



SCIENCE
EUROPE
Shaping the future of research

DIGITAL TRANSFORMATION IN SCHOLARLY COMMUNICATION

BRUSSELS

20 AND 21 NOVEMBER 2019

EVENT
REPORT

April
2020

Colophon

April 2020

Event Report 'Digital Transformation in Scholarly Communication'

Author: Science Europe
For further information please contact the
Science Europe Office: office@scienceeurope.org

© Copyright Science Europe 2020. This work is licensed under a Creative Commons Attribution 4.0 International Licence, which permits unrestricted use, distribution, and reproduction in any medium, provided the original authors and source are credited, with the exception of logos and any other content marked with a separate copyright notice. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/> or send a letter to Creative Commons, 444 Castro Street, Suite 900, Mountain View, California, 94041, USA.





DIGITAL TRANSFORMATION IN SCHOLARLY COMMUNICATION

BRUSSELS, 20 AND 21 NOVEMBER 2019

Table of Contents

Introduction	5
Workshop Overview	5
Welcome and introduction	5
Keynote speech	6
Session 1: Reinventing the publication process	6
Session 2: Innovative infrastructures to support research processes and communication	6
Session 3: How blockchain could help redesign scholarly communication	7
Key Points from the Discussion	8
A. Community building and ownership	8
B. Sharing and keeping the knowledge	9
C. Sustainable funding of not-for-profit, open initiatives	9
D. Enhanced functionalities and interoperability	10
E. Quality of review services and quality assurance	10
F. Evolution of current roles and emergence of new actors	11
G. Change of culture vs. change of technologies	11
Summary and conclusions	12
Programme	15

Introduction

Ever since the establishment of the Philosophical Transactions of the Royal Society in 1665, scholars have relied on journals to disseminate their findings. It is a model that has served the scholarly community well for many years. With the advent of digital technologies, multiple aspects of this model have evolved, allowing new publication formats (such as preprints or datasets). However, in many cases, the paper journals have simply been converted to a digital format, still presenting a static snapshot of an evolving research process.

Advancements in digital technologies do not only provide tools to rethink the publication formats, but also to modernise the entire scholarly publication process and landscape. As such, they generate high expectations, but it is still unclear whether they will be able to deliver on their promises and what the ideal publication landscape

should look like to deliver the highest added value for the scientific community.

Science Europe's workshop on Digital Transformation in Scholarly Publication (programme in annex), which took place on 20 and 21 November 2019 in Brussels, offered participants the opportunity to brainstorm and discuss how the digital revolution and innovative models of information dissemination might challenge the current research publishing practices.

The workshop brought together 38 participants, including 21 representatives from Science Europe's Member Organisations. The workshop programme committee was composed of members of the Science Europe Working Group on Open Access. Seven key points to consider in the digital transformation of the scholarly communication were identified from the contributions of the workshop speakers and participants.

Workshop Overview

Welcome and introduction

Geraldine Clement-Stoneham (Medical Research Council, UK Research and Innovation) and **Maud Evrard** (Science Europe) opened the event. Maud Evrard welcomed the opportunity to explore innovative ways towards Open Access for research publications. "This workshop

was initially entitled 'Open Access 2030'", said Geraldine Clement-Stoneham. "It was built on a simple question: can we do things differently? What if...?" She encouraged all participants to be bold and imagine their ideal scholarly communication landscape.

Keynote speech

Aileen Fyfe (University of St Andrews, UK) took the participants through 350 years of scholarly publication history, as seen in the journals of the Royal Society (UK). She described the various changes in the processes, the technologies, and the culture underlying scholarly publication, especially in journals. She showed that the way journals worked (including their editorial processes and their prestige function) has never been set in stone. Journals have always operated within a wider system of scholarly communication, and so their function has shifted when other elements of the system changed. She also pointed out that journals have done more than just ‘communicate’ science: they have built communities and gen-

erated the tokens that build academic careers. The question is whether those roles should still be played by journals, now that so many new communications options are available. She emphasised that technological innovations do not bring change on their own: change depends on how people choose to use them. And with a scientific community that is far more diverse and international than it was when journals first developed, it might wish to use those technological options differently. Evolution of technologies in the publishing landscape must be coupled with evolutions in the wider social, economic, legal, and political context to fully deliver on their promises.

Session 1: Reinventing the publication process

“Which superpowers could stakeholders use to unblock progress to Open Access?” was the question asked by **Toby Green** (Coherent Digital) at the start of his presentation. According to him, many stakeholders of the scholarly communication ecosystem (policy makers, funders, universities, authors, librarians, and so on), despite claims to be in favour of Open Access, play the waiting game and hope for someone else to make the first move. As a result, they maintain the unsatisfactory status quo of the current system. Referring to the village of comic-book character Asterix, he

wondered what stakeholders could achieve if they had access to some magic potion to give them superpowers. To stir up the debate, he suggested that research funders create their own journals. He also called on university administrators to require (re)appointment, promotion, and tenure committees to evaluate applicants without taking into account where their research has been published. Publishers could also propose freemium options and librarians could stop building collections, in other words, buying content in bulk that is, to some extent, not read.



What could we do if we had access to some magic potion?



Session 2: Innovative infrastructures to support research processes and communication

The presentations in the second session provided an overview of two specific initiatives: Pubfair and PubSweet. The focus was on innovative infrastructures, new functionalities and enhanced collaborative approaches that can support a

transition away from printed journals’ workflows and processes.

Eloy Rodrigues (COAR and University of Minho, Portugal) presented the Pubfair vision,¹ devel-

1. https://comments.coar-repositories.org/wp-content/uploads/2019/09/Pubfair_-_A-Framework-for-Sustainable-Distributed-Open-Science-Publishing-Services.pdf

oped by the Confederation of Open Access Repositories (COAR),² in which repositories become “the birthplace of publications and data, and not their graveyards.” Pubfair is a modular open source publishing framework that aims at building upon a distributed network of research data repositories and enables access to a suite of functionalities, such as built-in open review and transparent publication processes. The development of the Pubfair concept is guided by three objectives: the replacement of the current outdated technologies used in repositories to support innovative services; a common set of behaviours and standards exhibited by all repositories; and the building of new services on top of the distributed repository content, such as peer review, social networking and discovery.

Eloy Rodrigues compared Pubfair with the digital revolution in the music industry: from a single dissemination format such as the vinyl record

or CD (comparable to the journal), to Spotify where the user can select tracks, receive recommendations, share playlists, and so on. He added that Pubfair is, however, not a centralised single platform or server, but a connection of individual interoperable ‘resources’ in a highly distributed environment.

The PubSweet software, developed by Coko (Collaborative Knowledge Foundation)³ and presented by **Adam Hyde**, is free and open source and allows any entity to build a tailor-made publishing platform. Coko gathers a community of users/builders to constantly improve the toolbox. The software is also co-developed and modular. Twelve platforms have already been built on it, including the manuscript submission system integrated with Europe PMC.⁴ The code is adapted to develop applications and workflows tailored to meet various organisations’ needs, with or without the support of the Coko team.

Session 3: How blockchain could help redesign scholarly communication

During the last session of the workshop, **Sandra Vengadasalam** (Max Planck Digital Library, Germany) shed some light on blockchain and how this new technology can contribute to the redesign of the information flow in scientific infrastructure. A blockchain is “an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.”⁵ To be used as a distributed ledger, “a blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new blocks. Once recorded, the data in any given block cannot be altered retroactively without alteration of all subsequent blocks, which requires consensus of the network majority.”⁶

Sandra Vengadasalam then presented Bloxberg,⁷ a blockchain initiative developed by a consortium that includes the Max Planck Digital Library. Bloxberg aims to provide scientists with blockchain-based, decentralised services and to strengthen the ties among the global scientific community. Blockchain allows timestamping and sharing of data and metadata. Bloxberg services can include the certification of content creation to avoid disputes over intellectual properties, the recording of datasets, and so on. One example of the use of Bloxberg was to certify a university’s diploma, recording a unique entry for the person to whom it was awarded.

2. <https://www.coar-repositories.org/>

3. <https://coko.foundation/>

4. <http://blog.europepmc.org/2019/05/welcome-new-EuropePMC-plus.html>

5. Iansiti, Marco; Lakhani, Karim R. (January 2017). “The Truth About Blockchain”. Harvard Business Review. Harvard University

6. Wikipedia definition of blockchain, retrieved on 30 March 2020: <https://en.wikipedia.org/wiki/Blockchain>

7. <https://bloxberg.org/>

Key Points from the Discussion

Each presentation was followed by rounds of discussions among all participants. From all presentations and discussions, a series of seven key themes was identified as essential

to evolve towards a successful digital transformation in scholarly communication. They are as follows.

A. Community building and ownership

Bringing together scholars has been a central and major focus of journals since the creation of the *Philosophical Transactions* in 1665. Aileen Fyfe highlighted that their founder, Henry Oldenburg, used this new channel as a prolongation of his correspondence with his incredible network of European scholars in order to share the most interesting pieces with them. Journals in the 19th century often played a complementary role to the meetings of scholarly societies and associations.

Unsurprisingly, collaboration among all stakeholders involved in the scientific community at large was depicted as essential to design the future of scientific publishing, identify barriers, and jointly find solutions, beyond individual interests or visions.

Taking the example of Plan S⁸ and the debates it generated, Toby Green highlighted the need for inclusive reflections. Scholars especially must feel included.

The development of communities and their role in the development of innovative infrastructures were central aspects highlighted in the examples presented by Eloy Rodrigues, Adam Hyde, and Sandra Vengadasalam.

In a blockchain, the transactions – or blocks of information – are no longer recorded in a centralised system with a stored ledger (a publisher, a government, a bank, and so on), but in a decentralised system with a distributed ledger. In Bloxberg, all 40 members of the consortium have copies of all recorded information. The community validates all blocks that are added to the blockchain (they all run one authority node) via the algorithm of the chain. New members can join

the consortium once they have been accepted by the existing members.⁹

The Pubfair design and development are based on user experience and needs, and the framework is built on existing, distributed repositories. Such a structure enables a distribution of control to decrease the risk of monopolisation by a limited number of stakeholders. It also fosters inclusiveness and diversity by integrating different institutions and regions with particular needs and contexts (such as diverse language, policies and priorities). With openly available technologies, architectures and protocols, Pubfair also contributes to make scholarly content a common good.

The PubSweet software blocks are modular, 100% open source, and 100% community-owned and -driven. The Coko community gathers a diversity of organisations: for example, the French financial jurisdictions use a platform built on PubSweet for the authoring of audit reports.¹⁰ All organisations that use the software collaborate, learn from each other, and contribute to the software development. They all commit to share their code to reduce the burden for the other members of the community.

Participants agreed that community-led solutions can offer a valuable choice for different publishing avenues other than the commercial systems controlled by a handful of publishers. This has led, amongst other consequences, to the continuous increase of subscription costs. Communities who want to develop new ways of sharing knowledge can exploit technological advances and build new dissemination mechanisms. Workshop participants exchanged views on these various approaches and the added value they can deliver to the scholarly communication landscape.

8. <https://www.coalition-s.org>

9. <https://www.mpg.de/13417668/first-international-blockchain-for-science-bloxberg>

10. <https://coko.foundation/french-financial-jurisdictions-and-coko-collaboration/>

However, concerns were raised regarding what some considered as the fragmentation of re-

sponsibility and accountability. In a decentralised system, who is accountable for flaws or mishaps?



Academic institutions such as universities are the most sustainable institutions after the Church.



B. Sharing and keeping the knowledge

Aileen Fyfe pointed out that, in the late 17th century, printed periodicals were seen as way of preserving ephemeral fragments of knowledge. By the late 18th century, however, they were playing a dual role: sharing knowledge, and acting as repositories of knowledge. Various participants highlighted that journals may no longer be the best medium to achieve either of these goals, however. According to Toby Green, most scholars at the University of California accepted the decision of its library to stop buying certain journals. They had access to the relevant content via other channels and considered journals as “being too slow anyway”. According to Eloy Rodrigues, “their main use is their reputation system and we should get rid of that, too.”

Moreover, journals do not necessarily allow for all valuable research contributions to be available and recognised. The workshop participants expressed a wish for easier access to a wider variety of format types of scholarly information,

such as working papers, preprints, datasets, computational notebooks, experimental protocols, and literature reviews. New digital infrastructures can offer relevant solutions to integrate those within the research/publishing continuum.

To ensure long-term access and preservation of this knowledge, the publication venues and back-end infrastructures must be reliable, stable, and sustainable. According to Eloy Rodrigues, academic institutions such as universities are “the most sustainable institutions after the Church.” Their repositories, on which Pubfair is based, can bear the responsibility of providing stability.

The amount of scholarly content that is being published has increased tremendously and is expected to continue doing so. Participants highlighted that all dissemination avenues must be indexed or connected to catalogues, information systems, or other discovery tools in order to be available to the scholarly community at large.

C. Sustainable funding of not-for-profit, open initiatives

Most initiatives presented during the workshop were not-for-profit initiatives, and predominantly open ones. Most participants agreed on the relevance of such models. However, the costs and maintenance requirements of not-for-profit initiatives were raised as a challenge to their sustainability. Any initiatives setting up or using such models need to produce an adequate business plan or funding plan.

Coko, COAR, and Bloxberg are funded by contributions from their respective communities. Coko also generates additional funds from consulting work on bespoke developments, when organisations do not have the skills to build their own applications based on the available PubSweet tools.

A key mission of research funders is to stimulate the creation of new knowledge and innovation, which should apply also to the scholarly publica-

tion infrastructure. Workshop participants also acknowledged that research institutions and libraries have an active role to play to guarantee long-term access to the disseminated content.

During the discussion, several national and institutional initiatives supported by research funders were mentioned. These included funding streams

for the establishment and maintenance of repositories, for national information systems, and for value-added services such as dashboards that enable researchers to follow up the number of downloads of their articles. However, most research funders cannot easily guarantee long-term funding (beyond five years), as they are themselves subject to government budget cycles.

D. Enhanced functionalities and interoperability

New digital technologies undoubtedly enable new functionalities to complement existing publishing services. New features allow research outputs, data, and metadata to be interoperable across repositories. They also enable new types of metrics, alerts, enhanced readability and searchability functions – including in metadata, virtual participation, annotation, and so on.

Technical developments and collaborative approaches as described in section A can maximise the usefulness of these possibilities. Adam Hyde encouraged all stakeholders to build or modify existing solutions in a way that allows plug-ins for further functionalities, including from external service providers. To this end, interoperability is key. Participants discussed different ways of ensuring interoperability: connecting various digital structures (at discipline level in priority, and then across disciplines), agreeing on common standards for new structures and services, creating forums where teams can meet to share experience and build together.

For example, the Bloxberg consortium encourages scientists and start-ups to develop and establish services and applications on the Bloxberg blockchain. To this end, an open application programming interface (API)¹¹ was built and can be used with no transaction fee. In the Bloxberg vision, the chain can be used for a large diversity of applications. This includes, amongst others, applications related to intellectual property and data protection (to issue on-demand certifications – also for PhD and Master theses, certify the lifecycle of the research process, enhance repro-

ducibility, and so on), research data sharing (such as encryption protocols, distributed computation), and transparency on research funding (sharing information on stakeholders, investments).

Participants drew a parallel with research data sharing infrastructures. In Flanders, Belgium, a movement emerged inspired by the building of the European Open Science Cloud (EOSC)¹² and stakeholders are joining forces to create a Flemish Open Science Board and federate existing digital tools.

According to Eloy Rodrigues, “repositories can be the Swiss knife of publication: multifunctional.” Sandra Vengadasalam wondered whether blockchain could be the next ‘Gutenberg moment’, alluding to a possible radical change in the way we produce and disseminate knowledge.

With a potential that is still uncertain, the new blockchain technology and the possibilities it could offer when applied to scholarly communication led to a very lively discussion among participants. Enthusiastic reactions, scepticism, curiosity, and concerns were expressed. One of the main focuses of blockchain is for now enabling tamper-proof certifications, recordings, and transactions. Some participants questioned how this new technology could contribute to greater open access to publications. Others considered that, as was the case with the development of the internet 20 years ago, blockchain technology may enable functionalities that cannot be anticipated at this time.

E. Quality of review services and quality assurance

During the discussions, the requirement for the published scholarly outputs to be quality as-

sured proved to be one of the most common concerns. This issue was raised as a response

11. <https://github.com/bloxberg-org/bloxbergBootnodeSetup>

12. <https://www.eosc-portal.eu>

to various alternative models discussed during the workshop: publication model relying more on preprints, launch of journals or publication platforms by research funding organisations, infrastructure based on repositories, and so on. All models must include a strong quality assurance system and better recognise and reward the work of reviewers. Aileen Fyfe pointed out that peer review was traditionally based in the scholarly community, rather than in journals per se.

Various models of peer review were discussed. The use of artificial intelligence (AI) or other

semi-automatic tools to support the process were mentioned. In the Bloxberg vision, the blockchain could include incentive mechanisms (granting of virtual tokens that could be used for recognition purposes, or to obtain some services, for example) or facilitate open peer review, and link data silos. Contributions to peer review could for instance be recorded in the blockchain infrastructure. While some participants were eager to see different kinds of methods emerging, others had reservations and favoured methods that would be more closely related to the current system.

F. Evolution of current roles and emergence of new actors

Toby Green encouraged all stakeholders to reconsider their role in the publication landscape. As an example, he suggested that scholars should take a more active role in promoting the content they publish. He added that research funders should have a more active role in the process, but that this should not only be by setting rules. They must participate in building the ecosystem of solutions. As an example, a number of funders including Wellcome, the Irish Health Research Board, and the European Commission, all provide or will provide their own publishing platforms.

Different stakeholders highlighted the obstacles they would face if they were to change their traditional role. In Italy for instance, any new quality seal or certificate mechanism for publications

must be approved by the Ministry of Education, University and Research. Currently, the ministry only endorses a list of commercial official publishers.

The creation of a blockchain by a consortium of research organisations also demonstrates a new possible role for the technology that is embraced by the research community.

Participants agreed that these initiatives contribute to a global shift in scholarly communication that should be complemented by evolutions within traditional stakeholders (change in publishers' practices) and the emergence of new players (scholars) who propose alternatives.

G. Change of culture vs. change of technologies

The lesson from history related by Aileen Fyfe was clear: no matter how innovative the technology is, only a culture shift can deliver a deep transformation.

The current culture of research evaluation, which still relies heavily on journal-level metrics, must be challenged and replaced. Research organisations that implement the principles of the San

Francisco Declaration on Research Assessment (DORA)¹³ reported on their difficulties to change scholars' ways of thinking and their old habits. In evaluation panels, an independent person from the organisation is sometimes needed in panel meetings to prevent evaluators from only using the publication avenues as proxy for the quality of the research they are asked to evaluate.

13. <https://sfedora.org>

Summary and conclusions

Throughout the workshop, participants were constantly invited to imagine how different the scholarly communication landscape could be with different tools to deliver it. Through the presentation of innovative, original, and sometimes provocative examples, participants were given starting points to encourage their reflection. Examples were debated in depth, weighing the benefits and risks involved in adopting new models. This helped expand the group's understanding on various aspects of digital transformation in scholarly communication.

The seven points described in the previous section are key issues of the publication system and are likely to guide and impact how the publishing landscape will evolve in the future. These can be summarised as follows:

- a) The research community is increasingly taking an active part in the transformation of the scholarly publishing system.
- b) Scholars nowadays need good, rapid, and long-term access to a wider variety of types of scholarly materials.
- c) The increasing amount of new knowledge created through research requires sustained investment in appropriate publication infrastructures and related services.
- d) New technologies enable enhanced functionalities in scholarly communication and services with a high added value, especially when some conditions are met, such as interoperability of data.
- e) Quality of research review and quality assurance remains a concern for the scholars and

research communities, and the new technologies may be able to assist in this task.

- f) The situation today calls for a reflection on the role of traditional actors in the publishing system and of emerging new actors.
- g) A crucial point in defining new scholarly publication systems is the interaction between technology readiness and the scholars' culture, for example on research evaluation methodologies.

Digital transformation will continue delivering on new tools (through artificial intelligence, quantum computing, blockchain, and so on) whose applications cannot yet be fully appreciated. However, although technology is a fantastic change enabler, it was not deemed sufficiently so to trigger the desired changes on its own. The audience was reminded that the human factor always plays a pivotal role in the development of new ways forward. Community building and trust are key elements, but they need facilitators and tools to sustain them. Workshop participants were therefore invited to think of common opportunities and concrete actions they could take to improve existing methods of dissemination of publicly funded research.

The outcomes of the workshop and these key points provide additional food for thought for all the stakeholders involved and feed further into the debates on scholarly communication, including the work of Science Europe and its Working Group on Open Access to Research Publications. Geraldine Clement-Stoneham closed the workshop by inviting all participants to keep the momentum going and act to develop the optimum scholarly communication made possible by the digital technologies.



ANNEX

PROGRAMME OF THE WORKSHOP

Programme

20 and 21 November 2019 // Crowne Plaza Le Palace, Brussels

WEDNESDAY 21 NOVEMBER

13.00–13.55 Welcome and Introduction

- 13.00–13.05** Welcome
Maud Evrard, Science Europe
- 13.05–13.15** Presentation of the Workshop Objectives
Geraldine Clement-Stoneham, Medical Research Council, UK Research and Innovation
- 13.15–13.40** Keynote Speech Publishing and the Scholarly Communication System – Historical Perspectives
Aileen Fyfe, University of St Andrews, UK

What is the point of publishing? More specifically, what function does ‘publication’ play in the wider system of scholarly communication? And how has this changed over time? This talk will explore the relationships between print and other forms of communication (such as orality and manuscript) in the history of academic publishing. The historical perspective reminds us that scholarly communication processes are not set in stone: they have changed, and they will change.

- 13.40–13.55** Plenary Discussion

13.55–16.20 Session 1: Reinventing the publication process

This first session will discuss whether making results openly available outside the traditional journal publication process is or could be beneficial for the research community and society.

- 13.55–14.10** Which Superpowers Could Stakeholders Use to Unblock Progress to Open Access?
Toby Green, Coherent Digital

Progress to open access has been glacial. After twenty years’ effort, roughly three-quarters of journal articles and virtually all scholarly books will be published behind a paywall this year. Why? In this session, Toby will share his analysis of why progress to Open Access has stalled and propose what measures stakeholders could take, on their own, to transform the situation. Spoiler: transformative agreements is not one of them.

- 14.10–14.20** Questions & Answers

- 14.20–15.10** Break-out group discussions

Possible questions to guide break-out group discussions:

- If you or your organisation could re-invent one aspect of the publication system, what would it be?
- What could you or your organisation do to reach this goal, and what are the limitations?
- Could your organisation take a different role in the scholarly communication landscape?
- How does your organisation deal with preprints and would generalising the posting of preprints bring any added value in the context of your organisation?
- What challenges/limitations can you see in developing the presented model(s) (eg. quality assessment, peer review, cultural)?

- 15.40–16.20** Presentation of the outcomes of the discussions in plenary

16.20–18.30 **Session 2: Innovative infrastructures to support research processes and communication**

The session will present how innovative infrastructures, new functionalities and enhanced collaborative approaches can support a transition to a landscape relying less on traditional journals.

16.20–16.35 Innovation and Sustainability through Distributed Infrastructures: from Next Generation Repositories to PubFair **Eloy Rodrigues**, Confederation of Open Access Repositories (COAR), University of Minho, Portugal

This presentation will reflect on the Pubfair vision and concept, based on COAR Next Generation Repositories recommendations. Pubfair is a modular open source publishing framework that builds upon a distributed network of repositories to enable the dissemination and quality control of a range of research outputs, including publications and data. Pubfair enables different stakeholders (funders, institutions, scholarly societies, individuals scientists) to access a suite of functionalities to create their own dissemination channels, with built-in open review and transparent processes. Such a publishing environment has the capacity to transform the scholarly communication system, making it more research-centric, dissemination-oriented and open to and supportive of innovation, while also collectively managed by the scholarly community.

16.35–16.40 Questions & Answers

16.40–16.55 Building community-owned open infrastructures for research communication **Adam Hyde**, Coko Founder, San Francisco, USA

The presentation will cover how Coko is building scholarly infrastructure by building community, and how the community built platforms are improving the speed and efficiency of publishing.

Coko is providing open source publishing infrastructure to break the hold proprietary platforms have over the scholarly communications sector. This closed source lock in is slowing the sharing of research, costing publishers and researchers more, and preventing publishing from evolving and innovating. If we are to move forward in Open Access and Open Science we need to address the cost and speed of publishing as well as open the door to new ways of sharing research. Coko addresses this by building community around their open source infrastructure – PubSweet – and sharing code and wisdom between collaborating organisations.

16.55–17.00 Questions & Answers

17.00–17.50 Break-out group discussions

Possible questions to guide break-out group discussions:

- Does your organisation support the development and management of repositories? What is the role of your organisation in this regard?
- What types of services offered by the next generation of repositories would your organisation value the most (internally and for the research community)?
- Does a collaborative approach to research and publication exist in or is promoted by your organisation? If yes, how? If no, why not?
- Does your organisation support community-led publishing platforms? If yes, how? If no, is your organisation considering supporting such initiatives in the future?
- Would a common approach towards community-owned publishing platforms be of added value?

17.50–18.30 Presentation of the outcomes of the discussions in plenary

THURSDAY 21 NOVEMBER 2019

09.15–09.25 Welcome and Summary of Workshop Day 1
Maud Evrard, Science Europe

09.25–12.05 **Session 3: How Blockchain could help redesign scholarly communication**

Central elements of the scholarly system are trust, assessment and rewards. New digital tools, such as blockchain – a decentralised, distributed ledger where recorded transactions are immutable and verifiable – could prove particularly useful and adapted to sectors relying on trust. This session will present blockchain technologies and discuss whether the research process could benefit from them, and whether these could be adapted to the research publishing context and provide added value.

09.25–09.40 Blockchain for science funding, overhead reduction and novel incentive structures
Sönke Bartling, Alexander von Humboldt Institute for Internet and Society (HIIG) & Blockchain for Science, Germany

(Last minute cancellation due to unforeseen circumstances)

09.40–09.45 Questions & Answers

09.25–10.00 Getting Science on the Blockchain – The Global bloxberg Infrastructure
Sandra Vengadasalam, Max Planck Digital Library, Germany

The bloxberg infrastructure is a secure global blockchain whose aim is to provide scientists with decentralised services and to foster collaboration among the global scientific community. For example, with consented transactions on the Bloxberg infrastructure, research claims need not be limited to one institution alone, but can be confirmed by the whole trusted network. There are more than enough concrete applications and demands for a transparent and safe online system based on blockchains in science: to verify the authenticity of data, guaranteed protection of intellectual property rights, the exchange of valuable research results, peer reviewing, the publication of papers and much more. Bloxberg's vision is to have sufficient representation from various scientific entities participating in the consortium, so that the network itself may replace traditional scientific infrastructure such as closed-access publishing of research results, among others.

10.00–10.05 Questions & Answers

10.05–10.55 Break-out group discussions

Possible questions to guide break-out group discussions

- Are there similar initiatives on the use of blockchain supported by your organisation? If yes, please describe them. If no, is your organisation considering supporting such initiatives in the future?
- Which opportunities do you see for blockchain in the research and publication processes?
- What is/should be the role of your organisation in the development of the use of blockchain in research?
- Would common principles on the use of blockchain in research be of added value?

11.25–12.05 Presentation of the outcomes of the discussions in plenary

12.05–12.20 Summary and Closing of Workshop
Geraldine Clement-Stoneham, Medical Research Council, UK Research and Innovation

© Copyright 2020

Science Europe AISBL, Rue de la Science 14, 1040 Brussels, Belgium

Science Europe is the association representing major public organisations that fund or perform excellent, ground-breaking research in Europe.

We bring together the expertise of some of the largest and best-known research organisations in the world to jointly push the frontiers of how scientific research is produced and delivers benefits to society.

We advocate science and the scientific community to help build the European Research Area and shape the global scientific agenda.

More information on our mission and activities is provided at www.scienceeurope.org

