Quality & peer review: the future

Emily Marchant, Author Services Manager, Cambridge University Press

The problems

1. Difficulty identifying suitable (and available) reviewers
2. Lack of reviewer recognition
3. Fraud, bias and manipulation
4. Lack of transparency & trust in the process
5. New standards for what's important in research: e.g. reproducibility & negative results

Developments needed

Blockchain for Peer Review

1. Continue developing the standards for review as normal, via mentorship, reviewer training and expanding reviewer pools

2. Establish an infrastructure whereby information about peer review should be shared within the ecosystem, fully complying to demands around confidentiality and privacy.

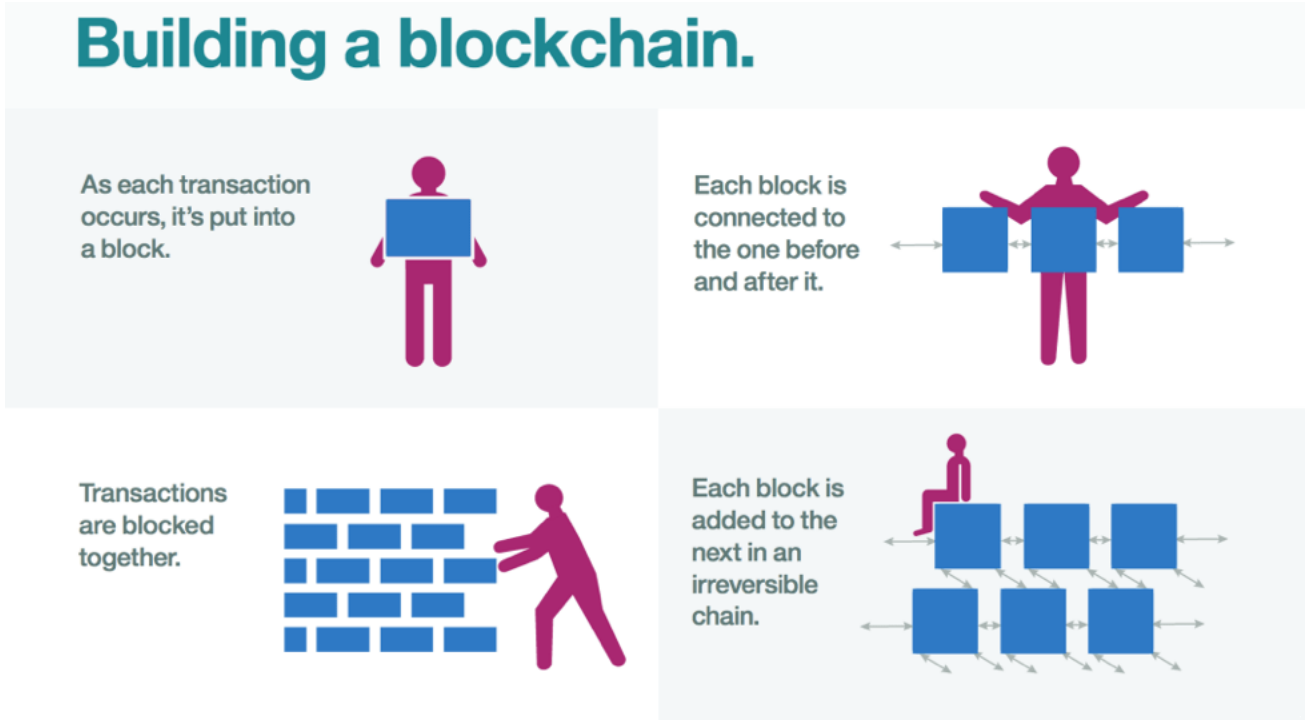
What is blockchain?

Blockchain for Peer Review

A *public*[1], *permanent*[2], *append-only*[3], *distributed*[4], *ledger*[5]

1. Some blockchains require permission to access, others are accessible to anyone
2. If properly set up, a blockchain is very hard to tamper with encoded data
3. Old transactions can't be changed, only new ones can be added
4. No single entity owns or controls a public blockchain
5. A shared ledger to record transactions

Applications:
Cryptocurrencies, smart contracts, IP & asset management, digital identity management, decentralized data store



Sources: *MIT Technology Review*, "What is a Blockchain?"
IBM, https://www.ibm.com/cloud/garage/architectures/blockchainArchitecture/

The solution

Blockchain for Peer Review

Publisher collaboration to solve challenges of peer review using the possibilities provided by blockchain technology.

Access to de-anonymized info and improvement of review practices remains in the hands of publishers, but we also harness blockchain to increase trust and transparency in the system.

Blockchain for Peer Review: mission

Blockchain for Peer Review

By allowing parties in the ecosystem to share information around peer review activities, we can make the review process more efficient, transparent, and recognizable.

By storing and sharing review information on the blockchain, we can do this safely, without the need of a central gatekeeper, and fully complying to demands around review confidentiality and privacy.

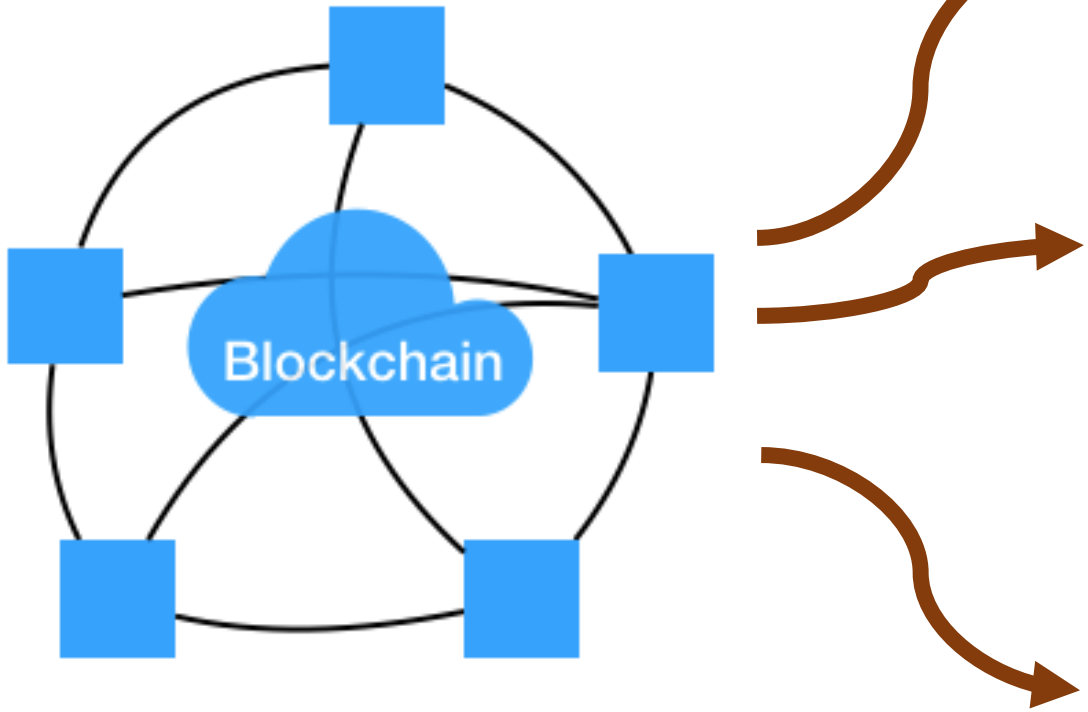
Blockchain for Peer Review

Blockchain can achieve trust

- **Decentralized**: no single (commercial) owner or governance
- **Distributed:** everyone can host a copy of the data store
- **Transparent but pseudonymous**: Encryption can obfuscate identities and information where needed

Our initiative is focusing on improving three aspects of the review process:

Blockchain for Peer Review



Recognition: information sent to e.g. ORCID, Institutions

Finding: we can build better or support reviewer finding solutions by ensuring complete review profiles, including reviewer's preferences and availability

Validation: review process can be independently verified & demonstrated e.g. by badges on journal pages

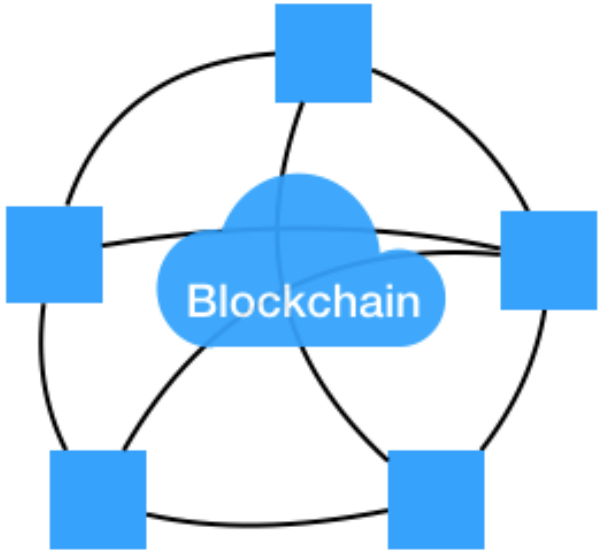
Founding partners

The review blockchain architecture

Applications for phase 1 and 2

Phase 1

- Review process stored and partially query-able on blockchain (three publishers, 45 titles)
- Validated information sent to ORCID review profiles

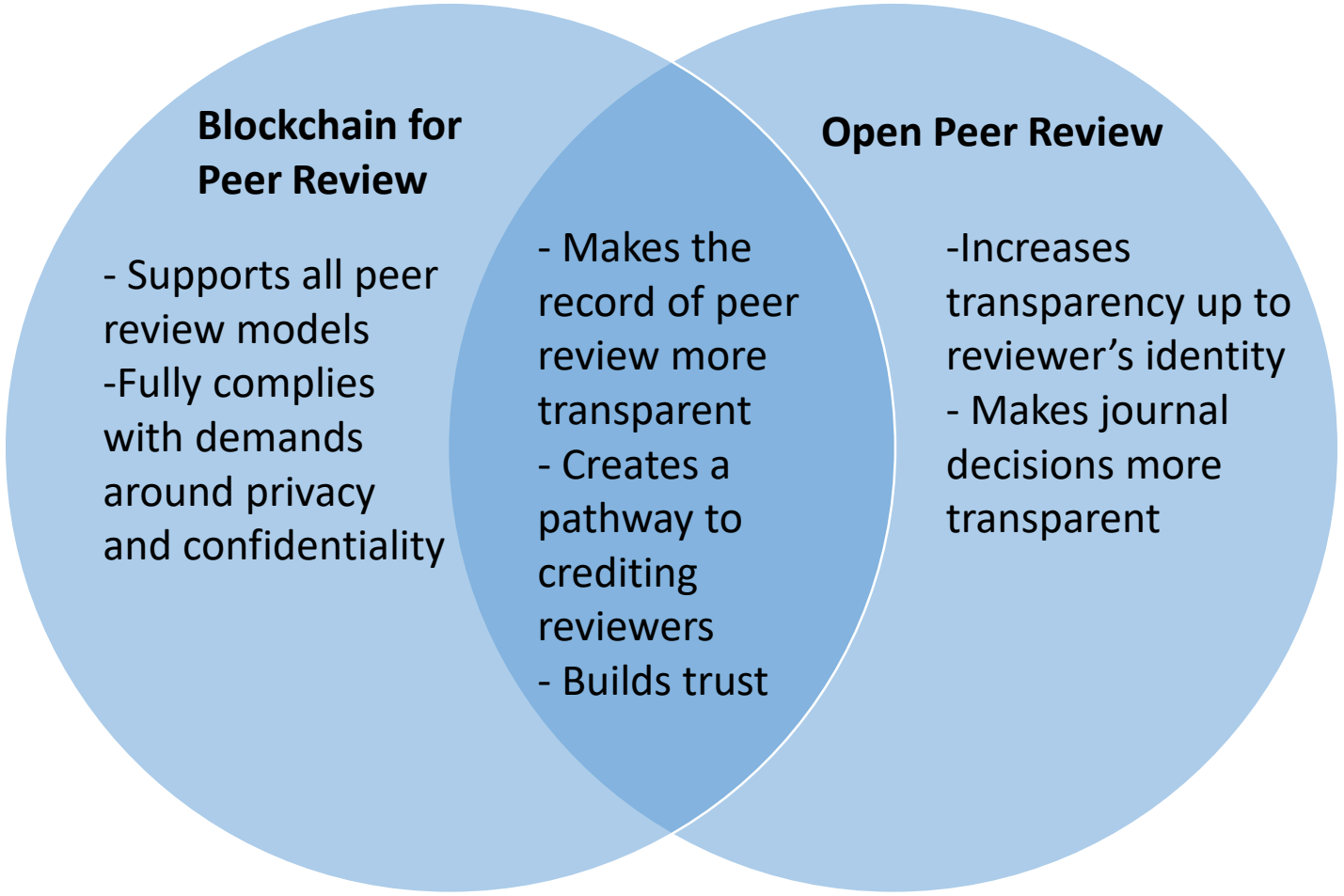


ORCID

Phase 2

- Expansion of titles/publishers
- Reviewers can indicate their interest and availability to do reviews via their ORCID profiles

Alongside open peer review



Reference: *Nature* News & Comment, "Publish Peer Reviews" https://www.nature.com/articles/d41586-018-06032-w