N.K. ORCHID COLLEGE OF ENGINEERING AND TECHNOLOGY SOLAPUR BY

COMPUTER SCIENCE AND ENGINEERING STUDENTS ASSOCIATION(CSESA)

Idea Presentation Round

Project Title : Web3-Based Decentralized Science (DeSci) Publishing

Project Theme : Education

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Problem Statement

Overview of Idea

✅ Free & Open Access – Research is stored permanently on IPFS/Filecoin.

✅ Tamper-Proof Reviews – Smart contracts record peer reviews transparently.

✅ AI-Powered Verification – AI detects plagiarism and checks research authenticity.

✅ Incentives & Ownership – Researchers and reviewers earn rewards via blockchain tokens.

Problem Statement

Traditional research publishing is expensive, centralized, and lacks transparency, making it difficult for researchers to share knowledge openly and fairly.

- High Costs & Restricted Access
- Opaque & Biased Peer Review
- No Author Ownership Proof
- Lack of Reviewer Incentives

Proposed Solution

Existing Solution

- **Traditional Publishers** (Elsevier, Springer, IEEE, etc.)

➖ Limitation: Paywalls & high publishing fees restrict access.

- **Open Access Platforms** (ResearchGate, etc.)

➖ Limitation: No transparent peer review & no researcher incentives.

- **Web3 Research Platforms** (e.g., DeSci Labs)

➖ Limitation: Early-stage adoption, lacks AI-powered insights.

Proposed Solution

1. Open Science Movement

- Research should be freely accessible → Led us to a decentralized model.

2. Web3 & Blockchain Transparency

- Smart contracts ensure fair peer review → Used blockchain for verification.

3. AI-Powered Review (OpenAI API)

- Automates research validation
- Checks for plagiarism, accuracy & readability
- Runs asynchronously with Celery & Redis

Technical Design

Methodology And Process For Implementation

✅ **Decentralized Storage:** IPFS / Filecoin – Stores research papers securely and ensures permanent access.

✅ **Blockchain Infrastructure:** Pinata – Smart contracts for transparent peer reviews, authorship verification, and token incentives.

✅ **Backend & AI Processing:** Django (Python) + Web3.py – Manages authentication, AI-powered plagiarism checks, and metadata storage.

✅ **Frontend UI:** Next.js (React.js, Tailwind CSS) – Intuitive platform for researchers to upload, review, and publish.

✅ **Database Management:** PostgreSQL / Firebase – Hybrid model for metadata storage.

✅ **AI Integration:** OpenAI API – Plagiarism detection, summarization, impact analysis.

✅ **Authentication:** Web3 Login (MetaMask, WalletConnect) – Secure, decentralized user authentication.

Engineering Design

AI-Powered Review (OpenAI API)

- Automates research validation
- Checks for plagiarism, accuracy & readability
- Runs asynchronously with Celery & Redis

Blockchain & Decentralized Storage

- Research metadata stored on Polygon
- Papers stored securely on IPFS
- Ensures immutability & censorship resistance.

Hybrid Data Management

- PostgreSQL for user profiles & metadata
- IPFS for decentralized document storage
- Seamless API handling via Django & GraphQL

Impact and Conclusion

Impact of the solution

✅ Free & Open Access – Eliminates paywalls, making research accessible to everyone.

✅ Transparency & Trust – Blockchain-based peer review ensures fairness and prevents bias.

✅ Author Ownership – Researchers retain full control over their work with blockchain verification.

✅ Incentivized Peer Review – Tokenized rewards encourage high-quality and timely reviews.

✅ AI-Enhanced Research – Automated plagiarism detection and impact analysis improve research quality.

✅ Decentralized & Censorship-Resistant – IPFS/Filecoin ensures permanent, tamper-proof storage.

🚀 Empowering global researchers with a fair, transparent, and decentralized publishing ecosystem!

Specific areas of application

1. Academic Research & Publishing 📚
2. Peer Review & Scientific Validation 🔬
3. Open Access for Students & Institutions 🎓
4. Blockchain & Web3 Research ⛓️
5. AI-Powered Research Analysis 🤖
6. Scientific Collaborations & Global Research Communities 🌍

Conclusion

- ✅ Traditional research publishing is **expensive, opaque, and exclusive**.
- ✅ Our platform introduces a **decentralized, AI-powered, and blockchain-based** alternative.
- ✅ Ensures **tamper-proof publishing, transparent peer review, and open access** to all.
- ✅ Incentivizes reviewers, verifies authorship, and boosts research quality with AI.
- ✅ Empowers **students, researchers, and institutions** globally with **fair and fast** publishing.

We’re not just building a platform — we’re shaping the future of research publishing.