Open Science in 2022 - Summary of the P2I Small Circle Meetup on Open Science

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Path2Integrity

Rotatory role-playing and role-models to enhance the research integrity culture

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1. Introduction

On 16 June 2022, Path2Integrity organised a conference at the Steigenberger Hotel in Kiel involving six informed stakeholders to discuss priorities for promoting open science in Europe. The stakeholders represented research-funding and research-producing organisations with different fields of interest, specifically open science infrastructure, educational and legal best practices, national and international science agents, research ethics, and the issue of reproducibility.

These stakeholders discussed how far Europe had come in the open science movement and how the quality, efficiency and creativity of research and the trust of society in science can be improved. They focussed on ways to tackle the reproducibility crisis, responding to societal challenges, accessing and sharing results, and combating the knowledge gap with respect to the FAIR principles.
Path2Integrity arranged this meeting under the so-called Chatham House Rules. Before the session started, we asked all persons invited to this meetup to accept that information from this discussion was free to use. To assure and increase the openness of the discussion, we promised not to reveal who made specific comments. Path2Integrity recorded the discussion, filtered out the main points of interest, categorised focal points and policy initiatives and produced conclusions that exemplified the meeting results from the stakeholders' statements. All six stakeholders from the discussion reviewed and accepted this report.

> Quote stakeholder A: "It is time to suggest quality criteria for open science, which connects up-to-date research, providing infrastructure, guidelines, legal aspects, and training!"

The following pages document these consolidated results of the meeting in the succeeding order: open science focal points in June 2022, important policy initiatives in June 2022, and conclusions for the year 2022.

2. Open Science focal points in June 2022

Though the stakeholders had different fields of interest, all acknowledged that open science would foster better quality research under ideal circumstances. In this regard, they underlined the following points.

2.1. Open Access

Over the last decade, traditional licenses for providing and sharing scientific literature have been adapted to reduce barriers to copying or reuse. But these adaptations are not yet commonly known in the research community. Although open access is considered a business model for the publishing industry and the scientific community has developed helpful tools such as CRediT (Contributor Roles Taxonomy) and Creative Commons Licenses to provide scientific results and to publish them, in June 2022, individual researchers very often lack information how to uphold their intellectual property rights.

2.2. Open Data

The group discussed focal point two, open data, in relation to the question: Is our world too divided for open data? They concluded that the international circumstances in June 2022 and its concentration on borders make open exchange problematic. They stressed questions like: What does that mean for the idea of open databases where everybody can search for any algorithm? And who is responsible for the open information?

The small circle group's big visions for open data in 2022 called for stability, particularly institutional stability around the infrastructure for providing research data. They stated that the next step for research infrastructure providers is to establish a reliable system for open data such as libraries did in the sixteenth century for the provision and care of books.

They emphasised, that today infrastructure issues still challenge researchers when applying both qualitative and quantitative data. Many repositories store either quantitative data or qualitative data. It is difficult for researchers to link the data from one repository with another to demonstrate that both datasets belong to the same study. Furthermore, research conducted in different countries still faces, in June 2022, the different legal requirements around questions like who needs to give consent and what are you allowed to do with the data.

2.3. Research Data Infrastructure

At the beginning of the open science movement, there was a lack of infrastructure for open research data. There have been different European, national, and regional initiatives to build effective research data frameworks in the last few years. Still, in June 2022, many researchers still do not know how to use these infrastructures. Thus, there is a lack in connecting researchers with existing infrastructure in Europe.

> "But it seems as if you are offering these research data infrastructures to infants."

2.4. Intellectual Property Rights

The group discussed legal aspects of the open science movement, in particular focal point four, intellectual property rights. Fear exists in the open science movement that regulations weaken innovation and that intellectual property rights in the open science movement will weaken its innovative character. Some experts counteract these assertions. Legal experts from the small circle meetup supported this counteraction and stated, in fact, that Europe has potent intellectual property rights, and these rights support the innovative character of the open science movement, going hand in hand with it.

2.5. Open Peer Review and Citation

Open Peer Review in the form of an open publishing of review reports alongside the relevant article was discussed. Such processes document "article version 1", reviews, "article version 2", and sometimes "article version 3", in which the article is altered strongly in line with the reviewers' comments. This challenge was considered along with the suggestion of changing the complete peer review system by highlighting in articles what the authors wrote originally compared to today's practice of referencing sources. Although the group stressed that this is essentially a challenge for electronic publishing, they concluded that it is a non-solved and borrowed burden for the open science movement in June 2022.

3. Important Policy Initiatives for Open Science in June 2022

The stakeholders agreed that many different open science courses of action are in place on the international, European, national, and regional levels, but highlighted the following:

1. European Open Science Cloud
2. New business models for scholarly communication
3. Researchers' rewards and incentives
4. Quality standards and research integrity
5. Open science skills

6. Reform of research assessment
7. Citizen Science
8. FAIR Principles

4. Most critical aspects of the open science movement in June 2022

All stakeholders in the discussion stated that engagement with different groups within the research community is indispensable in solving the following critical aspects of the open science movement.

4.1. Quality criteria

The group discussed many of the above-mentioned focal points in relation to the question: What is high-quality data/information or a high-quality result in research? Continually, they stated that the research community needs to establish quality criteria to support good research and to fulfil the open science movement's goals. The FAIR principles are a good start and describe minimum standards. Nevertheless, the research community needs more criteria to ensure high-quality results. Research infrastructure providers and research performers aligning with the status quo of today's research standards should be part of the quality criteria's establishment.

Furthermore, the group discussed from different angles, who is responsible for the quality control and quality training in open science. They emphasised that researchers and research institutions are responsible and added that research infrastructure providers must be included in the effort to maintain quality mechanisms.

The group concluded the topic quality criteria with a discussion of ethical challenges in open science, and respectively open data. Open data procedures bring ethical challenges such as data protection, human rights, and subjects' consent, which can be topics of research ethics reviews. Therefore, research ethics committees need to be included in establishing and evaluating quality criteria.

4.2. Inclusive access

As a second critical aspect, the group discussed the question: Who has access in the open access paradigm? They stated that discrimination is a blind spot of the open science movement, which has yet to be solved. Examples show that mainly high-performing countries provide money, resources, and infrastructures for open access.

4.3. Clustering academic disciplines

The third critical aspect discussed by the group relates to academic clusters. The open science movement emphasizes distinctive features in academic disciplines such as explicit and tacit research objects, different research methods, and ways research results are disseminated. The stakeholders of the discussion suggested a rethinking of the existing cluster of academic disciplines to make peer learning on how to go open easier.

4.4. Knowledge gaps

The group highlighted two parts of the critical aspect called knowledge gaps. It was the most frequently discussed aspect introduced with the question: How do early career researchers prepare for open science?
Many institutions oblige their researchers to follow open science principles but do not guide them in how to do it. Terms such as open access, open data, open resources give researchers little practical help. Although early career researchers want to join the European landscape, which is moving quickly towards open science, they don't know how.

The group stressed in part one that the decision of a scholar "to go open" can still be a slippery slope. For example, they discussed how institutions should support their researchers in working with open-access publications. They considered what that means on an individual and institutional level and who would take responsibility. The stakeholders discussed sceptically suggestions from outside the circle, which include commissioning institutional boards with the task of examining the issues critically.

> "I know of one author who did not understand open access and did not want to sign the contract with the editor. She thought the contract would waive her rights. There is a lot of confusion between authors and open science principles in academia. I think that's the main challenge we must overcome."

Next to this discussion on knowledge gaps relating to research producing practices, the group also discussed the knowledge gap in relation to the open science landscape in particular on intellectual property rights and different licenses. They concluded that even experienced open science stakeholders had knowledge gaps in this field. As outlined above, below focal point 2.4, these knowledge gaps seem to be a phenomenon originating from a missing link between the open science movement and legal representatives. From 2022 on, the open science movement will have to integrate the different legal regulations in the different countries/law systems and inform about the variety of existing licenses so that they are understandable for all stakeholders and users.

5. Conclusion

> "We need to make future researchers more like agents for building an open science community. They're not going to build infrastructure, but they'll choose how to use it. So, this is something maybe we can put in training."

The six stakeholders of open science (representing research funding organisations and research-producing organisations from different fields of interest, particularly open science infrastructure, educational and legal best practices, national and international science agents, research ethics, and the field of reproducibility) outlined overlapping takeaways for the upcoming months and years. They stated that to form links and master the next steps towards open science in Europe, the research community should establish **guidelines** and **training** for individual researchers to tackle quality criteria, inclusive access, clustering academic disciplines, and knowledge gaps in the coming months. Research performing institutions, research funding institutions, open data infrastructure providers, legal representatives from the field of property rights, and research ethics commissioners should support the design and establishment of these **guidelines** and **training**.

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