

HydraAI Inspect

AI-Powered Vehicle Inspection & Fast Tokenization Layer on Cardano

"Bringing industrial-scale AI inspections to Cardano through Hydra"

Category: Cardano Use Cases: Prototype & Launch

Team: Sumbu Labs | **Duration:** 6 months | **Budget:** ₦75,000

The Problem



The global used car market surpasses \$1 trillion annually. Despite this massive scale, digital inspection records remain fragmented and unverifiable. The vehicle inspection industry faces critical trust and scalability challenges that undermine the reliability of condition verification across global markets.

- **Manipulation risk:** Vehicle inspection records are easily altered or falsified, creating significant fraud exposure
- **No global standard:** Digital condition verification lacks universal protocols, leading to fragmentation
- **Layer 1 constraints:** High inspection volumes make direct L1 blockchain recording prohibitively expensive
- **Trust deficit:** Buyers and sellers have no reliable way to verify inspection data authenticity

These challenges create friction in vehicle markets, increase transaction costs, and expose all parties to unnecessary risk.



Our Insight

Vehicle inspection processes are inherently **high-throughput environments**, generating a rapid sequence of events that demand immediate processing and verification.



Image Upload

Multiple angles captured

AI Analysis

Damage detection runs

Metadata Updates

Condition records generated

Verification

Multi-party approvals

Each comprehensive vehicle inspection can trigger dozens of state changes in mere seconds.

200

Inspections/Day

For a typical dealership

3,000+

State Updates Daily

Generated by these inspections

5 ADA

Cost Per Inspection

If recorded directly to L1

Recording these events directly to Cardano's Layer 1 would lead to prohibitive costs and unacceptable latency. This scale issue highlights a perfect use case for **Hydra's high-speed, low-cost Layer 2 processing**, enabling efficient batching of rapid events before final settlement to L1.

The HydraAI Inspect Solution

HydraAI transforms inspection into a verifiable, tamper-proof digital certificate.



Upload Vehicle Images

Capture photos via mobile interface.



AI Detects Damage

YOLO model identifies defects.



Hydra Batches Updates

Fast Layer 2 processing with instant finality.



Mint CIP-68 Token

Generate verifiable condition token.



Settle to Cardano L1

Immutable record on mainnet.

Why Hydra?

Hydra is the optimal Layer 2 solution for vehicle inspection workflows, offering technical capabilities that directly address performance and cost requirements.



High-Throughput Batching

Process thousands of inspection events per second without congestion.



Near-Instant Finality

Sub-second confirmation times enable real-time user experiences.



Ultra-Low Fees

Transaction costs measured in fractions of a cent.

Multi-Party Verification

Hydra Heads support collaborative workflows for inspectors, dealers, and third-party verifiers with shared state visibility.

Selective Settlement

Only final, verified inspection results commit to L1, reducing on-chain footprint while maintaining full auditability.

Performance Comparison: Hydra vs. Layer 1

Metric	Hydra (Layer 2)	Cardano L1 (Layer 1)
Cost	Fractions of a cent	Cents to dollars
Latency	Sub-second	Minutes to hours
Transaction Density	Thousands per second	Hundreds per second

These capabilities make Hydra uniquely suited for inspection workflows demanding speed and cryptographic verification.

What the MVP Demonstrates

Our minimum viable product will showcase a complete, functional vehicle inspection pipeline that proves the viability of Hydra for real-world industrial applications.

- This MVP will run fully on Cardano testnet and fully satisfies the Catalyst "Use Case: Prototype & Launch" category requirements.



AI Damage Detection

Computer vision identifies and classifies scratches, dents, paint damage, and structural issues.



Hydra Inspection Sessions

Multi-party Hydra Heads enable collaborative inspections with real-time state sync and cryptographic verification.



Updatable Metadata

Token metadata can be amended as new inspections occur, maintaining cryptographic proof of history.



QR-Enabled UI

Mobile interface allows users to scan QR codes for instant vehicle inspection history and certificates.



Public Testnet

Fully deployed on Cardano testnet for community testing and developer experimentation.

System Architecture Overview

Our technical architecture integrates best-in-class components across AI, blockchain, and cloud infrastructure layers to deliver a production-ready inspection platform.



Success Metrics

We will measure project success through quantifiable on-chain activity and community engagement metrics that demonstrate real-world adoption and technical viability.

On-Chain Performance Targets

500+

Inspection Events

Total vehicle inspections processed through the platform

300+

Tokens Minted

CIP-68 Vehicle Condition Tokens created on Cardano testnet

1000+

Hydra Transactions

Layer 2 operations demonstrating high-throughput capabilities

50+

L1 Settlements

Final state commitments to Cardano mainnet proving selective settlement efficiency

Community & Developer Engagement



Community Testers

Active users validating the inspection workflow



Developer Workshops

Technical sessions demonstrating Hydra integration patterns

These metrics will provide concrete evidence of both technical performance and practical utility, positioning HydraAI Inspect as a reference implementation for industrial Hydra applications.

6-Month Roadmap

Our development timeline is structured to deliver incremental value while maintaining technical rigor, with each milestone building toward a fully functional MVP.



Month 1: Architecture & AI

System design finalization, AI model training on vehicle damage datasets, infrastructure provisioning, and core API scaffolding



Month 2: Hydra Head Prototype

Hydra node deployment, state channel implementation, transaction batching logic, and Layer 2 performance testing



Month 3: CIP-68 Token Pipeline

Smart contract development for token minting, metadata schema design, IPFS integration, and L1 settlement workflow



Month 4: Full MVP Integration (MVP Complete!)

End-to-end workflow integration, frontend development, QR code generation, and internal testing with simulated inspections



Month 5: Public Testnet Deployment

Production infrastructure setup, testnet deployment, security audits, documentation creation, and initial community onboarding. A public testnet accessible URL will be provided.



Month 6: Community Testing & Iteration

Public beta program, developer workshops, bug fixes, performance optimization, and preparation of final deliverables

Each milestone includes defined deliverables, acceptance criteria, and community checkpoints to ensure transparency and accountability throughout the development process.

Sumbu Labs Engineering Team

Our team brings deep expertise across blockchain engineering, artificial intelligence, and scalable systems architecture—precisely the skill set required to deliver this ambitious project.



Giga Hidjrika Aura Adkhy
Project Manager & DevOps Engineer

Infra automation, Hydra deployment, project execution.



Maulana Anjari Anggorokasih
Blockchain & Backend Engineer

Cardano, Hydra integration, distributed backend systems.



Dzikran Azka Sajidan
Backend Engineer

API engineering, high-throughput workflows.



Azfar Azdi Arfakhsyad
AI/ML Engineer

Computer vision, YOLO detection, inference optimization.



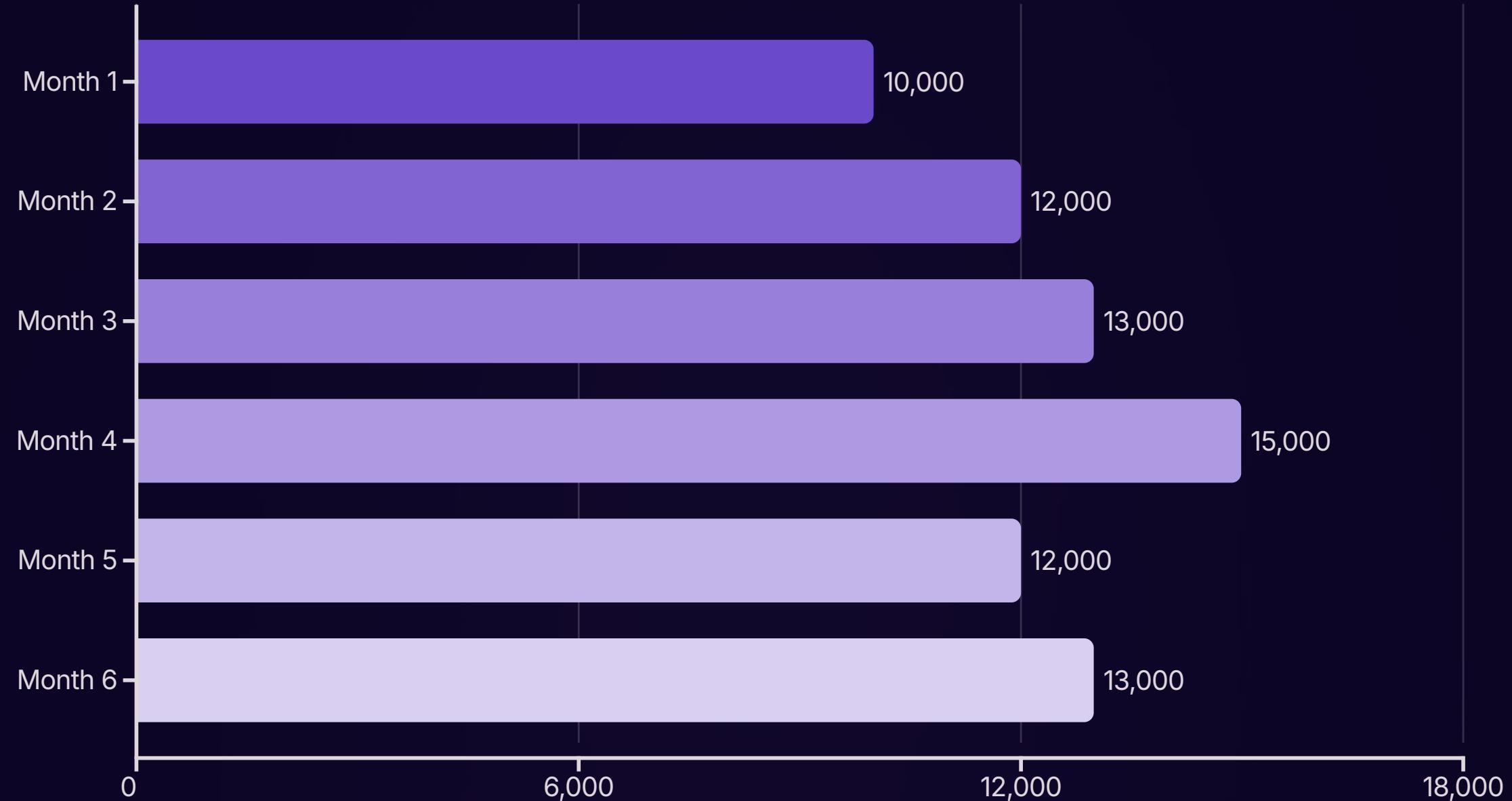
Farhan Franaka
Frontend Engineer

Mobile-first UI, QR inspection viewer.

This five-person team has previously collaborated on blockchain projects (CAR-dano on Project Catalyst Fund 13) and maintains a track record of delivering complex technical systems on schedule.

Budget Allocation: ₩75,000 ADA

Our budget is strategically allocated across the six-month development timeline to ensure consistent progress while maintaining team capacity throughout the project lifecycle.



Development Costs

Engineering salaries, AI infrastructure, and cloud computing resources comprise approximately 75% of the budget, ensuring our technical team has the tools and capacity needed for success.

- Open-source codebase → long-term ecosystem value

Infrastructure

Testnet operations, GPU compute for AI inference, IPFS/Backblaze storage, and Hydra node hosting account for 15% of allocated funds.

- Hydra reference implementation → reusable by other builders

Community & Documentation

The remaining 10% supports developer workshops, technical documentation, video tutorials, and community engagement activities.

- Low overhead (no marketing, no inflated salaries)

Month 4 represents peak development intensity as we integrate all components into the complete MVP. This funding profile ensures we can maintain full team engagement throughout the critical integration phase.

Why Vote for HydraAI Inspect?

HydraAI Inspect is a strategic investment in Cardano's Layer 2 ecosystem, delivering real-world utility and valuable technical infrastructure.

- Real industrial Hydra use case
- Fully open source
- AI + L2 scalability breakthrough
- Realistic 6-month roadmap
- High on-chain activity

Let's bring real-world scalability to Cardano with Hydra.

HydraAI becomes a flagship reference implementation for Hydra in real-world industries.

This project demonstrates Cardano's capability for high-throughput industrial applications. Your vote accelerates practical, scalable blockchain adoption.