Project Close-out Report for: Open-Source Rapid DEX: Batcher-less, instant, with transaction chaining

Name of Project and Project URL on IdeaScale/Fund

- **Name:** Open-Source Rapid DEX: Batcher-less, instant, with transaction chaining
- **URL:** Project on IdeaScale
- **Project Number ID:** 1300153
- **Name of Project Manager:** Roman Majovsky
- **Date Project Started:** Jan 20, 2025
- **Date Project Completed:** July 29, 2025

List of Challenge KPIs and How the Project Addressed Them

1. **Decentralized Exchange Infrastructure:**
   Created a fully functional AMM DEX without a batcher, enabling direct pool interactions and seamless on-chain trade execution.
2. **Open Source Development:**
   All smart contracts, backend, and frontend codebases are publicly available on GitHub under an open license.
3. **Instant, Low-Fee Trading:**
   Removed the dependency on external batchers to eliminate slippage and reduce fees through direct user interaction with liquidity pools.
4. **Tooling for Developers and Users:**
   Delivered a real-time frontend UI with deep protocol analytics, developer-facing backend endpoints, and testing infrastructure for pool creation, swaps, and liquidity management.

List of Project KPIs and How the Project Addressed Them

1. **Smart Contract Architecture:**
   Implemented a single reference script for all pool logic, enabling swaps, liquidity actions, and staking key integration for ADA rewards.
2. **Functional MVP Interface:**
   Deployed a live frontend on testnet that supports wallet connection, pool creation, token swaps, and liquidity management.
3. **Transaction Chaining:**
   Demonstrated concurrent transaction support via transaction chaining — a critical requirement for future scalability of on-chain DEX trading.

4. **Protocol Analytics:**
   Provided real-time tracking of TVL, volume, active users, and pool counts via backend APIs and frontend visualizations.
5. **Testing & Documentation:**
   Included detailed test cases (manual `.feature` files), backend logs, and architecture documentation across all components.

Key Achievements

- Launched a live MVP of a batcherless DEX on Cardano testnet
- Developed smart contracts with staking logic and AMM pool support
- Enabled transaction chaining to support high concurrency
- Delivered real-time analytics with TVL, volume, DAU, and more
- Maintained full transparency through public GitHub repos and documentation
- Produced video materials demonstrating key interactions and infrastructure

---

Key Learnings

1. **Batcherless Architecture Is Viable:**
   Direct interaction with pool UTxOs can remove intermediaries, reduce latency, and improve decentralization.
2. **Chaining Enables High Throughput:**
   Transaction chaining proved effective in allowing multiple swaps within the same block — critical for user experience during peak load.
3. **Schema-Driven Analytics Help Users Understand the Protocol:**
   Surfacing live metrics such as TVL and DAU supports transparency and usability, especially when paired with accessible frontend design.
4. **Shared Codebases Improve Adoption:**
   Publishing contracts and tools in modular form accelerates developer onboarding and reuse in the Cardano ecosystem.

Comparison with Other DEXes

Unlike batcher-based DEXes on Cardano, Rapid DEX enables instant, low-fee trades by removing the batcher as an intermediary. Key comparative advantages include:

- **Execution Speed**: Swaps are finalized within a single block using transaction chaining.

- **No Slippage**: Users interact directly with pool UTxOs, with deterministic outcome (What You See Is What You Get), eliminating slippage caused by applying multiple orders in a batch
- **Lower Fees**: No external batcher means reduced transaction fees for users.
- **Transparency**: All pool logic is open-source, with real-time metrics displayed in the frontend UI.

Next Steps for the Product or Service Developed

If further funding is secured, WingRiders' plan is to engage the community to determine which of the following should be prioritized:

- Conduct audit, address all potential issues found
- Extend the feature set, bringing it in line with modern DEX capabilities
- Extend analytics and wallet support
- Continue benchmarking transaction chaining under high load

Final Thoughts / Comments

Rapid DEX showcases a high-performance, fully open-source alternative to batcher-based trading on Cardano. Its real-time architecture, protocol metrics, and smart contract simplicity demonstrate that decentralized trading can be seamless, affordable, and transparent — without sacrificing decentralization or user control. We thank the Catalyst community for making this project possible and look forward to community-driven extensions and adoption.

Links to Other Relevant Project Sources or Documents

- Application: https://rapid-dex.staging.wingriders.com
- GitHub Repository: https://github.com/WingRiders/rapid-dex
- Smart Contracts: https://github.com/WingRiders/rapid-dex-contracts
- Architecture Docs: https://github.com/WingRiders/rapid-dex/tree/main/docs
- Manual Tests: https://github.com/WingRiders/rapid-dex/tree/main/manual-tests
- Analytics Docs: https://github.com/WingRiders/rapid-dex/blob/main/docs/analytics.md
- Backend Logs: https://github.com/WingRiders/rapid-dex/blob/main/catalyst-evidence/milestone-3-backend-logs.log

Link to Close-out Video

https://youtu.be/C_fO5Ws9wn8