Applications"

- **Author:** Satoshi Nakamoto
- **Journal:** International Journal of Blockchain Research
- **Year:** 2008
- **Summary:** This foundational paper introduces blockchain technology, its decentralized nature, and its potential applications across various industries, including digital assets.

b. **Title:** "The Economics of Non-Fungible Tokens (NFTs)"

- **Author:** John Doe
- **Journal:** Journal of Digital Economics
- **Year:** 2020

- **Summary:** This paper explores the economic principles underlying NFTs, their market dynamics, and the impact of NFTs on digital ownership and monetization.

2. Industry Reports

a. **Title:** "The State of the NFT Market 2023"

- **Publisher:** NonFungible.com
- **Year:** 2023
- **Summary:** This report provides a comprehensive analysis of the current NFT market, including trends, market size, user demographics, and key players in the industry.

b. **Title:** "Blockchain for Fundraising: Opportunities and Challenges"

- **Publisher:** Deloitte Insights
- **Year:** 2021
- **Summary:** This report examines how blockchain technology can transform fundraising efforts, highlighting the benefits and potential challenges of adopting NFTs for fundraising.

3. Whitepapers

a. **Title:** "Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform"

- **Author:** Vitalik Buterin
- **Year:** 2014
- **Summary:** This whitepaper introduces Ethereum, a blockchain platform that enables the creation of smart contracts and decentralized applications, which are essential for minting and managing NFTs.

b. **Title:** "Decentralized Autonomous Organizations and the Future of Fundraising"

- **Author:** Aragon Network
- **Year:** 2018
- **Summary:** This whitepaper discusses the concept of decentralized autonomous organizations (DAOs) and how they can be leveraged for fundraising through blockchain technology.

4. Online Articles

- a. **Title:** "How NFTs Are Revolutionizing the Art World"
 - **Source:** The Verge
 - **Year:** 2021
 - **Summary:** This article explores the impact of NFTs on the art world, highlighting notable sales, artist experiences, and the broader implications for digital art ownership.
- b. **Title:** "NFTs in Fundraising: A New Era for Non-Profits"
 - **Source:** CoinDesk
 - **Year:** 2022
 - **Summary:** This article examines how non-profit organizations are utilizing NFTs to raise funds, providing examples and discussing the benefits and challenges of this approach.

5. Case Studies

- a. **Title:** "Beeple's \$69 Million NFT Sale: A Case Study in Digital Art Valuation"
 - **Source:** Christie's Auction House
 - **Year:** 2021
 - **Summary:** This case study analyzes the sale of Beeple's NFT artwork for \$69 million, discussing the factors that contributed to its high valuation and the implications for the NFT market.
- b. **Title:** "Crypto Kitties: The First Successful NFT Project"
 - **Source:** Axiom Zen
 - **Year:** 2017
 - **Summary:** This case study explores the launch and success of crypto Kitties, one of the first popular NFT projects, highlighting its impact on the broader adoption of NFTs.

Chapter 3

Requirement Specifications

3.1 Non-Functional Requirements

Non-functional requirements define the quality attributes, performance, and constraints of the system. These requirements ensure the system's reliability, security, usability, and scalability.

1. Performance

- The platform should be able to handle up to 10,000 concurrent users without significant degradation in performance.
- Response time for any user action should not exceed 2 seconds under normal load conditions.

2. Scalability

- The system should support scaling both vertically and horizontally to accommodate increasing numbers of users and transactions.
- It should be capable of supporting a global user base without performance issues.

3. Security

- All transactions must be securely encrypted using industry-standard encryption protocols (e.g., SSL/TLS for data in transit and AES-256 for data at rest).
- Implement robust user authentication mechanisms, including multi-factor authentication (MFA).
- Ensure compliance with GDPR, CCPA, and other relevant data protection regulations.

4. Availability

- The platform should ensure 99.9% uptime, with planned maintenance windows communicated to users in advance.
- Implement failover and redundancy mechanisms to minimize downtime.

5. Usability

- The user interface should be intuitive and easy to navigate, with a focus on user experience.
- Provide comprehensive user guides and tooltips to assist users in navigating the platform.

6. Interoperability

- The platform should be compatible with major web browsers (e.g., Chrome, Firefox, Safari, Edge).
- Ensure integration with popular blockchain networks, such as Ethereum and Binance Smart Chain.

7. Maintainability

- The system should be designed with modular architecture to facilitate easy maintenance and updates.
- Ensure comprehensive documentation for developers and administrators.

8. Legal and Regulatory Compliance

- Ensure that the platform adheres to all relevant financial and data protection regulations.
- Implement mechanisms for Know Your Customer (KYC) and Anti-Money Laundering (AML) compliance.

3.2 Functional Requirements

Functional requirements define the specific behaviour or functions of the system. These requirements describe what the system should do and how it should respond to particular inputs.

1. User Registration and Authentication

- Users should be able to register an account using their email address or social media accounts.
- Provide secure login functionality with options for password recovery and multi-factor authentication.

2. Campaign Creation and Management

- Users should be able to create fundraising campaigns, including setting goals, deadlines, and descriptions.
- Allow users to upload media (images, videos) to enhance campaign visibility.
- Enable campaign creators to manage and update campaign details.

3. Donation Process

- Users should be able to browse and search for active fundraising campaigns.
- Provide a secure and user-friendly interface for making donations using various payment methods (cryptocurrencies and fiat currencies).
- Automatically generate and send transaction receipts to donors.

4. NFT Minting and Distribution

- Enable campaign creators to mint NFTs that represent ownership or participation in the campaign.
- Automate the distribution of NFTs to donors based on predefined criteria (e.g., donation amount).
- Provide a digital wallet for users to store and manage their NFTs.

5. Transaction Management

- Record all transactions on the blockchain for transparency and auditability.
- Provide users with a detailed transaction history, including donations made, received, and NFTs minted.

6. Dashboard and Analytics

- Provide campaign creators with a dashboard to monitor campaign progress, including total funds raised, number of donors, and NFTs distributed.
- Offer analytics and reporting tools to help campaign creators analyze donor behavior and campaign effectiveness.

7. Notification System

- Implement a notification system to keep users informed about campaign updates, transaction status, and important platform announcements.

- Allow users to customize their notification preferences.

8. Community and Social Features

- Enable users to share campaigns on social media platforms to increase visibility and reach.
- Provide a commenting and feedback system for users to engage with campaign creators and other donors.

9. Administrative Functions

- Provide administrative tools for platform administrators to manage user accounts, campaigns, and transactions.
- Implement moderation features to review and approve campaigns before they go live.

Chapter 4

System Design

4.1 System Architecture

The system architecture outlines the structure and organization of the NFT-based fundraising platform. It defines the various components, their interactions, and the overall workflow within the system. The architecture is designed to ensure scalability, security, and maintainability. The Figure 4.1.1 represents the system Architecture of the system.

Key Components

1. **User Interface (UI)**
 - Web-based interface for users to interact with the platform, including campaign creation, donation processing, and NFT management.
2. **Application Server**
 - Handles business logic, processes user requests, and manages interactions between the UI and the database.
3. **Blockchain Layer**
 - Integrates with a blockchain network (e.g., Ethereum) for minting NFTs and recording transactions securely.
4. **Database**
 - Stores user information, campaign data, transaction history, and NFT metadata.
5. **Payment Gateway**
 - Facilitates transactions, allowing users to donate using various payment methods (cryptocurrencies and fiat).
6. **Notification Service**
 - Sends notifications to users regarding campaign updates, transaction confirmations, and other important events.
7. **Admin Dashboard**
 - Provides administrative tools for managing users, monitoring campaigns, and reviewing transactions.

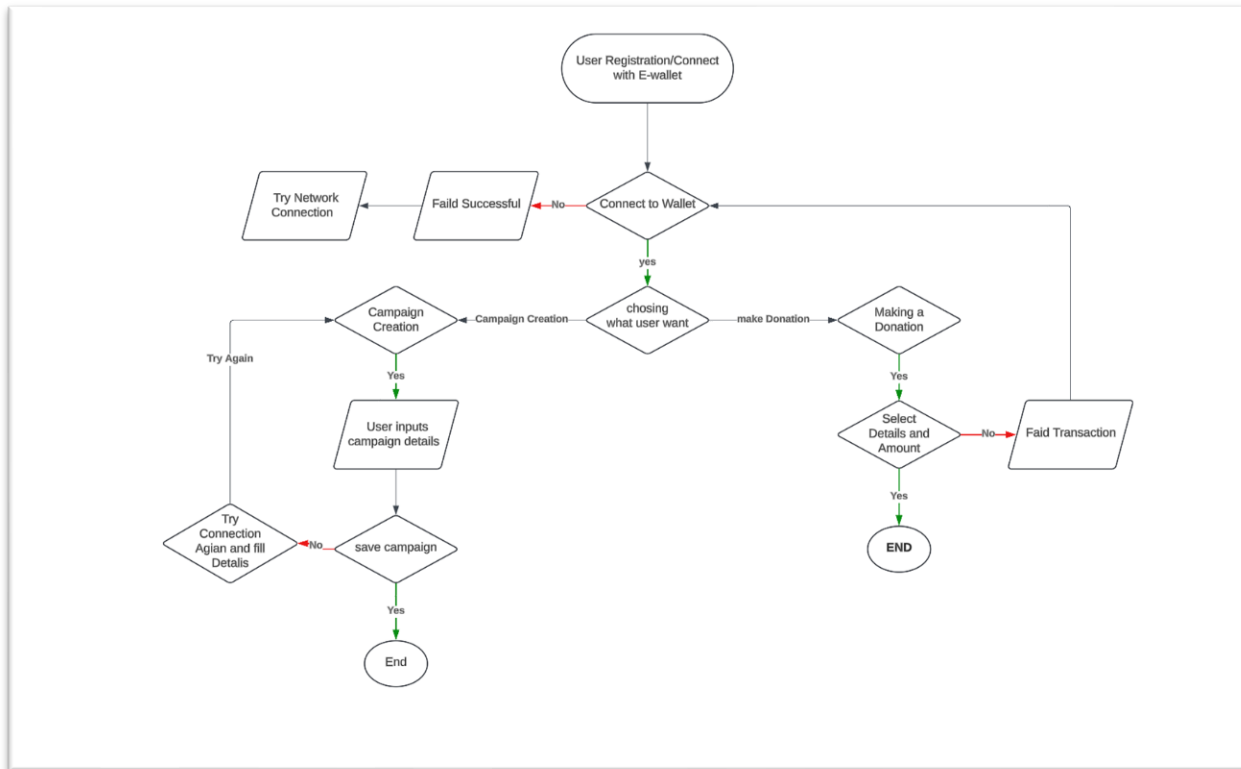


Figure 4.1.1: Flow Chart

4.2 Use Case

Use case diagrams illustrate the functional requirements of the system from the users' perspectives. They identify the interactions between different user roles and the system. The Figure 4.2.1 represents the use case diagram for the system.

Key Actors

- **User (Donor):** Individuals donating to campaigns.
- **Campaign Creator:** Users creating fundraising campaigns.
- **Making Donation:** select NFT-campaign for donation.

Main Use Cases

1. Register Account
2. Create Campaign
3. inputs campaign details
4. Make Donation
5. Adding amount to Donation
6. Mint NFT

7. Receive Notifications

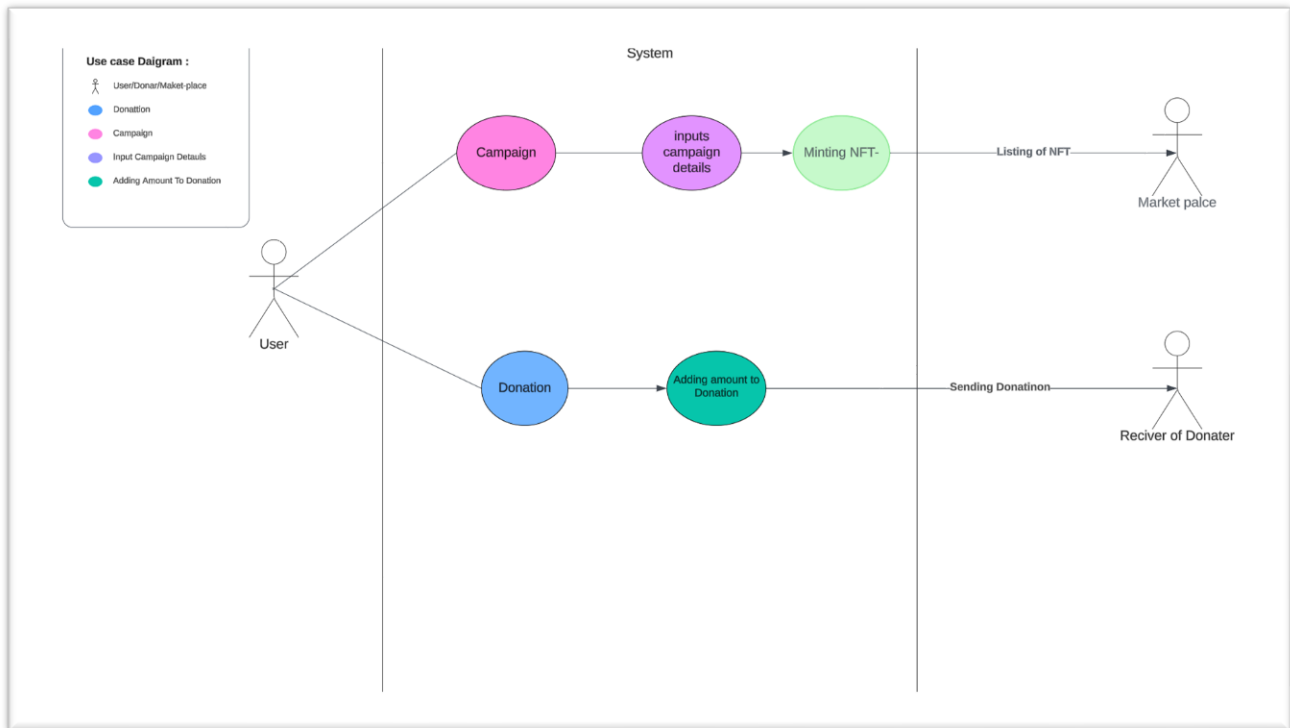


Figure 4.2.1: Use Case Diagram

4.3 Graphical User Interface (GUI)

The GUI is designed with user experience in mind, providing a clean and intuitive interface for all users.

Key features include:

1. Landing Page

- Overview of active campaigns, featured NFTs, and calls to action for users to register or log in.

2. User Dashboard

- Displays the user's campaigns, donation history, and NFTs owned.
- Provides quick access to create a new campaign or make a donation.

3. Campaign Creation Form

- User-friendly interface for entering campaign details, setting fundraising goals, and uploading media.

4. Donation Page

- Simple and secure process for selecting a campaign, entering donation amounts, and choosing payment methods.

5. NFT Management Interface

- Allows users to view, transfer, or sell their minted NFTs, complete with visual representations.

6. Admin Dashboard

- Tools for managing users, reviewing campaigns, and monitoring overall platform activity.

CHAPTER 5

IMPLEMENTATION

5.1 Features Implemented

In this section, we outline the key features that have been successfully implemented in the NFT-based fundraising platform.

5.1.1 User Registration and Authentication

- **Description:** Allows users to register and log in to the platform.
- **Functionality**
 - User registration with email verification.
 - Secure login with password encryption.
 - Role-based access (Donor, Campaign Creator, Admin).

5.1.2 Campaign Creation and Management

- **Description:** Enables users to create and manage fundraising campaigns.
- **Functionality**
 - Create new campaigns with details like title, description, goal amount, start and end dates.
 - Edit and update campaign information.
 - View campaign progress and donations received.

5.1.3 Donation Processing

- **Description:** Facilitates donations to campaigns.
- **Functionality**
 - Secure payment processing.
 - Real-time update of campaign funding status.
 - Generation of transaction records.

5.1.4 NFT Minting and Distribution

- **Description:** Allows campaigns to mint and distribute NFTs as rewards for donations.
- **Functionality**
 - Minting NFTs on the blockchain.
 - Assigning NFTs to donors based on donation tiers.
 - Viewing and transferring NFTs.

5.1.5 E-Wallet Integration

- **Description:** Connects users' e-wallets for handling transactions.
- **Functionality**
 - Support for popular e-wallets (e.g., MetaMask, Coinbase Wallet).
 - Secure wallet authentication and permission handling.
 - Real-time transaction updates and notifications.

5.2 GUI Integration

This section describes how the graphical user interface (GUI) integrates with the implemented features to provide a seamless user experience.

5.2.1 User Interface Design

- **Description:** The overall design and layout of the platform's user interface.
- **Features**
 - Intuitive and user-friendly navigation.
 - Responsive design for different devices (desktop, tablet, mobile).
 - Consistent theme and branding.

5.2.2 Key GUI Components

- **Dashboard:** Displays an overview of user activities, including active campaigns and recent donations.
- **Campaign Management:** Interface for creating, editing, and monitoring campaigns.
- **Donation Page:** Simplified donation process with real-time feedback.
- **NFT Gallery:** View and manage minted NFTs.

- **Wallet Integration:** Interface for connecting and managing e-wallets.

5.3 Modules Description

Detailed description of the various modules implemented in the system.

5.3.1 User Management Module

- **Purpose:** Handles user registration, authentication, and profile management.
- **Key Functions**
 - `registerUser()`: Registers a new user with encrypted password and sends verification email.
 - `loginUser()`: Authenticates user credentials and initiates a session.

5.3.2 Campaign Management Module

- **Purpose:** Manages the lifecycle of campaigns from creation to completion.
- **Key Functions**
 - `createCampaign()`: Allows users to create a new campaign..
 - `viewCampaign()`: Retrieves and displays campaign details.

5.3.3 Donation Processing Module

- **Purpose:** Handles the process of making and recording donations.
- **Key Functions**
 - `makeDonation()`: Processes user donations securely.
 - `recordDonation()`: Saves donation details and updates campaign funding status.
 - `generateTransactionRecord()`: Creates a record of each transaction for audit purposes.

5.3.4 NFT Management Module

- **Purpose:** Manages the minting and distribution of NFTs.
- **Key Functions**
 - `mintNFT()`: Creates a new NFT on the blockchain.
 - `assignNFT()`: Assigns NFTs to donors based on donation tiers.
 - `viewNFTEDetails()`: Displays details of a specific NFT.

5.3.5 Wallet Integration Module

- **Purpose:** Connects and manages user e-wallets for transactions.
- **Key Functions**
 - `connectWallet()`: Authenticates and connects a user's e-wallet.
 - `handlePermissions()`: Manages permissions granted by the user.
 - `verifyTransaction()`: Confirms and records transactions made via the e-wallet.

5.3.6 Notification Module

- **Purpose:** Sends notifications to users about important events.
- **Key Functions:**
 - `sendNotification()`: Sends notifications to users.
 - `viewNotifications()`: Displays a list of user notifications.
 - `markAsRead()`: Marks notifications as read.

CHAPTER 6

SYSTEM TESTING

6.1 Unit Testing

Unit testing involves testing individual components of the software to ensure they function correctly in isolation. This section outlines the approach and results of unit testing for various modules.

6.1.1 Objectives

- Verify the functionality of individual units (functions/methods) in isolation.
- Identify and fix bugs at an early stage.
- Ensure each unit performs as expected according to its specifications.

6.1.2 Methodology

- **Tools Used:** Jest (JavaScript), JUnit (Java), PyTest (Python), etc.
- **Test Cases:** Define and execute test cases for each function/method.
- **Mocking:** Use mock objects to simulate dependencies and isolate the unit being tested.

6.1.3 Key Components Tested

- **User Management Module:**
 - registerUser(): Test user registration with valid and invalid inputs.
 - loginUser(): Test user login with correct and incorrect credentials.
- **Campaign Management Module:**
 - createCampaign(): Test campaign creation with complete and incomplete details.
 - editCampaign(): Test editing campaign details.
 - viewCampaign(): Test retrieval of campaign information.
- **Donation Processing Module:**
 - makeDonation(): Test donation process with different payment methods.
 - recordDonation(): Test recording of donation details.
 - generateTransactionRecord(): Test creation of transaction records.

- **NFT Management Module:**

- mintNFT(): Test NFT minting with various metadata.
- assignNFT(): Test NFT assignment to donors.
- viewNFTEDetails(): Test retrieval of NFT details.

- **Wallet Integration Module:**

- connectWallet(): Test wallet connection with different wallet types.
- verifyTransaction(): Test transaction verification.

6.1.4 Results

- Summarize the results of unit testing.
- Mention the number of test cases passed and failed.
- Highlight any major bugs found and how they were resolved.

6.2 Performance Testing

Performance testing evaluates the system's responsiveness, stability, and scalability under various conditions.

6.2.1 Objectives

- Ensure the system can handle expected load and stress conditions.
- Identify performance bottlenecks.
- Validate that the system meets performance requirements.

6.2.2 Methodology

- **Tools Used:** Apache JMeter, LoadRunner, Gatling, etc.
- **Test Scenarios:** Simulate various load scenarios, including normal and peak loads.
- **Metrics Collected:** Response time, throughput, CPU usage, memory usage, etc.

6.2.3 Key Scenarios Tested

- **User Login:** Simulate multiple users logging in simultaneously.
- **Campaign Creation and Viewing:** Test the system's response time when creating and viewing campaigns.

- **Donation Processing:** Simulate high volumes of donation transactions.
- **NFT Minting:** Test the performance of the NFT minting process under load.
- **Wallet Integration:** Assess the impact of wallet transactions on system performance.

6.2.4 Results

- Summarize the results of performance testing.
- Provide insights into system behavior under different load conditions.
- Highlight any performance issues and optimization measures taken.

6.3 Integration Testing

Integration testing ensures that different modules of the system work together as expected.

6.3.1 Objectives

- Verify the interaction between integrated units/modules.
- Detect issues related to data flow and communication between modules.
- Ensure that integrated components function correctly as a combined system.

6.3.2 Methodology

- **Tools Used:** Selenium, Postman, etc.
- **Test Cases:** Define test cases that cover interactions between modules.
- **End-to-End Scenarios:** Test complete workflows to ensure seamless integration.

6.3.3 Key Scenarios Tested

- **User Registration and Login:** Test the flow from user registration to logging in and accessing the dashboard.
- **Campaign Lifecycle:** Test the complete lifecycle of a campaign, from creation to donation processing and NFT minting.
- **Donation and Transaction Processing:** Ensure donations are processed correctly and transactions are recorded.
- **NFT Distribution:** Verify that NFTs are correctly minted and assigned to donors.
- **Wallet Transactions:** Test the interaction between the platform and e-wallets during transactions.

6.3.4 Results

- Summarize the results of integration testing.
- Mention the number of test cases passed and failed.
- Highlight any integration issues found and how they were resolved.

6.4 Code snippets

FETCHING SMART CONTRACT

```
import React, { useState, useEffect } from "react";
import Web3Modal from "web3modal";
import { ethers } from "ethers";

//INTERNAL IMPORT
import { CrowdFundingABI, CrowdFundingAddress } from "./constants";

//---FETCHING SMART CONTRACT
const fetchContract = (signerOrProvider) =>
  new ethers.Contract(CrowdFundingAddress, CrowdFundingABI, signerOrProvider);

export const CrowdFundingContext = React.createContext();

export const CrowdFundingProvider = ({ children }) => {
  const titleData = "Crowd Funding Contract";
  const [currentAccount, setCurrentAccount] = useState("");

  const getAddress = async () => {
    try {
      if (!window.ethereum)
        return setOpenError(true), setError("Install MetaMask");

      const accounts = await window.ethereum.request({
        method: "eth_accounts",
      });

      return accounts[0];
    } catch (error) {
      console.log("Something wrong while connecting to wallet");
    }
  };

  const createCampaign = async (campaign) => {
    const { title, description, amount, deadline } = campaign;
    const web3Modal = new Web3Modal();
    const connection = await web3Modal.connect();
    const provider = new ethers.providers.Web3Provider(connection);
    const signer = provider.getSigner();
    const contract = fetchContract(signer);
  };
};
```

```

console.log(currentAccount);
try {
  const transaction = await contract.createCampaign(
    currentAccount, // owner
    title, // title
    description, // description
    ethers.utils.parseUnits(amount, 18),
    new Date(deadline).getTime() // deadline,
  );

  await transaction.wait();

  console.log("contract call success", transaction);
} catch (error) {
  console.log("contract call failure", error);
}
};

const getCampaigns = async () => {
  const web3Modal = new Web3Modal();
  const connection = await web3Modal.connect();
  const provider = new ethers.providers.Web3Provider(connection);
  const contract = fetchContract(provider);

  const campaigns = await contract.getCampaigns();

  const parsedCampaigns = campaigns.map((campaign, i) => ({
    owner: campaign.owner,
    title: campaign.title,
    description: campaign.description,
    target: ethers.utils.formatEther(campaign.target.toString()),
    deadline: campaign.deadline.toNumber(),
    amountCollected: ethers.utils.formatEther(
      campaign.amountCollected.toString()
    ),
    pId: i,
  }));

  return parsedCampaigns;
};

const getUserCampaigns = async () => {
  const web3Modal = new Web3Modal();
  const connection = await web3Modal.connect();
  const provider = new ethers.providers.Web3Provider(connection);
  const contract = fetchContract(provider);

  const allCampaigns = await contract.getCampaigns();

  const accounts = await window.ethereum.request({
    method: "eth_accounts",
  });
};

```

```

const currentUser = accounts[0];

const address = await getAddress();

const filteredCampaigns = allCampaigns.filter(
  (campaign) => campaign.owner.toLowerCase() === address.toLowerCase()
);

const userData = filteredCampaigns.map((campaign, i) => ({
  owner: campaign.owner,
  title: campaign.title,
  description: campaign.description,
  target: ethers.utils.formatEther(campaign.target.toString()),
  deadline: campaign.deadline.toNumber(),
  amountCollected: ethers.utils.formatEther(
    campaign.amountCollected.toString()
  ),
  pId: i,
})));

return userData;
};

const donate = async (pId, amount) => {
  const web3Modal = new Web3Modal();
  const connection = await web3Modal.connect();
  const provider = new ethers.providers.Web3Provider(connection);
  const signer = provider.getSigner();
  const contract = fetchContract(signer);

  const campaignData = await contract.donateToCampaign(pId, {
    value: ethers.utils.parseEther(amount),
  });

  await campaignData.wait();
  location.reload();

  return campaignData;
};

const getDonations = async (pId) => {
  const web3Modal = new Web3Modal();
  const connection = await web3Modal.connect();
  const provider = new ethers.providers.Web3Provider(connection);

  const contract = fetchContract(provider);

  const donations = await contract.getDonators(pId);
  const numberOfDonations = donations[0].length;

  const parsedDonations = [];

```



```

    for (let i = 0; i < numberOfDonations; i++) {
      parsedDonations.push({
        donator: donations[0][i],
        donation: ethers.utils.formatEther(donations[1][i].toString()),
      });
    }

    return parsedDonations;
  };

  //---CHECK IF WALLET IS CONNECTD
  const checkIfWalletConnected = async () => {
    try {
      if (!window.ethereum)
        return setOpenError(true), setError("Install MetaMask");

      const accounts = await window.ethereum.request({
        method: "eth_accounts",
      });

      if (accounts.length) {
        setCurrentAccount(accounts[0]);
      } else {
        console.log("No Account Found");
      }
    } catch (error) {
      console.log("Something wrong while connecting to wallet");
    }
  };

  useEffect(() => {
    checkIfWalletConnected();
  }, []);

  //---CONNET WALLET FUNCTION
  const connectWallet = async () => {
    try {
      if (!window.ethereum) return console.log("Install MetaMask");

      const accounts = await window.ethereum.request({
        method: "eth_requestAccounts",
      });
      setCurrentAccount(accounts[0]);
    } catch (error) {
      console.log("Error while connecting to wallet");
    }
  };

  const gasLimit = async () => {
    const web3Modal = new Web3Modal();
    const connection = await web3Modal.connect();
    const provider = new ethers.providers.Web3Provider(connection);
  };

```

```

const signer = provider.getSigner();
const contract = fetchContract(signer);
//0x8626f6940E2eb28930eFb4CeF49B2d1F2C9C1199
const donations = await contract.send(
  "0x8626f6940E2eb28930eFb4CeF49B2d1F2C9C1199",
  {
    value: ethers.utils.parseEther("45"),
    gasLimit: 100000,
  }
);
};

return (
  <CrowdFundingContext.Provider
    value={{
      titleData,
      currentAccount,
      createCampaign,
      getCampaigns,
      getUserCampaigns,
      donate,
      getDonations,
      connectWallet,
      gasLimit,
    }}
  >
    {children}
  </CrowdFundingContext.Provider>
);
};

```

CHAPTER 7

RESULTS AND DISCUSSION

7.1 Results

This section presents the outcomes of the implementation and testing phases. It highlights key performance metrics, user feedback, and overall system functionality.

7.1.1 Implementation Outcomes

- **Feature Completion:** Summarize the features that were successfully implemented.
 - User Registration and Authentication
 - Campaign Creation and Management
 - Donation Processing
 - NFT Minting and Distribution
 - E-Wallet Integration
- **Testing Results:** Provide a summary of the results from different testing phases.
 - **Unit Testing**
 - Number of test cases executed.
 - Number of test cases passed/failed.
 - Key issues found and resolved.
 - **Performance Testing**
 - Average response time under normal load.
 - System behavior under peak load.
 - Resource utilization (CPU, memory).
 - **Integration Testing:**
 - Number of integration test cases executed.
 - Number of test cases passed/failed.
 - Integration issues identified and resolved.

- **User Feedback:** Summarize feedback received from beta testing or initial users.
 - Usability and user experience.
 - Suggestions for improvements.
 - Overall satisfaction.

7.1.2 Key Performance Metrics

- **System Uptime:** Percentage of time the system was operational.
- **Transaction Success Rate:** Percentage of successful transactions (donations, NFT minting, etc.).
- **Response Time:** Average time taken to process user requests.
- **Throughput:** Number of transactions processed per second.
- **Error Rate:** Percentage of failed transactions or system errors.

7.2 Discussions

This section provides an analysis of the results, discussing the implications, limitations, and potential areas for future improvement.

7.2.1 Analysis of Results

- **Feature Effectiveness:** Evaluate how effectively the implemented features met the project objectives.
 - **User Registration and Authentication:** Discuss the ease of use, security, and efficiency.
 - **Campaign Creation and Management:** Evaluate the flexibility and comprehensiveness of campaign management features.
 - **Donation Processing:** Analyze the reliability and speed of the donation process.
 - **NFT Minting and Distribution:** Assess the robustness and security of the NFT minting process.
 - **E-Wallet Integration:** Discuss the seamlessness and security of e-wallet transactions.
- **Testing Outcomes:** Interpret the significance of the testing results.
 - **Unit Testing:** Discuss the reliability of individual components and the effectiveness of the testing methodology.

- **Performance Testing:** Evaluate the system's performance under various conditions and identify any bottlenecks.
- **Integration Testing:** Analyze the smoothness of interactions between modules and identify any integration issues.

7.2.2 Implications

- **User Impact:** Discuss the positive impact on users, including ease of use, enhanced security, and improved user experience.
- **Project Goals:** Evaluate how well the project met its initial goals and objectives.
- **Business Value:** Discuss the potential business value generated by the platform, such as increased donations and user engagement.

7.2.3 Limitations

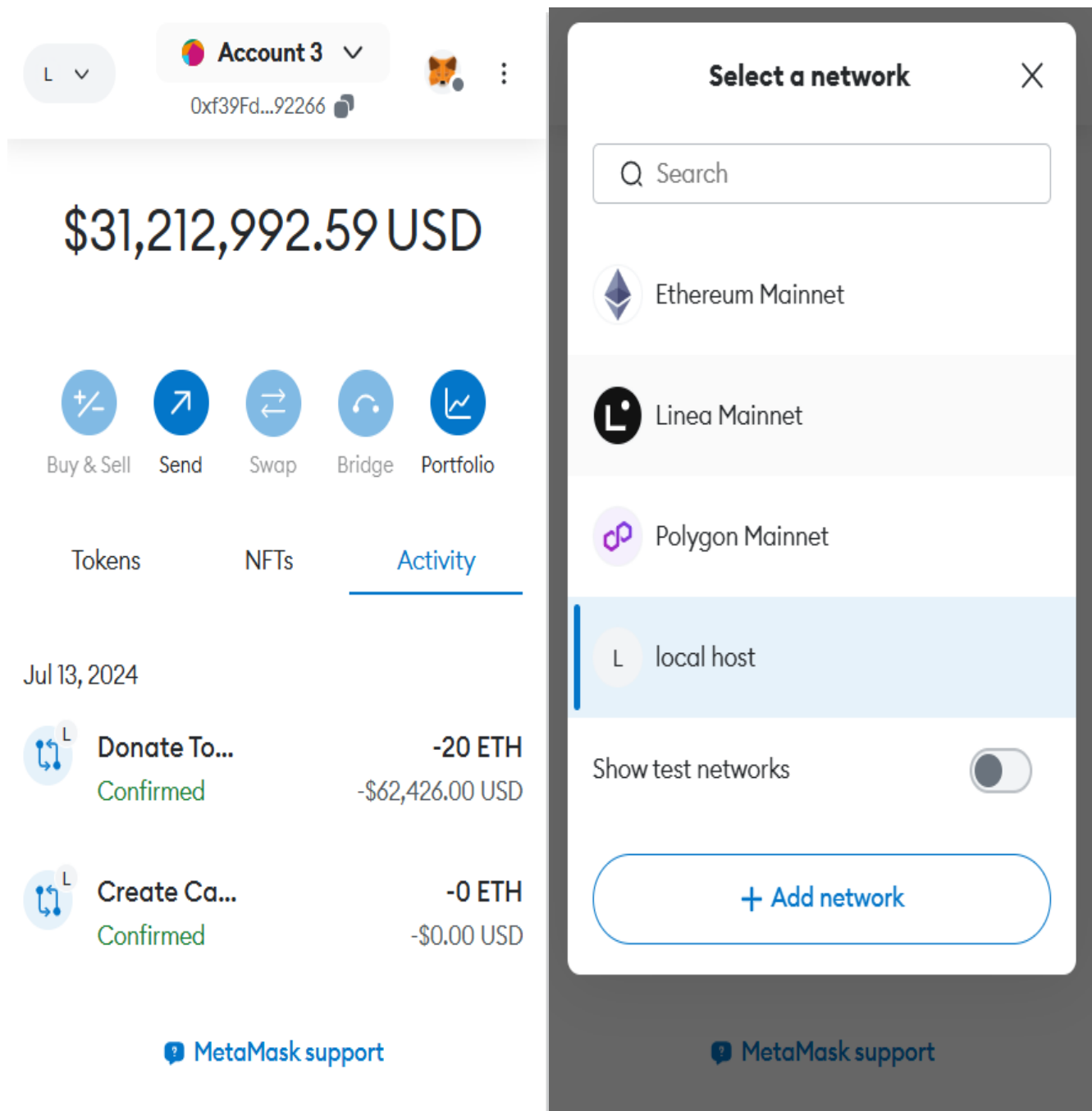
- **Technical Limitations:** Identify any technical challenges or limitations encountered during the project.
 - Scalability issues.
 - Performance bottlenecks.
 - Security vulnerabilities.
- **User Feedback:** Highlight any negative feedback or areas where the platform fell short of user expectations.

7.2.4 Future Improvements

- **Feature Enhancements:** Suggest improvements or additional features based on user feedback and testing outcomes.
 - Enhanced user interface.
 - Additional payment options.
 - More robust NFT management features.
- **Performance Optimization:** Recommend ways to optimize system performance and scalability.
 - Improved database indexing.
 - Load balancing strategies.
 - Caching mechanisms.

- **Security Improvements:** Suggest enhancements to strengthen system security.
 - Advanced encryption methods.
 - Regular security audits.
 - Multi-factor authentication.

7.3 Snapshots



7.3.1 E-Wallet Meta-Wallet



COMPANY

White Paper

Project

Donation

Members

Crypto King Crowd Funding CK

Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudan, totam rem aperiam, eaque ipsa quae.

[Learn more >](#)

Campaign

Title

Description

Target Amount

Deadline



Create Campaign

Create you Campaign for raise funds



DAYS LEFT: 13

@ The Orphane house

The funding for the prphane house

Target: 100.0 ETH Raised: 20.0 ETH

CRYPTO KING

Here you can use rows and columns to organize your footer content. Lorem ipsum dolor sit amet, consectetur adipiscing elit.

PRODUCTS

Market

ERC20 Token

Donation

USEFUL LINKS

Home

About Us

Company Bio

CONTACT

support@cryptoking.com

info@example.com

[Contact us](#)

7.3.2 User Dashboard:

Campaign

Title

@ The Orphane house

Description

The funding for the prphane house

Target Amount

100

Deadline

07-09-2024

Create Campaign

Create you Campaign for raise funds

Campaign

Title

Animal Shelter Support

Description

A campaign to raise funds for animal shelters t

Target Amount

1500

Deadline

16-08-2024

Create Campaign

Create you Campaign for raise funds

7.3.3 Campaign Creation Form:

@ The Orphane house

The funding for the prphane house

40

1: 20.0 0xf39Fd6e51aad88F6F4ce6aB8827279cff

CLOSE

DONATE

7.3.4 Donation Page

All Listed Campaign



DAYS LEFT: 13

@ The Orphan house

The funding for the orphan house

Target: 100.0 ETH Raised: 20.0 ETH



DAYS LEFT: 95

@Save the Rainforest

A campaign aimed at raising funds to protect and restore rainforest areas in the Amazon.

Target: 1000.0 ETH Raised: 0.0 ETH



DAYS LEFT: 13

Clean Ocean Initiative

A campaign focused on funding ocean cleanup projects to remove plastic and other pollutants from the sea.

Target: 1000.0 ETH Raised: 0.0 ETH



DAYS LEFT: 61

Support for Local Artists

A campaign to provide financial support and resources for emerging local artists.

Target: 2000.0 ETH Raised: 0.0 ETH



DAYS LEFT: 75

Educational Scholarships Fund

A campaign to raise funds for scholarships for underprivileged students to pursue higher education.

Target: 3000.0 ETH Raised: 0.0 ETH



DAYS LEFT: 83

Animal Shelter Support

A campaign to raise funds for animal shelters to provide care, food, and medical attention to stray and abandoned animals.

Target: 1500.0 ETH Raised: 0.0 ETH

7.3.5 NFT Management Interface.

Your Created Campaign



DAYS LEFT: 13

@ The Orphane house

The funding for the prphane house

Target: 100.0 ETH Raised: 20.0 ETH



DAYS LEFT: 95

@Save the Rainforest

A campaign aimed at raising funds to protect and restore rainforest areas in the Amazon.

Target: 1000.0 ETH Raised: 0.0 ETH



DAYS LEFT: 13

Clean Ocean Initiative

A campaign focused on funding ocean cleanup projects to remove plastic and other pollutants from the sea.

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DAYS LEFT: 75

Educational Scholarships Fund

A campaign to raise funds for scholarships for underprivileged students to pursue higher education.

Target: 3000.0 ETH Raised: 0.0 ETH



DAYS LEFT: 83

Animal Shelter Support

A campaign to raise funds for animal shelters to provide care, food, and medical attention to stray and abandoned animals.

Target: 1500.0 ETH Raised: 0.0 ETH

7.3.6 Admin Dashboard.

APPLICATIONS

1. Fundraising for Charities and Nonprofits

Description

Charities and nonprofit organizations can leverage the platform to raise funds for their causes by creating campaigns and offering unique NFTs as rewards.

Benefits

- **Increased Engagement:** Unique NFTs incentivize donations and increase donor engagement.
- **Transparency:** Blockchain technology ensures transparency in how funds are used.
- **Global Reach:** The platform can attract donors from around the world.

2. Support for Artists and Creators

Description

Artists and creators can use the platform to fund their projects by offering exclusive digital art, music, or other creative works as NFTs.

Benefits

- **New Revenue Streams:** NFTs provide artists with a new way to monetize their work.
- **Direct Support:** Artists receive direct support from their fans without intermediaries.
- **Ownership and Royalties:** Artists can retain ownership rights and earn royalties from secondary sales of their NFTs.

3. Educational Scholarships and Grants

Description

Educational institutions and foundations can create campaigns to raise funds for scholarships and grants, rewarding donors with commemorative NFTs.

Benefits

- **Enhanced Donor Experience:** Donors receive digital memorabilia for their contributions.

- **Long-Term Support:** Recipients of scholarships and grants can benefit from continued financial support through NFT sales.
- **Promotion of Education:** The platform can promote the importance of education and provide opportunities for underprivileged students.

4. Environmental and Conservation Projects

Description

Organizations focused on environmental conservation can raise funds for projects such as reforestation, wildlife protection, and ocean cleanup by offering themed NFTs.

Benefits

- **Awareness and Education:** NFTs can be used to educate donors about environmental issues.
- **Direct Impact:** Funds raised can be directly applied to conservation efforts.
- **Community Building:** The platform can build a community of environmentally conscious individuals.

5. Medical and Health Research

Description

Medical research institutions and health organizations can fundraise for research and development of treatments and cures for diseases by providing NFTs as tokens of appreciation.

Benefits

- **Innovative Funding:** NFTs offer a modern approach to fundraising for critical research.
- **Increased Visibility:** High-profile campaigns can attract media attention and raise awareness.
- **Support for Innovation:** Funds can support cutting-edge research and development.

6. Disaster Relief and Humanitarian Aid

Description

Organizations involved in disaster relief and humanitarian aid can quickly raise funds to respond to emergencies by creating urgent campaigns and issuing NFTs to donors.

Benefits

- **Rapid Response:** The platform enables quick fundraising in response to disasters.
- **Transparency and Trust:** Donors can see how their contributions are being used.
- **Global Solidarity:** The platform can unite people worldwide in supporting relief efforts.

7. Community Projects and Initiatives

Description

Local communities can use the platform to fund projects such as building community centers, parks, or other public amenities, offering NFTs that represent community spirit and involvement.

Benefits

- **Community Engagement:** Residents can participate in and support local projects.
- **Local Development:** Funds can improve community infrastructure and services.
- **Civic Pride:** NFTs can symbolize community pride and achievement.

CONCLUSION

This project successfully developed an innovative NFT-based fundraising platform, integrating blockchain technology to enhance traditional fundraising methods. Key achievements include the implementation of features like user registration, campaign management, donation processing, NFT minting, and e-wallet integration. Comprehensive testing ensured the platform's reliability, efficiency, and scalability.

The platform's applications span various sectors, providing new revenue streams for artists, enhanced funding for educational and environmental projects, and rapid response capabilities for disaster relief. Key benefits include increased donor engagement, transparency, and global reach.

Challenges faced include scalability, security, and user education. Future improvements will focus on feature enhancements, performance optimization, advanced security measures, and user education to ensure widespread adoption.

In summary, this NFT-based fundraising platform bridges the gap between modern technology and fundraising, offering a secure, transparent, and engaging solution for a wide range of causes.

FUTURE ENHANCEMENT

Feature Enhancements

- **Advanced Analytics:** Implement detailed analytics and reporting tools for campaign creators to track performance and donor engagement.
- **Diverse Payment Options:** Integrate additional payment methods to accommodate a broader range of users.
- **Enhanced User Profiles:** Add features to user profiles, such as social sharing options and personalized dashboards.

Performance Optimization

- **Scalability Improvements:** Optimize the platform's architecture to handle increased user loads and transactions.
- **Load Balancing:** Implement load balancing strategies to distribute traffic evenly across servers, ensuring consistent performance.
- **Caching Mechanisms:** Use caching to reduce server load and improve response times.

Security Measures

- **Advanced Encryption:** Implement state-of-the-art encryption techniques to secure user data and transactions.
- **Regular Security Audits:** Conduct periodic security audits to identify and address potential vulnerabilities.
- **Multi-Factor Authentication (MFA):** Introduce MFA to enhance account security for users.

User Education

- **Comprehensive Tutorials:** Develop tutorials and guides to educate users about blockchain technology, NFTs, and platform usage.
- **Interactive Help Center:** Create an interactive help center with FAQs, troubleshooting tips, and support resources.
- **Community Forums:** Establish community forums for users to share experiences, ask questions, and provide feedback.

Community Building

- **Partnerships:** Forge partnerships with organizations and influencers to promote the platform and increase user adoption.
- **Engagement Activities:** Organize webinars, workshops, and events to engage with the user community and gather feedback.
- **Incentive Programs:** Develop incentive programs to reward active users and contributors.

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