SDG BLOCKCHAIN ACCELERATOR

MENTORSHIP FEEDBACK FORM

Team: Unicorn.eth
Project Title: *Crowdfunded Microgrids*
Country Office: UNDP Nordic Representation Office
Mentor: ELV Solutions Architect
Reporting Period: September–October 2025
Mentorship Focus: Wallet Integration, Multi-Asset Donations and Transaction Reliability

1. Executive Summary

Unicorn.eth successfully developed a crowdfunding platform for microgrid projects, enabling ADA and token-based donations directly through connected wallets.
The platform integrates with Cardano's pre-production and mainnet environments, supporting transparent, traceable, and low-friction donations to decentralized renewable energy initiatives.

Mentorship centered on improving UTxO management, optimizing transaction construction, and ensuring a reliable user experience during multi-wallet and multi-token donation flows.

2. System Architecture Overview

The Unicorn.eth solution builds upon the team's existing Giveth crowdfunding framework and integrates Cardano-native capabilities for donation transparency.
The system architecture includes:

- **Wallet & Transaction Layer:**
  Built using @meshsdk/react and @meshsdk/core, enabling wallet connections, transaction construction, and submission.
  Supports both ADA-only and token + ADA combinations, including retry logic for congested networks.
- **Application Layer:**
  Next.js 14 frontend with responsive design and integrated donation forms.

Displays USD conversion, minimum ADA checks, and provides real-time user feedback during transactions.

- **Data Layer:**
  Optional GraphQL API records donation metadata and transaction history for transparency and off-chain analytics.

This structure ensures cross-network flexibility, UX consistency, and secure transaction handling across both test and production environments.

3. Regulatory and Context Alignment

The project was developed in consultation with Nordic energy and crowdfunding compliance frameworks under UNDP supervision.
Key regulatory highlights include:

- No identified blockers for transparent, voluntary donation flows.
- Anonymous donations permitted, provided transaction visibility is maintained on-chain.
- No mandatory KYC/AML obligations at this stage, but voluntary audit trails and optional contributor verification are considered for future implementation.

This makes Unicorn.eth's model both regulatory-safe and scalable for wider European use cases in community-funded renewable energy systems.

4. Mentorship Focus and Guidance

A. Wallet Integration and Transaction Design

The mentorship sessions focused on:

- Improving multi-wallet support and ensuring network consistency between preprod and mainnet.
- Enhancing UTxO handling logic to prevent double-spending and overlapping transaction inputs.

- Implementing pre-checks for minimum ADA requirements and automatic balance normalization utilities.

B. Error Handling and User Experience

Guidance was provided on:

- Improving frontend error messages for insufficient balances and network mismatches.
- Adding ADA top-up prompts for token transfers that fall below min-ADA thresholds.
- Integrating normalizeAmount() and toUnits() utilities to reduce rounding and BigInt conversion errors during mixed-asset transactions.

C. System Reliability and Testing

The Solutions Architect supported the team in:

- Implementing retry mechanisms for congested networks to ensure donation submission reliability.
- Setting up transaction verification checks across environments to confirm donation success before receipt generation.
- Designing a plan for automated testing coverage across token donation workflows.

5. Technical Challenges

Category	Description
Multi-Wallet Handling	Pre-signed UTxOs caused occasional input duplication and state mismatches.
Numeric Conversions	BigInt and decimal conversion issues led to incorrect balance calculations in mixed token flows.

Network Switching	Users encountered transaction errors due to mismatched preprod/mainnet settings.
UX Friction	Users unfamiliar with min-ADA requirements struggled with incomplete transactions.

6. Key Learnings

- Balance normalization and ADA pre-checks drastically improved transaction success rates.
- Integrating retry logic for failed transactions enhanced reliability under variable network conditions.
- Consistent frontend feedback and error handling minimized user confusion and improved adoption.
- Modular SDK design allowed the team to quickly adapt their existing Giveth system for Cardano integration.

7. Recommendations and Roadmap

1. Transaction Fee Optimization:
   Fine-tune fee estimation algorithms to further minimize failed or underfunded transactions.
2. Donation UX Improvements:
   Simplify onboarding for new donors and enhance first-time wallet setup flows.
3. Wallet Compatibility Expansion:
   Add support for additional Cardano wallets (Flint, Lace) and ensure multi-asset compatibility.
4. Automated Testing Framework:
   Implement end-to-end (E2E) and unit testing to validate complex donation scenarios.
5. Token Donation Analytics:
   Expand GraphQL integration to record impact data and enable microgrid

funding transparency dashboards.

8. Mentor’s Reflections

Unicorn.eth has implemented a clean, reliable transaction system that reflects best practices for ADA and token-based crowdfunding. Their adoption of the Mesh SDK and focus on UX demonstrates strong maturity in blockchain integration. With refinements in fee logic, testing, and analytics, this platform is well-positioned for real-world energy impact funding.”

9. Post-Accelerator Collaboration

Following the accelerator, Unicorn.eth and Mentor plan to:

- Refine multi-wallet integration for improved donor accessibility.
- Conduct mainnet load testing under simulated donation traffic.
- Collaborate on analytics dashboards for UNDP reporting and impact visualization.
- Explore smart contract extensions for milestone-based microgrid disbursements.