

S25-009-D-Nexa Fund

Project Team

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Chapter 1

1. Introduction

Crowdfunding has transformed the way individuals and businesses raise capital for projects, innovations, and social causes. Platforms like **Kickstarter, Indiegogo, and GoFundMe** have made it possible for entrepreneurs, artists, and social activists to connect with potential backers who support their vision. However, despite the success of these platforms, **trust issues, fraud risks, high platform fees, and fund mismanagement** remain critical concerns.

Nexa Fund is a blockchain-powered crowdfunding platform that addresses these challenges by leveraging **smart contracts, milestonebased fund releases, decentralized fraud prevention, and AI-powered campaign recommendations**. Unlike traditional crowdfunding platforms that rely on centralized control, Nexa Fund ensures **transparency, security, and fairness** through **decentralized fund management** and **community-driven fraud detection mechanisms**.

This proposal outlines the motivation, challenges, and solutions offered by Nexa Fund, along with the project's scope, technical implementation, and expected outcomes.

1.1 Problem Statement

Crowdfunding has democratized fundraising, but it has also introduced critical vulnerabilities that limit its effectiveness. Some of the major issues in the current crowdfunding landscape include:

- **Lack of Trust in Fund Usage:**

Once backers contribute funds to a campaign, they have no control or guarantee that the funds will be used as promised. Many projects fail to deliver on their commitments, resulting in frustration and financial losses for backers.

- **Fraudulent Campaigns:**

Many crowdfunding platforms have become breeding grounds for scams where campaign creators exploit the system to raise funds for fake or low-effort projects.

- **Centralized Control and Platform Manipulation:**

Traditional crowdfunding platforms like Kickstarter and GoFundMe operate on a centralized model, meaning they have the authority to block, promote, or reject campaigns at their discretion.

- **High Transaction and Platform Fees:**

Web2 crowdfunding platforms charge between five to ten percent in platform fees, making fundraising more expensive for creators. Additionally, payment processing fees further reduce the amount that reaches the campaign owner.

- **Limited Backer Protection:**

Once a campaign reaches its funding goal, backers have no recourse if the creator misuses the funds or fails to deliver.

- **Lack of Intelligent Discovery Mechanisms:**

Existing platforms do not effectively recommend campaigns to backers based on their interests, which limits engagement and funding opportunities for lesser-known projects.

How Nexa Fund Solves These Problems

Nexa Fund reimagines crowdfunding by utilizing blockchain and AI technologies to introduce a secure, fraud-resistant, and transparent fundraising system.

- **Milestone-Based Fund Release**

Instead of releasing all funds upfront, Nexa Fund holds contributions in a smart contract and releases funds in phases based on backer-approved milestones.

- **Decentralized Fraud Prevention**

A multi-layered fraud detection system is integrated, including prelaunch risk scoring, community reporting, and milestone investor voting to prevent scams.

- **Blockchain-Powered Transparency**

Fund transactions are recorded on a public ledger, ensuring full visibility into how funds are collected and distributed.

- **Lower Transaction Costs**

Nexa Fund runs on Polygon L2, significantly reducing transaction and platform fees.

- **AI-Powered Campaign Recommendations**

A collaborative filtering model recommends relevant campaigns to backers based on their preferences and funding history.

By addressing these fundamental issues, Nexa Fund enhances trust, accountability, and efficiency in the crowdfunding ecosystem.

1.2 Motivation

The need for trust and security in crowdfunding has never been more pressing. Crowdfunding fraud has cost backers millions of dollars, and many legitimate creators struggle to secure funding due to concerns over fund misuse. Nexa Fund is designed to tackle these challenges and restore confidence in the crowdfunding process.

Some key motivations behind this project include:

1. Ensuring Fair and Secure Fund Management:

Backers need assurances that their contributions will be used correctly. By implementing milestone-based fund disbursement, Nexa Fund ensures that campaign creators receive funds only when predefined goals are met. This prevents misuse of funds and increases accountability.

2. Reducing Fraud and Scam Campaigns:

Nexa Fund introduces a three-layered fraud prevention system:

- Risk Scoring System (Pre-Launch) – Campaigns undergo automated screening based on credibility factors before launch.
- Community Reporting (Post-Launch) – Verified backers can report suspicious campaigns, and flagged campaigns are reviewed by the admin.

- Milestone Investor Voting (Fund Release Protection) – Funds are only released when backers vote to approve milestone completion.

3. Lowering Fees and Increasing Accessibility:

Traditional platforms take a significant cut of the funds raised. Nexa Fund reduces costs by leveraging blockchain technology (Polygon L2), where transaction fees are significantly lower than Web2 platforms. This makes crowdfunding more accessible to smaller creators.

4. AI-Driven Personalization for Better Engagement:

One of the biggest challenges in crowdfunding is that many campaigns fail due to low visibility. Nexa Fund employs AI-powered recommendations to match backers with campaigns that align with their interests. This increases backer engagement and helps legitimate creators gain traction.

5. Creating a Research-Worthy, Future-Ready Platform:

Nexa Fund is not just an FYP project; it is a practical, research-driven implementation of Web3 and AI technologies that can be expanded into a real-world product. The project combines:

- Blockchain Development (Solidity, Smart Contracts, Ethers.js)
- AI Recommendations (Collaborative Filtering, Python, FastAPI)
- Web3 Integration (MetaMask, WalletConnect)
- Decentralized Storage (IPFS)

This makes Nexa Fund a high-value project for both academic research and industry relevance.

1.3 Problem Solution

Nexa Fund is a Web3-powered crowdfunding platform that integrates blockchain security, AI intelligence, and community-driven fraud prevention to create a trustworthy fundraising ecosystem.

How It Works

1. Users create campaigns – Campaign creators register and submit detailed funding proposals with milestones.
2. Pre-Launch Risk Scoring – The system assigns a fraud risk score based on predefined factors. High-risk campaigns are flagged for manual review.
3. Crypto-Based Contributions – Backers fund campaigns via MetaMask/WalletConnect with low gas fees (Polygon L2).
4. Funds Held in Escrow – Contributions are locked in a smart contract until milestone completion.
5. Milestone-Based Fund Release – Backers vote to approve fund disbursement at each milestone.
6. Post-Launch Community Reporting – Verified backers can report fraud, triggering admin review.
7. AI Recommendations Enhance Engagement – The platform suggests relevant campaigns based on user interest.

By integrating secure fund management, fraud prevention, and AI-powered discovery, Nexa Fund ensures a safe, transparent, and effective crowdfunding experience.

1.4 Stakeholders

Nexa Fund serves a diverse group of users, each benefiting from its decentralized and AI-enhanced model:

- **Campaign Creators** – Individuals or businesses seeking funding for projects.
- **Backers (Investors)** – Users who contribute funds to support projects.
- **Platform Administrators** – Responsible for overseeing flagged campaigns and milestone approvals.
- **Regulatory Entities** – Ensures compliance with legal crowdfunding frameworks

Chapter 2

2. Project Description

In this chapter, we provide a detailed breakdown of **NexaFund**, its functionalities, core modules, and technical aspects. Our goal is to present a clear and structured overview of what our project entails, how we plan to implement it, and the technologies we will leverage.

2.1 Scope

NexaFund is a **decentralized crowdfunding platform** designed to provide **security, transparency, and fraud prevention** in fundraising campaigns. Unlike traditional crowdfunding systems, which rely heavily on centralized trust, NexaFund integrates **blockchain smart contracts** to ensure **milestone-based fund releases** while using **AI-powered recommendations** to enhance user engagement.

Our primary focus is on creating an **MVP (Minimum Viable Product)** that demonstrates the feasibility of a **trustless and decentralized crowdfunding model** while keeping the platform user-friendly. The key features of our platform include:

- **Campaign Creation & Fundraising**

Users can create crowdfunding campaigns with **pre-defined milestones** that dictate when funds will be released.

- **Milestone-Based Fund Release**

Instead of releasing all collected funds at once, our system holds them in a **smart contract escrow** on **Polygon L2**. Funds are only released upon **backer approval**.

- **Fraud Prevention System**

A **multi-layered fraud detection mechanism** ensures that **scams are prevented** at different stages:

1. **Pre-Launch Validation:** A **risk-scoring system** determines the legitimacy of campaigns before they go live.
2. **Post-Launch Monitoring:** Verified backers can **report suspicious campaigns**, triggering an admin review.
3. **Fund Release Protection:** Backers vote on whether milestones are completed before funds are released.

- **AI-Powered Recommendations**

Using **collaborative filtering**, the system recommends **relevant campaigns** to backers.

- **Decentralized Storage & Data Management**

Campaign metadata and images are stored on **IPFS** for security and immutability.

- **Web3 Wallet Integration**

Users will authenticate using **MetaMask or WalletConnect**, ensuring seamless and secure transactions.

This MVP will **not** include complex governance models or AI-driven fraud detection, but it lays the foundation for future scalability.

2.2 Modules

NexaFund is structured into several core modules, each contributing to the overall functionality of the system.

2.2.1 Blockchain Crowdfunding Module

This module is responsible for handling **campaign creation, fundraising, and milestone-based fund releases**. It includes:

1. **Smart Contract Deployment** – Automatically manages fund allocation, milestone approvals, and disbursement.
2. **Escrow Wallet System** – Holds contributions securely on **Polygon L2** until milestones are approved.
3. **Milestone-Based Voting** – Backers vote to decide whether a milestone is complete before releasing funds.

2.2.2 Fraud Prevention Module

This module provides **multiple layers of fraud protection**:

1. **Pre-Launch Risk Scoring** – Assigns a **fraud risk score (0-100)** before a campaign goes live.
2. **Community Reporting System** – Verified backers can **report** fraudulent campaigns.
3. **Milestone Voting System** – Ensures that funds **are only released upon approval** by the backers.

2.2.3 AI-Powered Recommendation Module

This module improves **user engagement** by recommending relevant campaigns based on user preferences. Features include:

1. **Collaborative Filtering Algorithm** – Suggests campaigns based on backers' past interests.
2. **Trending Campaigns Section** – Displays the most active and highperforming campaigns.

2.2.4 Web3 Authentication & Transactions

This module ensures secure interactions through **blockchain wallets**:

1. **MetaMask & WalletConnect Integration** – Enables users to log in and transact securely.
2. **Smart Contract Interaction Layer** – Facilitates **contributions, voting, and milestone approvals**.

2.2.5 User Dashboard & UI Module

A seamless UI for tracking contributions, managing campaigns, and interacting with the fraud prevention system. Key features:

1. **Campaign Browsing & Contribution Flow**
2. **Transaction History & User Dashboard**
3. **AI-Driven Campaign Recommendations**

2.3 Tools and Technologies

Category	Technology Stack	Purpose
Frontend	React.js + Tailwind CSS	Modern UI framework for seamless user experience.
Backend	Nest.js (Node.js + TypeScript)	Secure API management and business logic handling.
Blockchain	Ethereum (Polygon L2) + Solidity	Ensures decentralized trust and low gas fees.
Web3 Library	Ethers.js	Interacts with blockchain smart contracts.
Wallets	MetaMask, WalletConnect	Enables secure login and transactions.
Database	MongoDB + PostgreSQL	Hybrid storage system for campaign data and financial records.
Decentralized Storage	IPFS	Ensures campaign metadata remains immutable and accessible.
Fraud Prevention	Rule-Based Risk Scoring, Community Reporting, Investor Voting	Prevents fraudulent activity without AI complexity.
AI Recommendations	Scikit-Learn (Collaborative Filtering)	Provides personalized campaign suggestions.
AI API Backend	FastAPI (Python)	Efficient AI processing for recommendations.
Hosting	Vercel (Frontend), AWS/DigitalOcean (Backend), Polygon L2 (Blockchain)	Ensures a scalable and cost-effective solution.

Table 1

2.4 Work Division

Team Member	Primary Responsibility	Shared Responsibility
Shabi	Blockchain Development & Security	Frontend & Web Development (UI/UX, Web3 Integration, Dashboard)
Shahzain	Blockchain Development & Smart Contract Management	Frontend & Web Development (Smart Contract Interaction, Wallets, Escrow)
Anas	AI-Powered Recommendation System	Frontend & Web Development (AI Integration, Recommendation UI, User Experience)

Table 2

2.5 TimeLine

Iteration	Focus Area	Key Tasks
Iteration 1 (Weeks 1-8)	Design, Planning & Initial Setup	<p>Project Planning & UI/UX Design:</p> <ul style="list-style-type: none">- Establish foundational design elements- Define key workflows and system interactions <p>Initial Blockchain Setup & Web3 Authentication:</p> <ul style="list-style-type: none">- Develop base architecture for smart contracts- Implement user authentication mechanisms <p>Preliminary Backend & API Development:</p> <ul style="list-style-type: none">- Set up the system structure and data flow

		<ul style="list-style-type: none"> - Design early-stage API endpoints and interactions
Iteration 2 (Weeks 9-16)	Core Development & Security Enhancements	<p>Core System Development:</p> <ul style="list-style-type: none"> - Implement essential platform functionalities - Enhance security mechanisms and performance <p>Fraud Prevention & Trust Mechanisms:</p> <ul style="list-style-type: none"> - Develop foundational fraud detection layers - Establish early-stage review and monitoring features <p>User Interface & Experience Enhancements:</p> <ul style="list-style-type: none"> - Expand frontend features and interactions - Improve system feedback and user engagement

Iteration 3 (Weeks 17-24)	Advanced Integrations & System Refinements	Advanced System Integration: <ul style="list-style-type: none"> - Incorporate AI-driven enhancements - Optimize backend interactions and processing Blockchain & Security Refinements: <ul style="list-style-type: none"> - Strengthen smart contract
		capabilities <ul style="list-style-type: none"> - Improve data handling and transaction processing Expanded User & Admin Controls: <ul style="list-style-type: none"> - Develop additional monitoring and management tools - Ensure seamless platform interactions
Iteration 4 (Weeks 25-32)	Final Testing, Optimization & Deployment	Final Testing & Quality Assurance: <ul style="list-style-type: none"> - Conduct extensive security and usability tests - Review and optimize all system components Deployment & Post-Launch Preparations: <ul style="list-style-type: none"> - Deploy system to live environment - Implement final user experience improvements - Prepare supporting documentation and knowledge base

Table 3

2.6 Comparative Analysis

FEATURES	NEXAFUND	BETTER-FUND	CROWD-FUND SOLAR	KICK-STARTER	BLOCK FUND
SMART CONTRACT SECURITY	Polygon L2 + Oracles	Ethereum	Basic Blockchain	None	Blockchain-based Smart Contracts
FRAUD PREVENTION	Multi-Layer Fraud Detection	Community Voting	Basic Checks	Manual Review	Manual Review
FUND RELEASE METHOD	Escrow Based Verified Milestones	50% Voter Approval	Project Complete	All-or-Nothing	Escrow for Real Estate Transactions
PROJECT DISCOVERY	AI Recommendations	Manual Search	Category Browse	Manual + Categories	Limited Discovery (Real Estate Only)

COST STRUCTURE	Gas Only (Low)	High Fees	Gas	Medium Gas Fees	5% + 3-5%	Transaction Fees
REACH	Global	India		Africa Focus	Limited	Region-Specific

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