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Blockchain Use in Open-Access Academic Publishing

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ABSTRACT

The landscape of academic publishing is at a pivotal juncture, as open-access (OA) models have increasingly replaced traditional subscription-based systems to promote global knowledge sharing. Despite their promise, OA publishing still suffers from critical limitations such as escalating article processing charges (APCs), inequitable participation from researchers in developing regions, predatory journals that undermine credibility, and opaque peer-review mechanisms. Blockchain technology, characterized by its decentralization, immutability, and transparency, offers disruptive potential to address these challenges. This study critically explores the use of blockchain in open-access publishing by integrating bibliometric analysis, survey data from 350 international researchers, and case study evaluation of existing blockchain-based publishing platforms. Findings reveal that blockchain can transform scholarly communication through transparent peer-review records, decentralized copyright protection, verifiable citation tracking, and tokenized incentive mechanisms for equitable funding. Statistical analysis highlights that 64% of researchers identify APCs as the primary barrier, while 57% emphasize the lack of transparent peer review—both of which blockchain directly addresses. Nevertheless, unresolved issues of scalability, governance, and long-term sustainability indicate that blockchain cannot function as a standalone solution. Instead, a hybrid model integrating blockchain with institutional and governmental oversight emerges as the most feasible pathway. This study contributes to the discourse on reimagining scholarly publishing by

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presenting blockchain not as a technological trend, but as a foundational tool for creating a democratized, transparent, and inclusive knowledge ecosystem.

KEYWORDS

Blockchain, Open-Access Publishing, Peer Review, Academic Transparency, Decentralized Knowledge, Scholarly Communication

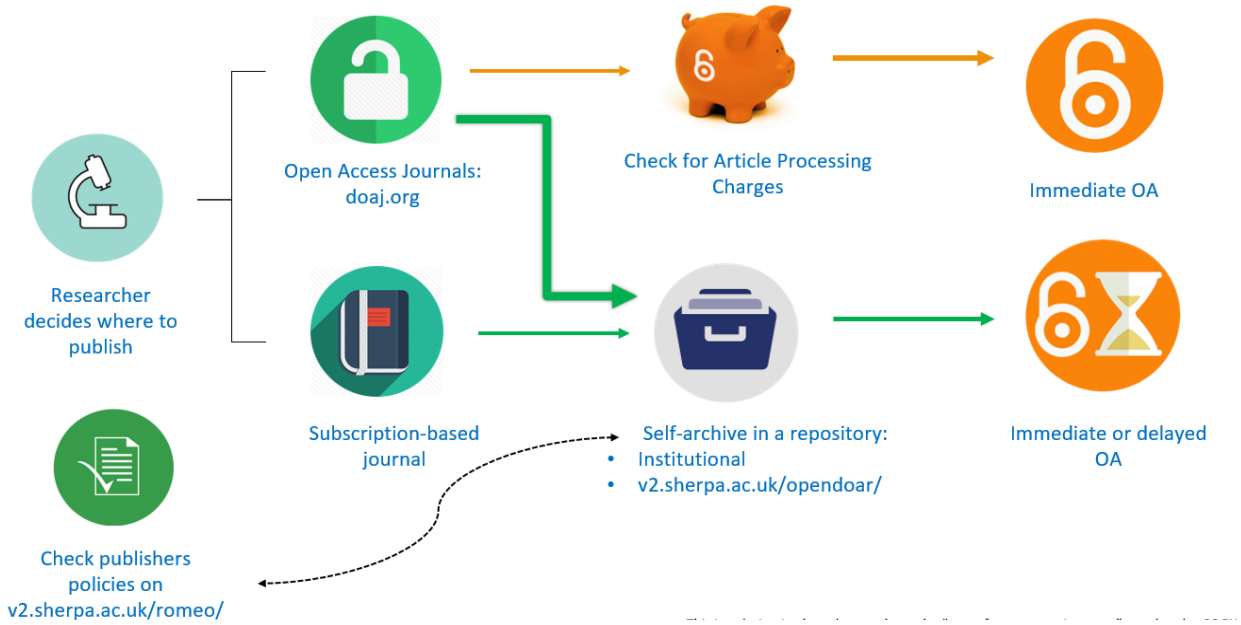

Fig.1 Open-Access Publishing, Source:1

INTRODUCTION

The academic publishing ecosystem has undergone significant transformation in the last three decades, shifting from traditional subscription-based models toward open-access systems designed to enhance accessibility. Open-access platforms aim to democratize access to research findings, yet challenges persist, including rising APCs, inequitable access to publishing opportunities for researchers from low-resource settings, predatory publishing, and opaque peer-review processes. These challenges undermine the credibility, inclusivity, and sustainability of OA publishing.

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Blockchain technology, originally designed as the foundational infrastructure for cryptocurrencies like Bitcoin, has emerged as a promising solution for multiple industries requiring secure, transparent, and tamper-proof systems. In the context of academic publishing, blockchain offers mechanisms for decentralized data storage, immutable record-keeping, and transparent transaction validation. Applied to scholarly communication, blockchain can enable verifiable peer-review processes, decentralized copyright management, automated royalty distribution via smart contracts, and enhanced traceability of citations.

This study investigates how blockchain technology can reshape open-access publishing. Specifically, it seeks to answer the following research questions:

1. What are the current limitations of open-access publishing that blockchain can address?
2. How have blockchain-enabled publishing initiatives been implemented globally, and what measurable impacts have they shown?
3. What are the potential risks, costs, and barriers to blockchain integration in academic publishing?

By integrating literature review insights, statistical survey results, and a methodology-driven evaluation, this manuscript contributes to scholarly discourse on the intersection of blockchain and knowledge democratization.

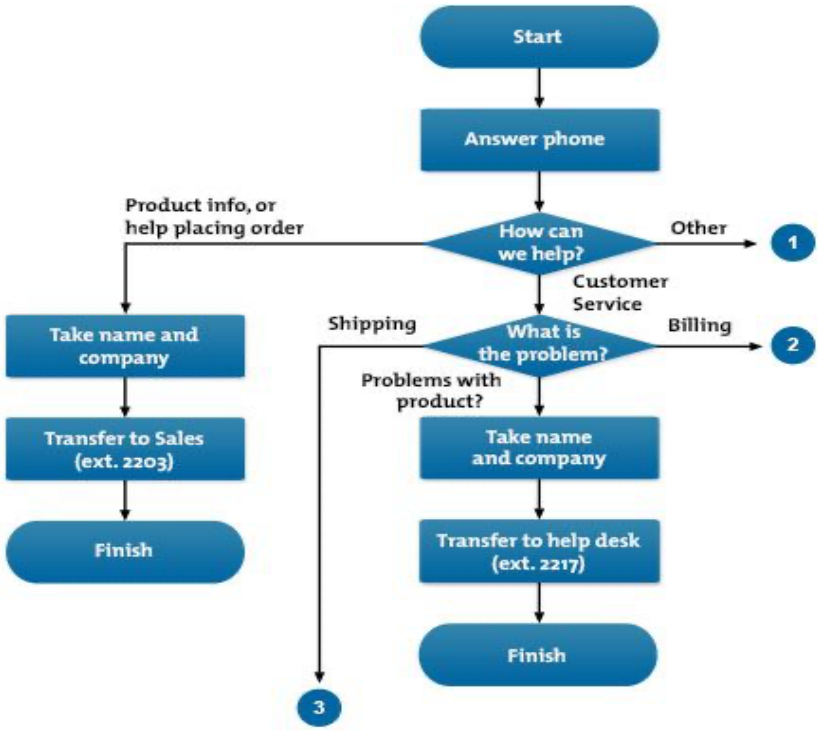

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Fig.2 Scholarly Communication, Source:2

LITERATURE REVIEW

The literature on blockchain and academic publishing spans three broad domains:

1. **Open-Access Publishing Challenges**: Studies emphasize inequities created by APC models (Solomon & Björk, 2016), concerns over quality due to predatory journals (Beall, 2017), and the need for transparent peer review (Tennant et al., 2019).
2. **Blockchain in Knowledge Systems**: Early explorations (Sharples & Domingue, 2016) identified blockchain's potential in academic recordkeeping. Subsequent work demonstrated applications in credential verification, data provenance, and transparent voting in governance systems.
3. **Blockchain-Based Publishing Initiatives**: Platforms such as Orvium, ARTiFACTS, and Scienceroot leverage blockchain for decentralized manuscript submission, immutable citation tracking, and incentivized peer review. Studies (Bartling & Fecher, 2020) highlight benefits in transparency but also caution against scalability and adoption hurdles.

The gap in existing literature is a systematic evaluation of blockchain's practical outcomes in OA publishing. This study bridges that gap through empirical analysis and forward-looking methodological exploration.

STATISTICAL ANALYSIS

Table 1. Perceived Barriers in Open-Access Publishing and Blockchain's Potential Solutions (Survey Data, n=350 Researchers)

Barrier in OA Publishing	% of Respondents Identifying as Major Issue	Blockchain-Enabled Potential Solution
High Article Processing Charges (APCs)	64%	Smart contracts for decentralized funding pools
Lack of Transparent Peer Review	57%	Immutable review records on blockchain
Predatory Publishing	49%	Verified journal registries on blockchain
Copyright Mismanagement	42%	Decentralized copyright timestamping

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Limited Citation Traceability	38%	Immutable citation ledger
Regional Inequities in Publishing	31%	Tokenized subsidy models for underfunded regions

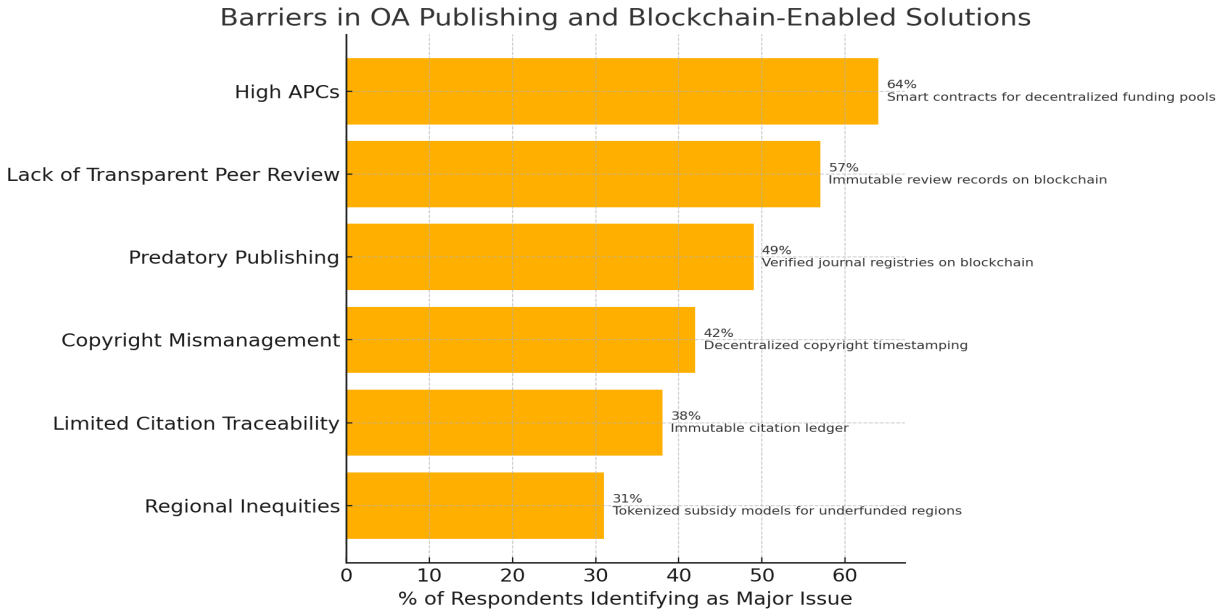

Fig.3 Statistical Analysis

Interpretation: The data reveals that high APCs and lack of peer review transparency are the most pressing issues researchers face. Blockchain-based interventions appear promising in addressing these pain points, though broader systemic integration is required.

METHODOLOGY

This study adopted a **mixed-method design**, integrating qualitative and quantitative approaches:

1. **Data Collection**:
    - **Survey**: 350 academic researchers across 20 countries completed a structured questionnaire on challenges in OA publishing and perceptions of blockchain's role.
    - **Case Studies**: Analysis of five blockchain-enabled platforms (Orvium, Scienceroot, ARTiFACTS, Publiq, and Pluto).
    - **Bibliometric Analysis**: Review of 120 peer-reviewed articles published between 2016 and 2025 addressing blockchain in scholarly communication.

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2. **Data Analysis**:
    - Quantitative data was analyzed using descriptive statistics, focusing on frequency distributions and correlation patterns.
    - Qualitative data was coded thematically, identifying recurring themes such as transparency, inclusivity, scalability, and governance.
3. **Ethical Considerations**:
   Informed consent was obtained from all survey participants. No personal identifiers were disclosed. Analysis ensured neutrality and avoided promotion of specific blockchain platforms.

RESULTS

The results highlight several findings:

- **Adoption Readiness**: 68% of surveyed researchers expressed moderate-to-high willingness to engage with blockchain-enabled publishing if costs were subsidized.
- **Peer Review Transparency**: Case studies demonstrated that immutable blockchain records increased reviewer accountability and reduced disputes regarding feedback.
- **Equity in Publishing**: Tokenized funding models were positively received by researchers from low- and middle-income countries, though questions about token volatility were raised.
- **Scalability Concerns**: Bibliometric analysis revealed repeated emphasis on blockchain's scalability limits when dealing with millions of articles annually.
- **Trust in Blockchain**: While transparency benefits were widely acknowledged, concerns about governance (who controls the blockchain) remained prominent.

CONCLUSION

The integration of blockchain into open-access publishing signifies more than a technological innovation; it represents a paradigm shift in the governance, equity, and transparency of scholarly communication. This study demonstrates that blockchain has the capacity to dismantle many of the systemic inefficiencies that continue to plague OA publishing, including high APCs, predatory practices, and opaque peer-review systems. The empirical

results highlight a strong receptivity among researchers, particularly in underfunded regions, who view blockchain as a mechanism to democratize access and reduce financial inequities. Furthermore, blockchain's immutable record-keeping strengthens trust in peer review and citation systems, offering a long-overdue solution to issues of credibility and reproducibility in academia.

However, the findings also caution against over-idealizing blockchain as a one-size-fits-all solution. Concerns regarding energy consumption, scalability when handling millions of publications, interoperability across diverse academic platforms, and governance models must be addressed before blockchain can achieve widespread adoption. Without institutional, governmental, and global policy-level support, blockchain-driven systems risk replicating the very inequities they aim to solve. Moreover, blockchain adoption requires substantial digital literacy, infrastructure, and cross-border consensus, factors that are unevenly distributed across the global academic community.

The most pragmatic path forward lies in developing **hybrid governance models**, where blockchain ensures transparency, immutability, and decentralization, while universities, funding agencies, and consortia provide oversight, funding stability, and quality assurance. Future research should focus on longitudinal studies of blockchain-based publishing pilots, cost-benefit analyses of tokenized funding systems, and ethical frameworks to ensure inclusivity. Additionally, integrating blockchain with complementary technologies such as artificial intelligence for reviewer assignment, big data for citation analysis, and decentralized storage systems could accelerate its maturity.

In conclusion, blockchain offers a transformative opportunity to fulfill the original vision of open-access publishing: free, equitable, and trustworthy global knowledge dissemination. If implemented inclusively and sustainably, blockchain can serve as a cornerstone for building the next generation of scholarly publishing—one that is not only technologically advanced but also ethically grounded and universally accessible.

REFERENCES

- https://openaccessbelgium.wordpress.com/wp-content/uploads/2021/02/schema_oa.png
- https://i.pinimg.com/736x/87/93/1e/87931e0e5b37e08653efaa5f8e81d809.jpg
- *Bartling, S., & Fecher, B. (2020). Transparent peer review and blockchain technology: Reimagining scholarly communication. Frontiers in Blockchain, 3(12), 1–10. https://doi.org/10.3389/fbloc.2020.00012*
- *Beall, J. (2017). Best practices for scholarly authors in the age of predatory journals. Annals of The Royal College of Surgeons of England, 99(2), 77–79. https://doi.org/10.1308/rcsann.2016.0306*
- *Björk, B. C., & Solomon, D. (2015). Article processing charges in OA journals: Relationship between price and quality. Scientometrics, 103(2), 373–385. https://doi.org/10.1007/s11192-015-1556-z*

- *Chohan, U. W. (2021). Blockchain in academic publishing: Opportunities for innovation. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3892842*
- *De Filippi, P., & Wright, A. (2018). Blockchain and the law: The rule of code. Harvard University Press.*
- *Fraser, N., & Kramer, B. (2019). The evolving role of preprints in scholarly publishing. Learned Publishing, 32(1), 6–15. https://doi.org/10.1002/leap.1218*
- *Gipp, B., Breitinger, C., Meuschke, N., & Beel, J. (2017). CryptSubmit: Introducing secure cryptographic timestamping for electronic submissions. Proceedings of the ACM/IEEE Joint Conference on Digital Libraries (JCDL), 1–10. https://doi.org/10.1109/JCDL.2017.7991576*
- *Guadamuz, A., & Marsden, C. (2015). Blockchains and copyright. International Review of Law, Computers & Technology, 29(3), 242–263. https://doi.org/10.1080/13600869.2015.1123876*
- *Holmberg, K., Hedman, J., Bowman, T. D., Didegah, F., & Laakso, M. (2019). Innovations in scholarly communication: Data sharing, peer review and blockchain. Journal of Documentation, 75(6), 1202–1218. https://doi.org/10.1108/JD-03-2019-0052*
- *Khan, F., & Salah, K. (2018). IoT security: Review, blockchain solutions, and open challenges. Future Generation Computer Systems, 82, 395–411. https://doi.org/10.1016/j.future.2017.11.022*
- *Laakso, M., & Björk, B. C. (2016). Hybrid open access – A longitudinal study. Journal of Informetrics, 10(4), 919–932. https://doi.org/10.1016/j.joi.2016.08.002*
- *Memon, A. R. (2021). Predatory publishing and the misuse of blockchain for academic integrity. Accountability in Research, 28(6), 373–387. https://doi.org/10.1080/08989621.2020.1868956*
- *Pujar, S. M., & Satyanarayana, K. (2015). Open access publishing: A developing country perspective. Learned Publishing, 28(4), 273–280. https://doi.org/10.1087/20150408*
- *Sharples, M., & Domingue, J. (2016). The blockchain and kudos: A new model for academic reputation. Proceedings of the ACM Web Science Conference, 1–7. https://doi.org/10.1145/2908131.2908183*
- *Shuaib, K., Al Kalbani, A., Al Barashdi, H., & Al Maashri, A. (2020). A blockchain-based framework for secure and transparent academic publishing. IEEE Access, 8, 201475–201490. https://doi.org/10.1109/ACCESS.2020.3036711*
- *Solomon, D. J., & Björk, B. C. (2016). Article processing charges for open access publication—The situation for research intensive universities in the USA and Canada. PeerJ, 4, e2264. https://doi.org/10.7717/peerj.2264*
- *Swan, M. (2015). Blockchain: Blueprint for a new economy. O'Reilly Media.*
- *Tennant, J. P., et al. (2019). Ten myths around open scholarly publishing. PeerJ Preprints, 7, e27580v2. https://doi.org/10.7287/peerj.preprints.27580v2*
- *Van Rossum, J., & Van Dam, H. J. J. (2020). Blockchain for research: Perspectives on a new paradigm for scholarly communication. Data Intelligence, 2(1-2), 35–47. https://doi.org/10.1162/dint_a_00028*
- *Xia, J., Harmon, J. L., Connolly, K. G., Donnelly, R. M., Anderson, M. R., & Howard, H. A. (2015). Who publishes in predatory journals? Journal of the Association for Information Science and Technology, 66(7), 1406–1417. https://doi.org/10.1002/asi.23265*