

Why Flint Beats Building Your Own Prop AMM *by Adam Jannoud jannoud-adam@hotmail.com*

Abstract The Decentralized Finance (DeFi) ecosystem on Solana has seen a surge in the demand for Proprietary Automated Market Makers (Prop AMMs). However, building a Prop AMM from scratch presents severe technical and financial hurdles. This paper explores the programming complexities, infrastructural costs, and developmental delays associated with engineering a custom solution. It subsequently analyzes how the Flint protocol resolves these obstacles through its multi-maker architecture, pro-rata matching system, and comprehensive off-chain infrastructure, ultimately providing a superior, cost-effective framework for market makers.

1. The Difficulties of Building a Prop AMM from Scratch

Developing a proprietary Automated Market Maker on the Solana blockchain introduces significant programming complexities, capital requirements, and infrastructure management burdens.

Development Costs and Programming Complexities

- Engineering smart contracts in Rust for Solana, which includes developing the matching engine, pricing algorithms, liquidity pool management, and token trading logic, requires an estimated 3 to 4 months of dedicated development time .
- This smart contract engineering phase carries an estimated financial cost between \$36,000 and \$62,500 based on industry salary benchmarks .
- Integrating APIs with DEX aggregators such as Jupiter or OKX, testing transaction compression, and simulating price slippage requires an additional 4 to 6 weeks
- This integration and testing phase incurs an additional cost of \$10,000 to \$20,000 in engineering and operational overhead .

Security and Infrastructure Overhead

- Following development, smart contracts must undergo rigorous line-by-line security audits by specialized firms, taking 4 to 6 weeks to complete .

- These security audits represent a massive financial burden, costing anywhere from \$20,000 to over \$100,000 depending on protocol complexity .
- Establishing the necessary network infrastructure, specifically reserving and configuring dedicated RPC streaming nodes, costs between \$4,000 and \$11,600 for an initial four-month run .
- Ultimately, the complete path from initial planning to full mainnet readiness takes 4 to 6 months and demands a total capital expenditure ranging from ~\$70,000 to over \$194,000 .

To give you a more accurate breakdown of the costs, here is a table outlining the financial and time investment required for building a prop AMM from scratch:

Technical Component	Technical Details	Estimated Duration	Estimated Cost (USD)	Benchmark Source
Smart Contract Engineering (Rust/Solana)	Developing the matching engine, pricing algorithms, liquidity pool management, and token trading logic.	3 to 4 months	\$36,000 – \$62,500 (Pro-rated from an annual salary of \$145,000 to \$250,000)	Web3 Salaries Benchmark
Security Audit (Smart Contract Audit)	Line-by-line code review by specialized firms, addressing findings, and re-audit prior to deployment.	4 to 6 weeks	\$20,000 – \$100,000+ (Standard to complex DeFi protocol)	Accretion Solana Audit Report

Infrastructure & Network Nodes (RPCs)	Provisioning and configuring dedicated streaming nodes, and testing low-latency responsiveness for real-time data feeds (initial 4-month operational run).	1 to 2 weeks (followed by ongoing operations)	\$4,000 – \$11,600 (\$999 to \$2,900/month)	Helius RPC Pricing
Integrations & Environment Testing (Devnet to Mainnet)	Building APIs with aggregators (Jupiter/OKX), stress testing transactions, and simulating price slippage.	4 to 6 weeks	\$10,000 – \$20,000 (Engineering and operational overhead)	Financial Software Development Estimates (SDLC)
Total (Time-to-Market & Capital Expenditure)	End-to-end path from initial planning to full operational readiness on the mainnet.	4 to 6 months (with concurrent workstreams)	~\$70,000 to \$194,000+	—

How Flint Solves These Obstacles

The diagram illustrates the structural decoupling implemented by Flint to eliminate the high operational barriers typically associated with decentralized on-chain trading on Solana. The architecture is organized across three functional planes:

- **Client & Market Participant Plane:** Bridges market makers and retail traders directly into the exchange ecosystem. Market makers can quote and trade continuously without maintaining dedicated Remote Procedure Call (RPC) fleets or self-hosted indexers, while end-users avoid manual transaction construction and raw serialization.
- **Managed Off-Chain Supporting Stack:** Serves as an abstraction and data-distribution layer. It consolidates multi-language software development kits (SDKs), a low-latency gRPC gateway, high-frequency market-data feeds, historical indexing query layers, and operational analytics dashboards into a turnkey service. This layer manages the overhead of request routing, state synchronization, and transaction ingestion.

- **On-Chain Solana Execution Layer:** Houses the core exchange engine directly on Solana's native state machine. Order matching, atomic state transitions, and custody settlement occur entirely on-chain, preserving the trustless integrity, censorship resistance, and composability of a decentralized exchange.

HOW FLINT SOLVES TRADING OBSTACLES ON SOLANA

Fully On-Chain Matching & Settlement Paired with Turnkey Off-Chain Supporting Services

1. MARKET PARTICIPANTS (ZERO INFRASTRUCTURE OVERHEAD)

Market Makers

Quote & trade without deploying RPC fleets or custom indexers.
Zero operational server management required.

Traders & End Users

Never build or sign raw Solana transactions manually.
Drastically reduced programming complexity.

High-Speed Requests / Order Directives

2. FLINT MANAGED SUPPORTING STACK (OFF-CHAIN INFRASTRUCTURE)

Language SDKs

Pre-built libraries
for seamless coding
and rapid integration

gRPC Gateway

Low-latency streaming
interface for high-speed
order communication

Market-Data Feed

Real-time consolidated
orderbooks, live tickers,
and event streams

Historical Queries

Managed historical
indexing and query layer;
no database fleets

Ops & Dashboard

Real-time visibility,
operational analytics,
and health tracking

Automated Transaction Construction & RPC Routing

3. SOLANA BLOCKCHAIN (ENTIRELY ON-CHAIN)

Flint Exchange Engine (On-Chain)

Runs 100% natively on Solana decentralized network

- High-throughput on-chain order matching
- Trustless atomic settlement & state transitions
- Complete decentralization and self-custody

OBSTACLES ELIMINATED

- ❌ No Dedicated RPC Fleet Needed
- ❌ No Proprietary Indexer Needed
- ❌ No Manual Solana TX Serialization
- ✅ Drastically Lower Programming Complexity
- ✅ Zero Operational & Infrastructure Overhead

2. Advantages of the Multi-Maker Prop AMM Model

Traditional Prop AMMs often isolate liquidity, but Flint operates as a multi-entity proprietary AMM .

Unified Liquidity and Pro-Rata Matching

- Flint aggregates multiple private market makers into a single, unified virtual orderbook .
- When a trader executes a swap, the protocol dynamically builds a virtual book on the fly by merging all quoting intents from the makers .
- The protocol then fills makers proportionally (pro-rata) at each price level .

Flexibility and Autonomy

- This multi-maker structure provides unparalleled flexibility, allowing each maker to independently select their own quoting strategy, risk parameters, and cross-market pairs .
- Makers operate with autonomy and are not locked into one specific AMM curve or constrained by a single operator .

3. Features and Ease of Use for Institutions and Market Makers

Flint is designed to streamline operations for market makers through advanced tooling, robust SDKs, and efficient architectural design.

Advanced Quoting Strategies and Efficient Updates

- Flint provides three distinct on-chain quoting strategies: OrderList, OracleOffset, and LinearDistribution .
- The OracleOffset strategy allows makers to quote a fair anchor price alongside per-side delta vectors .
- This design ensures highly efficient pricing updates; makers can simply update a fair price and its offsets instead of rewriting the full order state, ensuring that quote refreshes remain cheap .

- Furthermore, liquidity is allocated dynamically at the time of the swap, allowing makers to publish quote levels that exceed their current inventory.

SDK Tooling and Seamless Integration

- To simplify algorithmic trading, Flint provides robust SDKs in Rust, Python, and TypeScript .
- These SDKs abstract away complex blockchain mechanics, allowing quoters to work entirely in human-readable units (e.g., standard price and token size) represented as decimal strings, while the SDK automatically handles conversion to on-chain integer forms at the boundary.
- The off-chain managed services supply makers with live order books, fills, snapshots, and ClickHouse-backed historical candles .
- By utilizing Flint's ready-made infrastructure, institutions bypass the 4 to 6 weeks of labor and up to \$20,000 in costs normally required to build custom aggregator integrations and testing pipelines .

Conclusion

Building a Prop AMM from the ground up on Solana requires months of development, expensive security audits, and complex infrastructure maintenance. Flint resolves these inefficiencies by offering a multi-maker Prop AMM model that features pro-rata liquidity distribution, highly efficient quote updates, and a managed off-chain infrastructure. By abstracting the heavy lifting of blockchain interactions and DEX integrations, Flint empowers market makers and institutions to focus purely on their quoting strategies and capital efficiency.

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