Decentralized Crowdfunding Dapp

A decentralized crowdfunding platform built on **Polygon Amoy Testnet**.
Users can **create campaigns, donate in MATIC, and earn NFT badges** (Bronze / Silver / Gold) as rewards.
The project has a **Solidity smart-contract backend**, an **Express + MongoDB API**, and a **React frontend** with wallet connection.

Demo Flow

1. Creator connects wallet → creates campaign.
2. Donors select campaign → donate MATIC → receive NFT badge if eligible.
3. Dashboard displays raised funds & donor NFTs.
4. Campaign creator can withdraw funds if the goal is met before deadline.
5. If not met, donors can claim refunds automatically.

Key Features

- Create campaigns with title, description, category, goal & deadline.
- Donate MATIC on **Polygon Mumbai** via MetaMask.
- Automatic refund if campaign goal isn't met before deadline.
- NFT reward badges (Bronze ≥10 MATIC, Silver ≥20, Gold ≥30).
- Donor dashboard shows earned NFTs.
- Real-time progress bar and deadline countdown.
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1.Software to install:

* Node.Js

* npm

* Ganache/ Hardhat local node

* Git

* MongoDB community Server

* MetaMask browser extension

* VS code/ Any IDE

*Project Setup:

#1. create project folder

mkdir crowdfund-dapp&& cd crowdfund-dapp

2. Initialize Hardhat project

npm init-y

npm install--save-dev hardhat
@nomicfoundation/hardhat-toolbox
@openzeppelin/contracts dotenv ethers

3. Create backend folder

cd backend

npm init-y

npm install express mongoose cors dotenv ethers

4. Create frontend React app

cd ..

npx create-react-app frontend

cd frontend

npm install ethers axios

2.Recommended Skills:

* Basic Solidity

* Basic JavaScript/ Node.js

*Command Prompt

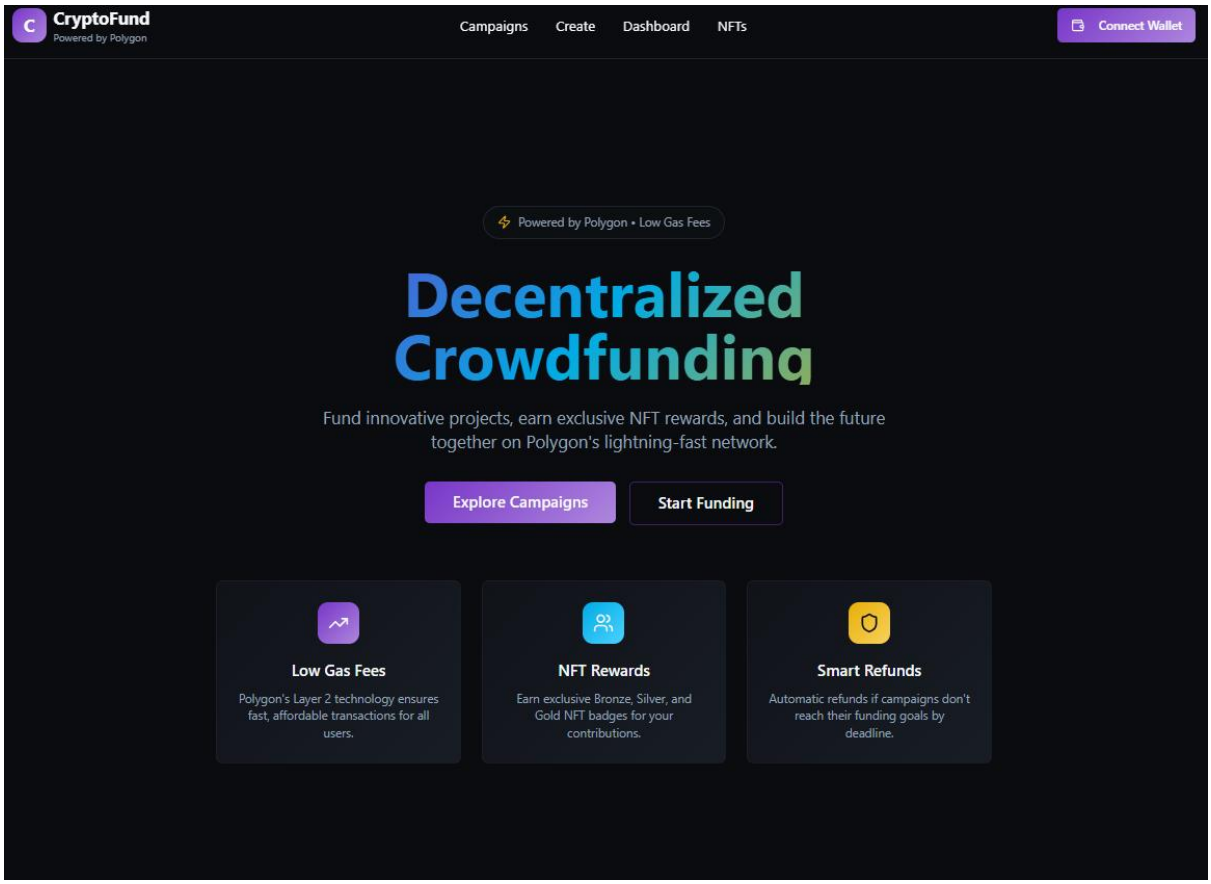
* MongoDB usage

* How to run npm install, npx hardhat compile, npx hardhat run

3.Folder Structure:

```
crowdfund-dapp/
├─ contracts/
│  ├─ Crowdfund.sol
│  └─ RewardNFT.sol
├─ hardhat/
│  ├─ hardhat.config.js
│  └─ scripts/deploy.js
├─ backend/
│  ├─ package.json
│  ├─ server.js
│  ├─ models/
│  │  ├─ Campaign.js
│  │  └─ Donor.js
│  ├─ abis/
│  │  ├─ Crowdfund.json
│  │  └─ RewardNFT.json
├─ frontend/
│  ├─ package.json
│  ├─ public/
│  │  └─ index.html
│  └─ src/
│     ├─ index.js
│     ├─ App.jsx
│     ├─ components/
│     │  ├─ CreateCampaign.jsx
│     │  ├─ CampaignPage.jsx
```

** Demo Architecture



Home Page – Decentralized Crowdfunding Overview

Explanation:

- This is the **landing page** of the DApp. It introduces the platform and its core purpose — enabling decentralized crowdfunding using blockchain technology.

- Users can explore campaigns or start their own with just one click.

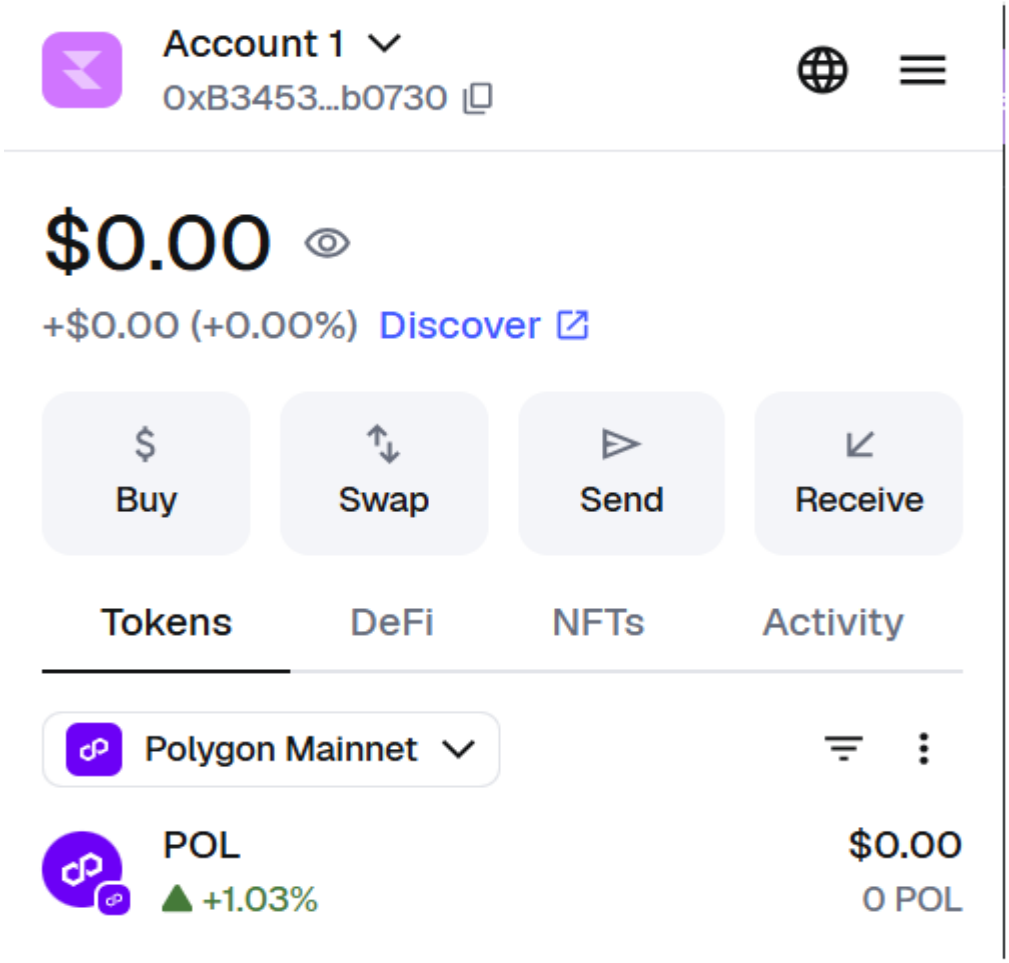
Key Features:

- **Decentralized Crowdfunding:** Showcases the platform's mission to support innovative projects through transparent, blockchain-based funding.
- **Explore Campaigns / Start Funding:** Clear call-to-action buttons to browse ongoing projects or launch new ones.
- **Polygon Benefits Section:**
    - **Low Gas Fees:** Fast and affordable transactions using Polygon Layer 2 (~$0.01 per transaction).
    - **NFT Rewards:** Contributors receive Bronze, Silver, or Gold NFT badges based on their contributions.
    - **Smart Refunds:** If a project doesn't reach its goal, smart contracts automatically refund contributors.

Purpose in Project:

This page acts as the **entry point** of the platform, educating new users on how decentralized

crowdfunding works and encouraging them to explore or launch projects.



MetaMask Wallet Interface (Polygon Network)

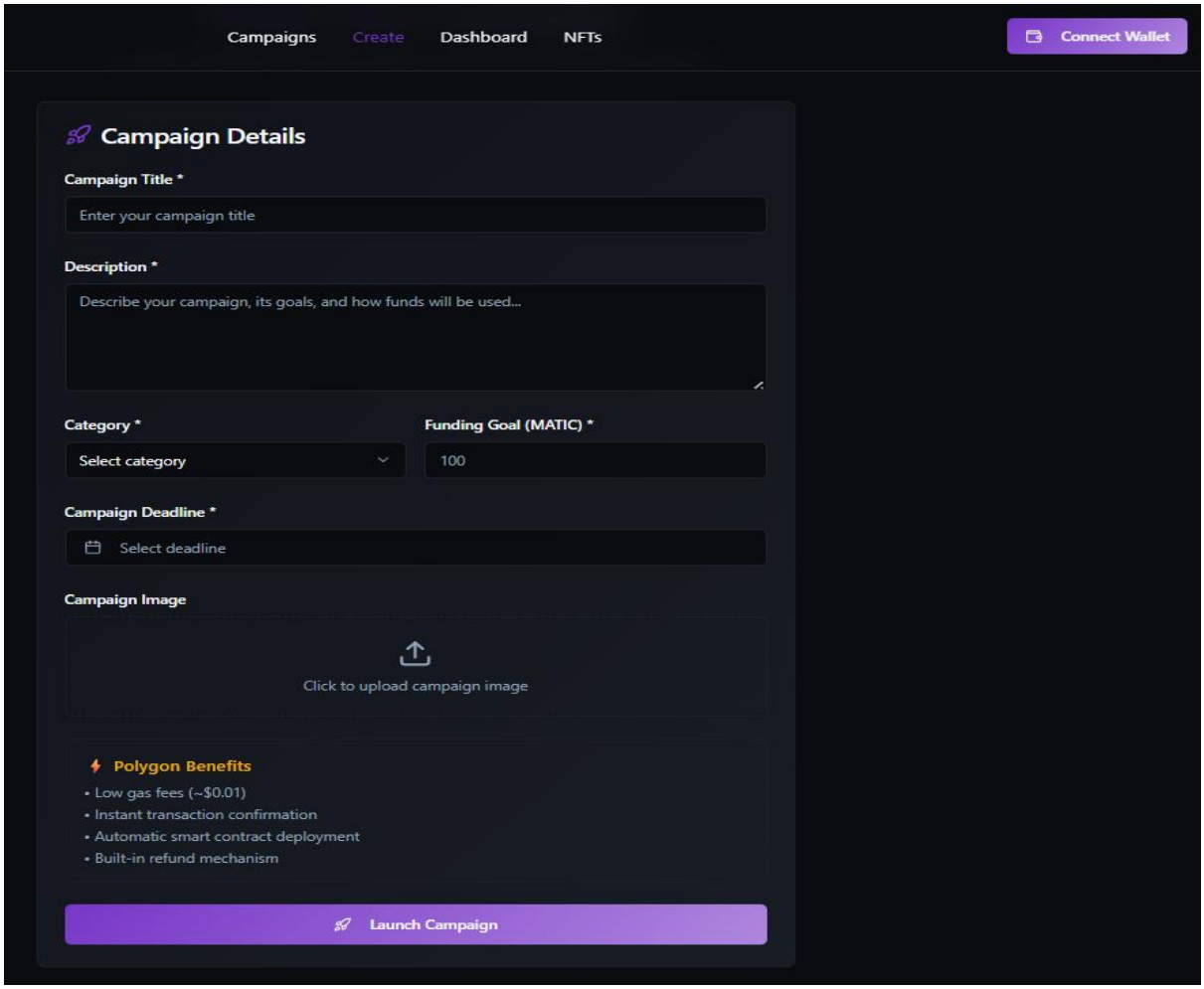
Explanation:

- This image shows the **MetaMask wallet** connected to the **Polygon Amoy**.
- It displays:
  - **Account address:** 0xB3453...b0730 (partially shown for privacy).

- **Balance:** $0.00, with no POL tokens currently held.
- **Main functions:** Buy, Swap, Send, and Receive tokens.
- **Token list:** It shows the **POL token** (the native token of the Polygon network).

Purpose in the project:

- Demonstrates **wallet integration** with the crowdfunding DApp.
- Users connect their MetaMask wallet to:
  - Fund projects using MATIC or POL.
  - Create campaigns.
  - Receive funds directly to their wallet.
- Shows **secure, decentralized user authentication** (no username/password needed).



Create Campaign Page

Explanation:

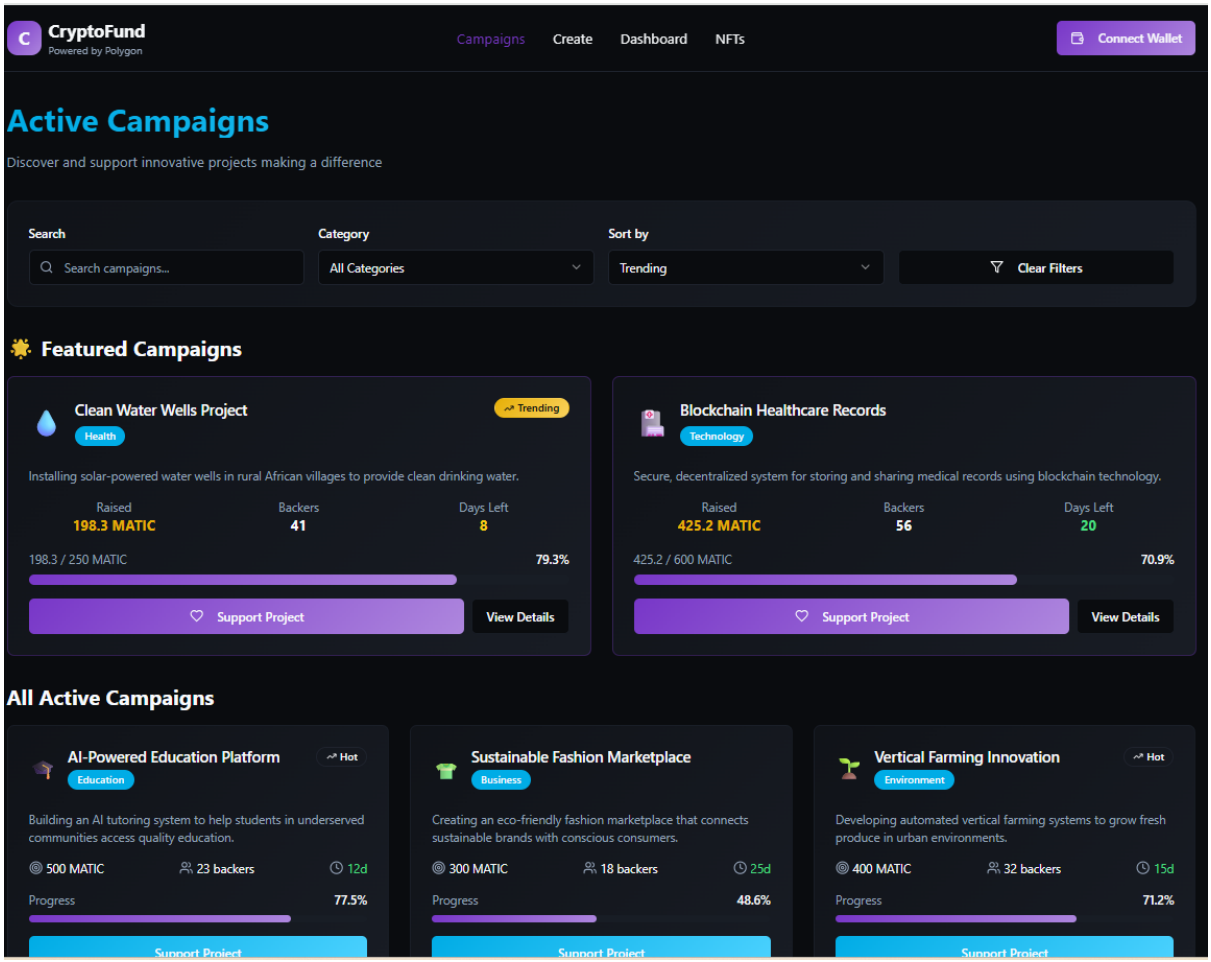
- This is the **“Create Campaign” form** within your DApp.
- Fields include:
    - **Campaign Title:** Name of the fundraising project.

    - **Description:** Purpose, goals, and fund usage details.
    - **Category:** Type of campaign (e.g., Health, Education, Technology).
    - **Funding Goal (in MATIC):** The target amount to raise.
    - **Campaign Deadline:** End date for fundraising.
    - **Campaign Image:** Visual to represent the campaign.
- The bottom section lists **Polygon Benefits** such as:
    - Low gas fees (~$0.01)
    - Instant transactions
    - Automatic smart contract deployment
    - Built-in refund mechanism
- The **“Launch Campaign”** button deploys a **smart contract** to start the campaign.

Purpose in the project:

- This page shows how users can **create and launch new crowdfunding campaigns** directly on the blockchain.

- It highlights **decentralized fund management**, where campaigns are transparent and governed by smart contracts



Active Campaigns Page

Explanation:

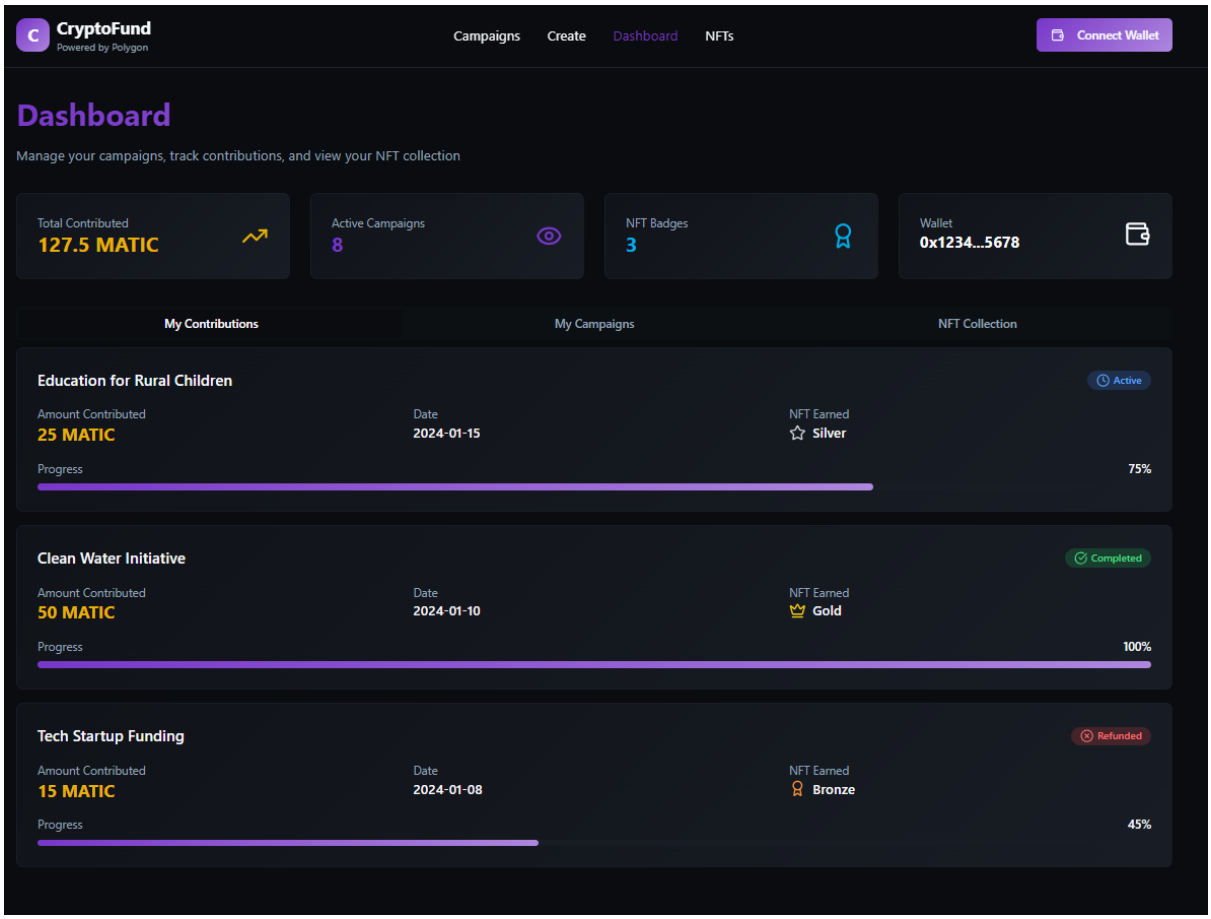
- This screen shows the **main campaign dashboard** displaying **active and featured campaigns**.
- Includes:

- **Search & Filter Options:** Users can search by name, category, or sort by trends.
- **Featured Campaigns:** Highlighted projects like:
  - *Clean Water Wells Project*
  - *Blockchain Healthcare Records*
- **Campaign Details:**
  - Amount raised (e.g., 198.3/250 MATIC)
  - Number of backers
  - Days left
  - Progress bar showing fundraising status
- **Action Buttons:** “Support Project” and “View Details”
- **All Active Campaigns:** Additional campaigns listed by category (Education, Business, Environment, etc.)

Purpose in the project:

- Displays **live campaigns** users can contribute to.
- Demonstrates **transparency** — anyone can see how much has been raised and how many backers are involved.

- Shows **community-driven funding** using blockchain-based smart contracts.



Dashboard Page – User Contributions & Campaign Status

Explanation:

- The **Dashboard** is a personalized page where users can manage their crowdfunding activities — contributions, campaigns, and NFT rewards.

Key Components:

- **Total Contributed:** Total MATIC a user has funded across all campaigns.
- **Active Campaigns:** Number of campaigns the user is currently supporting.
- **NFT Badges:** Total NFTs earned as contribution rewards.
- **Wallet:** Displays the connected wallet address.

Tabs:

- **My Contributions:** Detailed list of supported projects with:
    - Amount contributed and date
    - Progress bar and campaign status (Active, Completed, Refunded)
    - NFT badge received (Bronze, Silver, Gold)
- **My Campaigns:** (If user is a creator) – shows campaigns launched by them.
- **NFT Collection:** Shows all contribution-based NFTs.

Purpose in Project:

The dashboard is the **user's control center** — it tracks funding activity, campaign progress, earned rewards, and provides a transparent funding history.

Smart Contracts Overview

1.Crowdfund.sol

Handles campaign creation, donations, withdrawals, and refunds.

Emits events for CampaignCreated, DonationReceived, RefundIssued, etc.

2.RewardNFT.sol

Mints NFTs as donation rewards.

Uses ERC721 standard from OpenZeppelin.

Stores metadata (IPFS tokenURI) for each badge.

Project Summary: Decentralized Crowdfunding DApp with NFT Rewards

The Decentralized Crowdfunding DApp is a blockchain-based platform built on the Polygon Mumbai Testnet that enables transparent, secure, and automated crowdfunding using smart contracts. The system eliminates intermediaries, allowing campaign creators to raise funds directly from the community while rewarding donors with NFT badges based on their contribution levels.

Campaign creators can easily launch fundraising campaigns by specifying essential details such as title, description, category, funding goal, and deadline.

Donors contribute MATIC tokens, and the smart contract automatically enforces campaign rules:

If the funding goal is reached before the deadline, the campaign creator can withdraw the funds.

If the goal is not met by the deadline, donors can claim automatic refunds.

The NFT Reward Mechanism provides additional incentives — donors receive collectible NFTs as recognition for their support:

Bronze Badge for donations ≥ 10 MATIC

Silver Badge for donations ≥ 20 MATIC

Gold Badge for donations ≥ 30 MATIC

Each NFT tier may also unlock perks such as early access to campaigns or governance rights in future versions.

The project includes a React.js frontend integrated with MetaMask, a Node.js + Express backend for API and database management, and Solidity smart contracts deployed via Hardhat on the Polygon Mumbai Testnet.

This prototype demonstrates how decentralized applications (DApps) can modernize crowdfunding by improving trust, transparency, and user engagement using blockchain and NFTs.