Solana Prediction Market — Technical Progress Summary

Overview

This document summarizes the current state of my Solana-based prediction market project, the work completed so far, and the next planned phases of development. The focus of the project has been on building a robust, idempotent, and production-safe backend architecture before moving into client-facing features.

Work Completed — On-Chain Program (Anchor v2)

Implemented a YES/NO CPMM prediction market using Anchor v2 with deterministic PDAs, full market lifecycle support, correct fee handling, and pro-rata winnings claims. The on-chain program is stable and feature-complete for MVP.

Blockchain Service (.NET 8 + Solnet)

Built a stateless Blockchain Service handling all Solana RPC interactions, including transaction construction, ATA creation, PDA derivation, simulation, confirmation polling, and structured Anchor error parsing.

Market Service (DDD Architecture)

Designed a Domain-Driven Market Service with clear separation of Domain, Application, and Infrastructure layers. Implemented idempotent orchestration via MarketActionExecutor and persisted request/response state using Postgres JSONB.

Idempotency and Reliability

Implemented mandatory Idempotency-Key handling with database-level uniqueness, retry-safe workflows, deterministic u64 market seeds, and natural idempotency via authority and seed pairing.

Current Known Issue

Market creation currently triggers a foreign key constraint violation because MarketAction rows are created before the Market exists. Planned fix is to allow nullable MarketId for Create actions and attach post-insert.

Planned Next Steps

Finalize Create flow, build Portfolio read-model service, add a minimal client for E2E validation, and complete authentication service integration.

Overall Assessment

The project is past the highest-risk phase. Core infrastructure, chain interaction, and reliability concerns have been addressed early, leaving primarily integration and UX work ahead.