Blockchain Prediction Market - Product Specification & Technical Architecture

Product Vision

A crypto-native prediction market where users trade YES/NO outcome shares on real-world events. Markets are tokenized as conditional ERC-1155 assets, collateralized in USDC (Polygon), and resolved by an optimistic oracle with transparent dispute windows.

Personas

- Player/Trader
- Admin/Market-Maker
- Risk/Compliance Analyst

Success Metrics

- Time-to-first-trade < 2 minutes
- Slippage within configured maximum
- 99% market resolutions inside SLA
- <0.1% failed withdrawals

Scope

MVP: Wallet sign-in, binary markets, AMM, UMA oracle, dashboards.
V1+: Categories, affiliates, auto-market creation, KYC tiers.

Market & Token Design

ERC-1155 outcome tokens on Polygon, collateralized by USDC. AMM (CPMM/FPMM). UMA Optimistic Oracle for settlement.

User Flows

Onboarding, Funding, Discover & Trade, Post-trade portfolio, Resolution, Dispute handling.

Admin & Back-office

Dashboards, User mgmt, Market mgmt, Reporting, Dispute queues.

Smart Contract Architecture

MarketFactory, Market contracts, ERC-1155 outcome tokens, OracleAdapterUMA, FeeRouter, Governance controls.

Off-chain Services

Indexer, Orderbook/Match Engine, Risk/Compliance Gateway, Notifications.

Data Model

Users, Wallet Events, Markets, Market Stats, Orders, Trades, Positions, Comments, Disputes, Reports.

API Spec

REST + WebSocket for markets, trading, user portfolio, admin actions.

Frontend

Next.js/React + wagmi. Pages: Landing, Market Detail, Portfolio, Admin portal.

Security & Risk Controls

Oracle disputes, Compliance (geo-blocking, KYC), Market rules, Limits, Funds safety.

Replit Repo Blueprint

apps/web (Next.js), apps/api (Node), packages/contracts (Hardhat), sdk, ui, infra. Prisma for DB.

Testing & Observability

Contract tests, API e2e, reconciliation, admin dashboards.

Roadmap

Auto-market feeds, advanced risk controls, L2, on/off-ramp, governance.