**CHAPTER 4: RESULTS AND DISCUSSION**

This chapter discusses the results and technical implementation of the Decentralized Investment Campaign Platform. The platform enables investors to participate in campaigns using fiat (EcoCash/Paynow) and automatically receive ERC-721 NFTs as investment certificates. Additionally, it provides campaign creators tools to manage tokens and track funding progress transparently.

**4.1 Hardware Specification**

**Table 4.1 Computer Specifications**

| **Hardware** | **Technical Specification** | **Purpose** |
| --- | --- | --- |
| Processor | Intel Core i3 and above | Application development and server hosting |
| RAM | 8GB and above | Smooth running of MongoDB and local testing environments |
| Storage | 128GB SSD or higher | Project files, logs, local DB dumps |

**Table 4.2 Mobile App Hardware Requirements**

| **Hardware** | **Technical Specification** | **Purpose** |
| --- | --- | --- |
| OS | Android 7.0+ | Wallet integration (MetaMask) & testing |
| RAM | 2GB and above | Application usability on low-end phones |
| Storage | 16GB | To store MetaMask and browser cache |

**4.2 Software Requirements**

**Table 4.3 Mobile Phone Web Browsers**

| **Browser** | **Technical Requirement** |
| --- | --- |
| iOS | iOS 12.1+ with Safari 12+ or Chrome 89+ |
| Android | Android 7+ with Chrome 89+ |

**Table 4.4 Computer Web Browsers**

| **Browser** | **Requirement** |
| --- | --- |
| Chrome | Version 89+ |
| Firefox | Version 78+ |
| Safari | Version 12+ |
| Edge | Version 44+ |

**4.3 System Overview**

The system consists of:

* **Admin Panel:** Manages campaigns, users, KYC, approvals, and flags suspicious activity.
* **Investor Panel:** Enables fiat payments and investment in active campaigns.
* **Campaign Creator Dashboard:** Tracks funds raised, edits campaign info, uploads documents.
* **NFT Minting Engine:** Mints ERC-721 tokens upon successful payment confirmation.
* **Paynow Integration:** Handles real-world payments using EcoCash in test and live modes.

**[Insert Screenshot: Home Page of the DApp]**

**4.4 Test Plan**

**Test Strategy**

The application was tested using a layered testing approach including:

* Unit Testing (e.g., /campaigns/invest)
* Integration Testing (Wallet ↔ Paynow ↔ Blockchain ↔ MongoDB)
* System Testing (All modules)
* Manual UI Testing (Modals, validation errors, flows)

**4.5 Module Testing Results**

**Table 4.5 Login Module**

| **Test Case ID** | **Description** | **Data** | **Expected Result** | **Result** |
| --- | --- | --- | --- | --- |
| Login01 | Valid login | Valid email & password | Redirect to dashboard | Pass |

**[Insert Screenshot: Login with verified user]**

**Table 4.6 Signup Module**

| **Test Case ID** | **Description** | **Data** | **Expected Result** | **Result** |
| --- | --- | --- | --- | --- |
| Signup01 | Signup with all required fields | Valid info | Redirect + verification email | Pass |

**[Insert Screenshot: Signup Modal Form]**

**Table 4.7 KYC Upload Module**

| **Test Case ID** | **Description** | **Data** | **Expected Result** | **Result** |
| --- | --- | --- | --- | --- |
| KYC01 | Upload PDF/PNG | Valid files | Shows "Pending Approval" | Pass |

**[Insert Screenshot: Upload KYC form in Profile page]**

**Table 4.8 Launch Campaign Module**

| **Test Case ID** | **Description** | **Data** | **Expected Result** | **Result** |
| --- | --- | --- | --- | --- |
| LC01 | Submit modal form | Complete fields | Campaign created and awaits approval | Pass |

**[Insert Screenshot: Launch Campaign Modal open and filled]**

**Table 4.9 Invest Module + Paynow**

| **Test Case ID** | **Description** | **Data** | **Expected Result** | **Result** |
| --- | --- | --- | --- | --- |
| Invest01 | Invest using EcoCash test number | 0777777777 | Redirect to Paynow, NFT minted on confirmation | Pass |

**[Insert Screenshot: Investment modal, and Paynow redirect]**  
**[Insert Screenshot: NFT minted view + OpenSea link]**

**Table 4.10 Admin Dashboard Approvals**

| **Test Case ID** | **Description** | **Data** | **Expected Result** | **Result** |
| --- | --- | --- | --- | --- |
| Admin01 | Approve Campaign | Pending campaign | Campaign becomes visible | Pass |
| Admin02 | Reject User | Unverified user | User marked as rejected | Pass |

**[Insert Screenshot: Admin campaign approval section]**

**4.6 Functionalities Summary Table**

| **Feature** | **Description** |
| --- | --- |
| Signup/Login | Auth with email + session |
| KYC Upload | Upload ID/Proof docs |
| Wallet Connect | Connect MetaMask wallet |
| Campaign Creation | Modal to launch campaigns |
| Campaign Approval | Admin approves/rejects |
| Investment | Invest using EcoCash or bank |
| NFT Minting | Mints ERC-721 NFT per investment |
| IPFS Integration | Stores metadata/images on IPFS |
| Token Visualization | View in MetaMask, OpenSea |
| Admin Panel | View/ban/approve users and campaigns |
| Paynow Integration | Real-world payment support |
| Blockchain Explorer Link | View transaction on Etherscan |
| Profile Stats | Investments, tokens, campaign count |
| Manual NFT import | Guide + copyable tokenID/address |
| Live Status Checks | Shows amount left before full funding |
| Email Notifications | For wallet link and KYC |
| Campaign Close Logic | Disabled investing once goal met |

**[Insert Screenshot: Admin bans a suspicious campaign]**  
**[Insert Screenshot: Profile page showing wallet address + KYC status]**

**4.7 Implementation Plan**

| **Strategy** | **Activity** | **Persons Involved** | **Duration** |
| --- | --- | --- | --- |
| Deployment | Setup and push to live server | Developer | 1 day |
| Paynow Integration | Test mode + go live | Developer + Paynow | 2 days |
| KYC + Wallet UX | UI walkthroughs | Developer + QA | 2 days |
| Monitoring | Live bug fixing | Developer | Ongoing |

**4.8 Findings & Drawbacks**

* **Successes**:
  + Seamless blockchain + fiat integration
  + NFTs minted and viewable on OpenSea
  + Campaign funding locks after goal met
* **Issues Encountered**:
  + Paynow test mode errors (invalid numbers, auth email mismatch)
  + NFTs not showing on mobile MetaMask without manual import
  + Campaign modal failed when hidden fields remained required

**4.9 Evaluation & Interpretation**

* System passed over 20+ end-to-end test cases.
* Realistic investor flow tested:
  + Paynow success → auto minting → DB write
  + Rejected campaigns not shown publicly
* Admin can ban and unban users/campaigns.

**[Insert Screenshot: System flow diagram or DB architecture]**

**4.10 Recommendations**

* Add:
  + **Auto withdrawal** logic for creators
  + **Multi-chain** support (Polygon)
  + Analytics module (investor trends)

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