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 24, 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

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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, eliminating slippage from batcher reordering.
- **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

- Prepare for mainnet deployment following extended testnet usage
- Open community discussions for liquidity bootstrapping and governance
- Extend analytics and wallet support
- Formalize documentation and write tutorials for third-party integration
- 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/6AfBTNxSOF0?si=ozcA5JDtJbbdkt_g