

AO1: The Intelligence Hub for Solana

Whitepaper

Solana Breakout Hackathon

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Abstract

AO1 is a modular, extensible, and AI-native intelligence infrastructure built to structure, index, and extract meaningful signal from the vast and fast-moving landscape of the Solana blockchain. As Solana’s pace of innovation accelerates—particularly around the proliferation of permissionless token launches, automated market makers, and community-driven assets—the need for real-time intelligence tools becomes critical. AO1 aims to fill that gap by positioning itself as the **Google of Solana**: a highly composable, user-driven search, discovery, and insight engine that supports every participant in the Solana ecosystem, from casual traders to professional quants, from community builders to protocol developers.

Unlike traditional analytics dashboards that rely on static views and predefined filters, AO1 is powered by a network of dynamic, query-responsive **agents**—autonomous software components capable of parsing, ranking, and responding to structured prompts in real time. These agents ingest data from a high-frequency scraping and indexing layer that pulls from live on-chain events (e.g., token deployments, wallet flows, liquidity deltas, volume surges) and enriches them with off-chain sentiment, community metrics, and engagement data. The first deployed agent, **Penelope**, enables users to interact with Solana’s token ecosystem via natural language queries such as, “Show me new tokens with rising volume and more than 500 holders,” returning precise, ranked results in milliseconds. In future iterations, additional agents will track social narratives, wallet clustering, governance events, and DAO flows—giving users unprecedented visibility into the behavioral and structural dynamics of the Solana network.

AO1’s infrastructure is designed with scale and modularity at its core. The backend includes an append-only time-series index, sharded data storage, and scalable agent runtimes that allow hundreds of parallel agent evaluations to occur concurrently without sacrificing latency. The platform also includes a fully functional app layer, where users can register accounts, generate unique referral links, create custom watchlists, and receive real-time alerts. Every interaction within the ecosystem is captured and quantified using **AO1 Points**, a non-tokenized reputation and incentive layer that tracks user contribution, referrals, agent interactions, and session engagement. These points are redeemable during reward cycles for future access, airdrops, and revenue-sharing events, creating a tangible incentive structure for early adopters.

Beyond being an end-user intelligence platform, AO1 is also a platform for **builders**. Through the AO1 Agent Framework, developers can build and upload their own agents, define their interfaces and outputs, and earn usage-based rewards based on how often and how effectively their agents are used. Over time, this will evolve into a permissionless agent economy, where highly specialized modules—ranging from NFT discovery bots to macro liquidity monitors—can be built, deployed, and monetized. Each agent will be

evaluated based on performance metrics, uptime, precision, and engagement, allowing for a meritocratic incentive model that aligns value creation with value distribution.

Importantly, AO1 is **not** designed to replace existing dashboards, block explorers, or APIs—it is designed to **complement** and enhance them by functioning as a real-time reasoning layer that can adapt to user-defined strategies. While dashboards require users to interpret data manually, AO1 returns distilled intelligence, enabling both beginners and professionals to cut through the noise and make timely, data-informed decisions.

The long-term vision for AO1 extends beyond token discovery. As the Solana ecosystem becomes increasingly multi-agent and modular, AO1 will expand to include agents for governance analysis, real-time MEV detection, token unlock monitoring, influencer mapping, cross-chain arbitrage tracking, and more. It will support agent staking, on-chain publishing of agent modules, and the emergence of DAO-curated intelligence networks. By combining flexible infrastructure, a powerful agent engine, and a self-reinforcing reward loop, AO1 is building the foundation for a decentralized AI-native information system that can scale with the network it's built for.

This paper outlines the core design of AO1, including its indexing system, signal architecture, agent runtime, scaling model, reward layer, and long-term roadmap. It is intended to serve as both a technical blueprint and an invitation to builders, traders, and researchers who want to contribute to and benefit from Solana's first intelligence-native platform.

1. Introduction

In traditional ecosystems, search, indexing, and information delivery are managed by centralized platforms. In crypto, and especially in fast-paced chains like Solana, these primitives are either missing, fragmented, or non-performant. AO1 exists to fill this critical infrastructure gap.

The platform offers:

- A custom-built scraping and real-time indexing engine tailored to Solana token creation, wallet activity, and liquidity flows
- A suite of agents capable of parsing this data and surfacing insights based on user prompts or autonomous triggers
- A framework for third-party developers to build, deploy, and monetize their own agents
- A native point-based incentive system (AO1 Points) that rewards referral, usage, and contribution

Users can now:

- Register, verify, and create usernames
- Interact with Agent Penelope, the first of many AO1 agents
- Generate unique referral links that tie directly into a point-based reward model

2. Data & Indexing Infrastructure

2.1 Scraping Infrastructure

Let $\lambda(t)$ be the token launch rate at time t . Total token launches between t_0 and t_1 is given by:

$$T_{\text{launch}}[t_0, t_1] = \int_{t_0}^{t_1} \lambda(t) dt$$

The scraping process normalizes:

- Token metadata
- Creator wallet identity
- Liquidity depth over time
- Initial trades and swaps

This data is funneled into an append-only time series database optimized for agent querying.

2.2 Normalization Pipeline

Each token τ is represented as a feature vector:

$$x(\tau) = [L_0, L_1, V, H, D_w, S]$$

Where:

- L_0 : Initial liquidity
- L_1 : Current liquidity
- V : Volume over a sliding window
- H : Holder count
- D_w : Wallet diversity index
- S : Social signal delta

3. Agent Design and Runtime

3.1 Core Agent Runtime

The base interface is defined as: $f(Q, D) \rightarrow R$

Where:

- Q : User or system prompt
- D : Dynamic dataset of live tokens
- R : Ranked, filtered response set

3.2 Base Agent: Penelope

Scoring function: $\sigma(\tau) = \alpha_1 * dL/dt + \alpha_2 * \log(H)$

Tokens are returned if they meet threshold: $\sigma(\tau) \geq \mu_\sigma + z * \sigma_\sigma$

3.3 Agent Expansion

In future, AO1 will support:

- Agents focused on wallet behavior and clustering
- Agents for narrative emergence based on social indexing
- Agents for DEX behavior tracking
- Multimodal agents combining on-chain and off-chain data

4. AO1 Agent Framework for Builders

Let $A = \{a_1, a_2, \dots, a_n\}$ be the set of all deployed agents. Let U_i be the usage count of agent a_i .

Reward function: $R(a_i) = P_{total} * (U_i / \sum U_j)$

An advanced model includes agent reputation: $R(a_i) = P_{total} * (U_i * \rho_i / \sum (U_j * \rho_j))$

Where ρ_i is a reputation score derived from:

- Accuracy of predictions

- Engagement per response
- Uptime and responsiveness

5. User Experience & App Layer

5.1 Account Creation & Verification

Users can:

- Register accounts via email
- Choose a unique username
- Track referral performance

5.2 Referral Links

Each user receives a referral link: $\mathcal{L}_i = \text{ao1.io/?ref=user}_i$

A signup event S_j triggered from \mathcal{L}_i credits user i with δ points.

Total AO1 Points for user i :

$$P_i = \sum \delta(S_j) + \beta_1 E_i + \beta_2 I_i$$

Where:

- E_i : Total engagement time
- I_i : Agent interactions logged

6. AO1 Points Economy

AO1 Points are:

- Earned via referrals and usage
- Off-chain, trackable, and persistent
- Tied to future airdrops, gated features, and real-time rewards

At reward cycle t , total reward pool A_t :

$$R_i^t = A_t * (P_i / \sum P_j)$$

7. Scaling and System Performance

7.1 Concurrency Model

Let κ be max concurrent agent threads. Let R_{cpu} be available compute per instance.

$$\kappa = \lfloor R_{\text{cpu}} / C_{\text{agent}} \rfloor$$

Where C_{agent} is the average CPU load per evaluation.

7.2 Token Throughput

Assuming $\lambda = 800$ tokens/hour:

$$T_{\text{daily}} = \lambda \times 24 = 19,200 \text{ tokens/day}$$

Real-time pipeline handles:

- Parsing: $O(n)$
- Enrichment: $O(n \log n)$
- Agent query: $O(n)$

8. Long-Term Vision

AO1 is not a single agent or application. It is a network.

Future Features:

- Agent staking
- AI agent tournaments and ranking
- Integration with major Solana DEXes and explorers
- DAO-curated agent registries

9. References

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twitter: @ao1functions

website: ao1.io