AI-Powered Trading Platform - Phase 5 Summary

# Overview

Phase 5 introduced advanced AI capabilities and strategic tooling to the trading platform. This included the integration of a Deep Q-Network (DQN) reinforcement learning agent, a complete backtesting system, REST API endpoints, and UI components for strategy configuration and evaluation. The goal was to empower users to leverage AI-driven trading strategies and validate them on historical market data.

# Completed Deliverables

* ✅ DQN RL Agent: Implemented using PyTorch with replay buffer and target network synchronization.
* ✅ Strategy Simulation Integration: DQNAgent integrated with historical and live trading environments.
* ✅ Backtesting Service: Generates equity curve, Sharpe ratio, drawdowns, and trade logs; supports CSV export.
* ✅ API Endpoints: `/api/rl\_models` for training/evaluation, `/api/backtest` for strategy validation.
* ✅ UI Components: `RLConfigPanel.jsx`, `BacktestPanel.jsx`, `RLDashboardPage.jsx` with real-time feedback.
* ✅ Testing Suite: Manual and automated validation of model and UI logic.
* ✅ Documentation: Phase 5 implementation, usage guide, and future expansion roadmap.

# Summary

Phase 5 marked a major leap forward in platform intelligence and user engagement. With reinforcement learning capabilities and a robust backtesting engine, users can now craft and validate adaptive strategies. This phase establishes the foundation for future enhancements including advanced RL algorithms, investor dashboards, and beta deployment in Phase 6.