CHAPTER 4: RESULTS AND DISCUSSION

This section presents the technical implementation, testing outcomes, and evaluation of the Decentralized Investment Crowdfunding Platform with Paynow Integration and NFT Certificates. The system was developed to address critical gaps in traditional investment platforms by leveraging blockchain technology for transparency, automated compliance, and seamless fiat-to-crypto onboarding.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 Phone Web Browsers

|  |  |
| --- | --- |
| Hardware | Technical Rquirement |
| iOS | iOS 12.1+ with Safari 12+ or Chrome 89+ |
| Android | Android 7+ with Chrome 89+ |

## Table 4.3 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 Functional Modules and Implementation Results

This section presents and discusses the results obtained from implementing and testing all the functional modules in the decentralized investment platform. Each module was evaluated for correctness, robustness, and integration with blockchain and payment services.

## Table 4.3 Summary of Functional Modules

|  |  |  |
| --- | --- | --- |
| Module | Functionality | Technologies Used |
| User Registration and Login | User account creation, login, session tracking | Node.js, Passport, MongoDB |
| Profile Management | Edit profile, KYC upload, wallet address saving | EJS, Multer, MongoDB |
| Campaign Creation | Launch new campaign with tokenomics and documents | Form with dynamic JS, MongoDB |
| Campaign Display | Live campaign listings with filtering and progress | EJS, AOS, MongoDB |
| Admin Dashboard | Approve/Reject KYC and Campaigns, export data | Node.js, Admin-only middleware |
| KYC Verification | Upload, verify, show dynamic KYC status | MongoDB, Admin panel, User uploads |
| Token Minting | Generate ERC-721 tokens for investments | Solidity, ethers.js, IPFS, Pinata |
| Blockchain Ledger Logging | Record investment on-chain with campaignId, user, amount | Smart Contract, Hardhat |
| MetaMask Integration | Wallet connect, address capture, show tokens | Web3, MetaMask API, JS |
| Investment Flow | Handles investments with validation, token issuance | Node.js, Blockchain, MongoDB |
| Paynow Integration | Process fiat payments using EcoCash/Paynow | Paynow SDK, Custom route |
| NFT Display & OpenSea | View NFTs on OpenSea and MetaMask with manual ID | ERC-721, IPFS, OpenSea |
| Ratings & Reviews | Allow verified users and analysts to rate campaigns | Schema logic + UI filters |
| Campaign Status Logic | Automatically closes funded campaigns | Backend conditional logic |

# 4.3 Functional

Screenshots and Evidence of Functional Modules:

* User Registration and Login - Screenshot of registration form and successful login  
  [Insert Screenshot Here]
* Profile with Wallet + KYC - Profile page showing wallet and KYC sections  
  [Insert Screenshot Here]
* Campaign Launch - Modal with token fields and validations  
  [Insert Screenshot Here]
* Campaign View - List of campaigns with progress bars and invest buttons  
  [Insert Screenshot Here]
* Admin Dashboard - Page showing users/campaigns with Approve/Reject options  
  [Insert Screenshot Here]
* NFT Minting Confirmation - Flash message + OpenSea link + blockchain tx  
  [Insert Screenshot Here]
* Paynow Payment - Redirect to mobile payment and payment confirmation  
  [Insert Screenshot Here]
* Token in Wallet - MetaMask screenshot showing connected token  
  [Insert Screenshot Here]
* Ratings and Reviews - UI elements for rating campaigns  
  [Insert Screenshot Here]
* Investment Ledger - View transaction on Etherscan  
  [Insert Screenshot Here]