Academic publishing, the blockchain, and shifting roles in a rapidly changing world
“Our technology produces a state of chronic revolution”
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Aldous Huxley, 1956
PHILOSOPHICAL TRANSACTIONS:
GIVING SOME ACCOUNT
OF THE PRESENT Undertakings, Studies, and Labours
OF THE INGENIOUS
IN MANY CONSIDERABLE PARTS
OF THE WORLD.

Vol I.
For Anno 1665, and 1666.

In the SAVOY,
Printed by T. N. for John Martyn at the Bell, a little without Temple-Bar, and James Allestry in Duck-Lane; Priests to the Royal Society.
Why are we here?

“To support researchers in what they can’t do, or don’t feel like doing themselves”
The role of publishers

- **Registration**: Establishing the author’s precedence and ownership of an idea
- **Certification**: Ensuring quality control by peer-review
- **Dissemination**: Communicating the findings to the relevant audience
- **Preservation**: Preserving a fixed version for a future reference and citation
Establishing the author’s precedence and ownership of an idea

Ensuring quality control by peer-review.

Communicating the findings to the relevant audience

Preserving a fixed version for a future reference and citation

Managing reputations!
The emergence of alternatives

- Registration
- Certification
- Dissemination
- Preservation
The emergence of alternatives
The emergence of alternatives
piracy

noun

the unauthorized use or reproduction of another's work.
"software piracy"
synonyms: illegal reproduction, plagiarism, illegal copying, copyright infringement, bootlegging, stealing, theft
"software companies are reluctant to say how much piracy costs them"
Or

A traditional role now performed better by others, i.e. researchers themselves through social networks?
Registration
Certification
Dissemination
Preservation
Challenges in Certification

1. Reproducibility
Challenges in Certification

2. Peer review crisis: transparency & recognition

The Crisis Of Peer Review

Geoffrey Kabat, CONTRIBUTOR

“ If peer review were a drug, it would never get on the market.”

Hundreds of thousands of papers are published each year in the medical literature, and the pressure to publish continues to grow. But one of the core requirements for publication (and since quality is impossible to determine in advance for the vast majority of papers published) is peer review.

Peer review is in crisis, but should be fixed, not abolished

November 15, 2016 2.54am GMT

More is less in the world of research publications. Desktop image via www.shutterstock.com.
Challenges in Certification

3. Limited & outdated metrics
Conclusion

- Our role outside certification is becoming smaller
- Certification is increasingly relevant, but facing challenges
Blockchain & scholarly communication
What Blockchain IS NOT

**Bitcoin's scalability problem**

Bitcoin's blocks are limited to 1MB in size and the transaction volume on the Bitcoin network can be large as the current

**Bitcoin Mining Now Consuming More Electricity Than 159 Countries Including Ireland & Most Countries In Africa**

**Bitcoin Consumes 30 Times More Electricity than Tesla Cars**
What is blockchain (1)?

The technology behind cryptocurrencies:

“A digital currency in which encryption techniques are used”
1. A cryptocurrency for science

Creating an economy of science & research

Decentralized Scholarly Communication Platform

PLUTO makes scholarly communication reasonable and transparent.
What is blockchain (2)?

From *Internet of information* to an *Internet of value*

Blockchain:

- Establishes ownership
- Prevents double spending
2. Digital Rights Management

• Blockchain is an ideal technology for **DRM** ('smart publishing')

• **Micropayments** open way for a new business model
What is blockchain (3)?

Blockchain is a (very special kind of) data storage:

• Decentralized
• Shared & immutable
• Transparent, but pseudonymous
3. Single science repository

Author X submits Data Y to repository A
Author X submits ms Y to journal Y
Editor X sends MS Y for review to reviewers X, Y
Reviewer X,Y submit review reports A,B
Editor X makes decision Y
Article X based on MS Y was published on date X
Article X was downloaded on date X
Article X was cited by journal Y on data Y
Advanced research metrics

Access allows for validation, transparency, reproducibility

Research Blockchain

Author X submits Data Y to repository A
Author X submits ms Y to journal Y
Editor X sends MS Y for review to reviewers X, Y
Reviewer X,Y submit review reports A,B
Editor X makes decision Y
Article X based on MS Y was published on date X
Article X was downloaded on date X
Article X was cited by journal Y on data Y
Conclusion

- Our role outside certification is smaller
- Certification is relevant but challenged
- Blockchain can bring significant improvements
Innovation ... or disruption?
How to get started?

"This really is an innovative approach, but I'm afraid we can't consider it. It's never been done before."
PEER REVIEW
Peer review challenges

1. Difficulty finding suitable reviewers
2. Lack of reviewer recognition
3. Fraud and manipulation
4. Lack of transparency & trust in the process
The Peer Review Blockchain

Develop complete, authoritative and decentralized data store of review(er) data using the blockchain technology:
The Peer Review Blockchain

Develop complete, authoritative and decentralized data store of review(er) data using the blockchain technology:

• Making process more robust and transparent
The Peer Review Blockchain

Develop complete, authoritative and decentralized data store of review(er) data using the blockchain technology:

• Making process more robust and transparent
• Feeding applications to find, validate, and recognize reviewers
The Peer Review Blockchain

Develop complete, authoritative and decentralized data store of review(er) data using the blockchain technology:

- Making process more robust and transparent
- Feeding applications to find, validate, and recognize reviewers
- Complying to requirements around confidentiality and privacy
Why blockchain?

- Decentralized
- Shared, immutable
- Transparent, but pseudonymous
Advantages of Review Blockchain

Reviewers:
- Improved recognition
- More targeted invitations to review
Advantages of Review Blockchain

**Reviewers:**
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- More targeted invitations to review

**Editors:**
- Reviewer finding tools
- Complete profiles so optimal selection and validation
- Higher acceptance rates through better recognition
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**Editors:**
- Reviewer finding tools
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**Publishers:**
- Removal of various obstacles in review process
- Better demonstration and justification of publisher’s role
- More transparency, increased trust
Pilot phase

**Data store** of review information for a selection of journals

- Information is fed to ORCID
- Process can be tracked and audited

Release: **Summer 2018**
Join us!

DIGITAL science

ORCID Connecting Research and Researchers

Katalysis

SPRINGER NATURE
Thank you!

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