

# **The State of Decentralized Publishing: Lessons for Building a Cardano-Native Knowledge Ecosystem**

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## **Abstract**

Academic publishing is at a crossroads. Centralized control, costly access barriers, and limited transparency have created a fragile system for the dissemination of scientific knowledge. This paper reviews over forty decentralized publishing platforms built across Ethereum, Polygon, Arweave, Stellar, and Cardano, identifying trends that signal a shift toward open, token-incentivized, and reputation-anchored models of scholarship. Through this synthesis, we distill lessons for designing a Cardano-native knowledge ecosystem that combines blockchain verifiability with the rigor of academic review.

## **Introduction**

The production and certification of knowledge have long been mediated by a small number of academic publishers. Despite the promise of digital access, most journals continue to operate within paywalled, centralized infrastructures. The result is a system that often prioritizes profit over dissemination and maintains asymmetrical power between authors, reviewers, and institutions.

Web3 technologies challenge this dynamic. Over the past five years, blockchain-based publishing initiatives have multiplied, seeking to realign ownership, credit, and access. Platforms such as Orvium, ResearchHub, and Octopus reimagine scholarly communication as an open network rather than a linear pipeline. Others—Mirror, Paragraph, and Lens Protocol—extend these principles to creative and technical writing, introducing programmable publishing models that treat text, review, and commentary as composable, on-chain assets.

Funded under Project Catalyst Fund 13, the Agnostica project aims to understand and build upon these developments. Whereas the first phase of the project synthesized theoretical advances in peer review, the second phase—summarized here—focused on mapping the emerging landscape of blockchain-enabled publishing. The goal was not merely to catalogue platforms, but to derive actionable insights that can inform the design of a Cardano-native publishing protocol aligned with the network's core values of transparency, decentralization, and verifiable identity.

## **Methods**

This review examined forty-three decentralized publishing platforms and supporting infrastructures active as of early 2025. Projects were identified through whitepapers, community documentation, GitHub repositories, and published analyses. Inclusion criteria required that a project: 1) Operate on or integrate with a blockchain or distributed ledger technology; 2) Include a mechanism for publishing, reviewing, storing, or curating digital content; and 3) Demonstrate an explicit link to scholarly or knowledge-oriented communication.

Each project was coded along five analytic dimensions: (1) Incentive Structures (token rewards, staking, reputation); (2) Governance and Curation (DAO frameworks, editorial voting, open review); (3) Identity and Attribution (use of wallets, decentralized identifiers, or verifiable credentials); (4) Infrastructure (storage, consensus layer, interoperability); and (5) Adoption and Sustainability (user activity, institutional partnerships). Coding and thematic synthesis followed an inductive approach similar to the PRISMA-inspired framework used in the Fund 13 literature review, allowing emergent patterns to complement predefined categories.

## Results

Platforms like Orvium, PubWeave, ResearchHub, and Octopus represent the most direct attempts to replicate or replace academic journal functions. Orvium (on Polygon) employs DAO-based governance where reviewers and editors stake tokens to participate in publication decisions. Reputation scores are tied to review quality, and transactions are public on-chain. ResearchHub (Ethereum/Arbitrum) introduces a Reddit-style forum where contributions earn ResearchCoin (RSC) based on community voting. Octopus, supported by eLife, emphasizes modular publishing—papers are broken into hypotheses, methods, and results, each reviewed and rewarded separately. PubWeave, a Cardano-affiliated project, integrates peer review into NFTs, linking reviews to immutable metadata stored on-chain. Collectively, these systems prioritize transparency, but few have achieved robust academic uptake. The absence of standardized identity verification and cross-chain credential recognition remains a key barrier to institutional acceptance.

A second cluster—Mirror, Paragraph, Lens Protocol, and Farcaster Frames—illustrates the rise of composable, creator-centric publishing. Mirror transforms essays into NFTs with programmable royalties, supporting co-authorship and remixing. Paragraph and Lens Protocol embed social discovery, allowing citations and follows to function as social proofs. These frameworks privilege content ownership and network reach over peer validation, offering valuable lessons for academic systems that wish to increase visibility and engagement while retaining quality control.

Projects such as Book.io, Zora, and MintGate explore the intersection of publishing, intellectual property, and tokenized ownership. Book.io leverages Cardano's native tokens to represent digital books as collectible assets, embedding royalties directly in the token contract. Zora provides an open protocol for minting and selling creative works, emphasizing secondary-market transparency. While these systems were not built for academia, they demonstrate how transparent ownership and programmable royalties can empower authors. The challenge is translating these affordances to scholarly contexts, where citation and credibility replace resale value as the core metrics of success.

Finally, decentralized storage infrastructures—Arweave, IPFS, and Filecoin—provide the backbone for permanence. Arweave's "permaweb" ensures long-term data availability by economically incentivizing storage providers. IPFS supports distributed hosting and

content addressing, often used for publishing metadata. Filecoin extends these principles with market-based storage contracts. Academic publishing requires precisely this guarantee of integrity: once a record is published and verified, it must remain accessible in perpetuity. Integrating these storage systems with identity frameworks such as Atala PRISM and ORCID would ensure both permanence and provenance.

## Discussion and Conclusion

The review reveals a fragmented but rapidly maturing ecosystem. Most blockchain publishing initiatives cluster into one of three archetypes: 1) Incentive-driven platforms, emphasizing token rewards and community voting; 2) Governance-driven platforms, focused on decentralized editorial oversight; and 3) Infrastructure-driven systems, ensuring data permanence and interoperability. While none alone provides a comprehensive model of decentralized scholarship, together they offer a composite blueprint.

Three overarching lessons emerge: Decentralization alone does not guarantee legitimacy; the credibility of academic work depends on transparent but rigorous validation. Systems like Orvium and PubWeave demonstrate that successful adoption requires hybrid models—distributed participation anchored by verifiable identity and traceable reputation. Second, identity and reputation are foundational. Without reliable verification, decentralized publishing risks anonymity and spam. Integrating Atala PRISM for decentralized identifiers, ADA Handle for user recognition, and stake-weighted reputation scoring can provide the backbone of a verifiable scholarly identity system within Cardano. Finally, sustainability depends on alignment between economic and epistemic incentives. Token economies can encourage participation but may also foster speculation. Cardano's architecture—where staking represents both economic and reputational investment—offers a model for sustainable incentive alignment.

Building on these lessons, Agnostica's roadmap envisions a Cardano-native publishing protocol with the following design principles: verifiable authorship through PRISM and ORCID; immutable but updatable records anchored on-chain; tokenized incentives weighted by reputation; DAO-based editorial governance; and open APIs for interoperability with existing repositories. In sum, decentralized publishing is no longer a speculative frontier—it is an evolving infrastructure that redefines how knowledge is certified and shared. Cardano stands uniquely positioned to host this evolution, combining transparent governance, verifiable identity, and sustainable tokenomics.

The next phase of Agnostica's work will operationalize these insights through a prototype decentralized publishing dApp, translating theory into infrastructure. In doing so, it will test whether the values of science—openness, collaboration, and accountability—can truly be coded into the values of Cardano.