

High-Level Design Document (HLDD) – AI Trading Platform

1. System Overview

A modular, AI-driven trading platform designed for active retail traders and institutional strategy developers. It provides real-time strategy generation, backtesting, and execution using integrated AI, middleware, and blockchain-secured data trails.

2. Architecture Overview

- **Frontend:** React + Tailwind UI for performance dashboards, onboarding wizard, and trading assistants
- **Backend:** Flask REST APIs, modular blueprint structure
- **Middleware:** Unified gateway to TradingView, MetaTrader, ThinkOrSwim
- **Security:** Photonic blockchain gateway + AI-driven NIDR agent
- **AI Stack:**
 - Supervised learning models for indicator tuning
 - Reinforcement Learning (RL) agent for continuous optimization
- **Storage:** PostgreSQL, NoSQL for strategy cache, cold wallet crypto layer

3. Modules

3.1 Authentication & Access Control

- Role-based access: trader, investor, admin
- Stripe integration for subscription management

3.2 Strategy Builder

- AI-assisted 5-step wizard
- Drop-in indicators, pattern logic, news triggers

3.3 RL Agent & Backtester

- Custom reward function tuning
- Live market simulation and model retraining

3.4 Profit Allocation Engine

- Yield pool creation and assignment
- Staking and performance-based split distribution

3.5 Blockchain Audit Layer

- Immutable trading history logging
- Asset routing and investor transparency

4. Development Phases

- **Phase 1:** Authentication + Dashboard layout
- **Phase 2:** Modular backend + API gateway
- **Phase 3:** Investor onboarding content + demo deck
- **Phase 4:** AI strategy builder UI + training logic
- **Phase 5:** RL agent deployment + feedback loop
- **Phase 6:** Reporting system + megatrend integration
- **Phase 7:** Production deployment + UI polish

5. Business Model & IP Strategy

- Tiered SaaS pricing: Free / Pro / Institutional
- Multiple IP claims: onboarding assistant, RL feedback pipeline, secure audit stack
- Investor demo portal + partner license terms

6. Pending Tasks

- Finalize AI onboarding UX
- Complete full static demo site with tier selection
- Secure domain + finalize CI/CD for hosting
- Patent flowchart packaging + IP advisory sync