UiO : TIK – Centre for Technology, Innovation and Culture
University of Oslo

Acting responsibly through openness? Reflections on open science

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TAKING EUROPEAN KNOWLEDGE SOCIETY SERIOUSLY

Report of the Expert Group on Science and Governance to the Science, Economy and Society Directorate, Directorate-General for Research, European Commission

Ulrike Felt (rapporteur)

Brian Wynne (chairman)

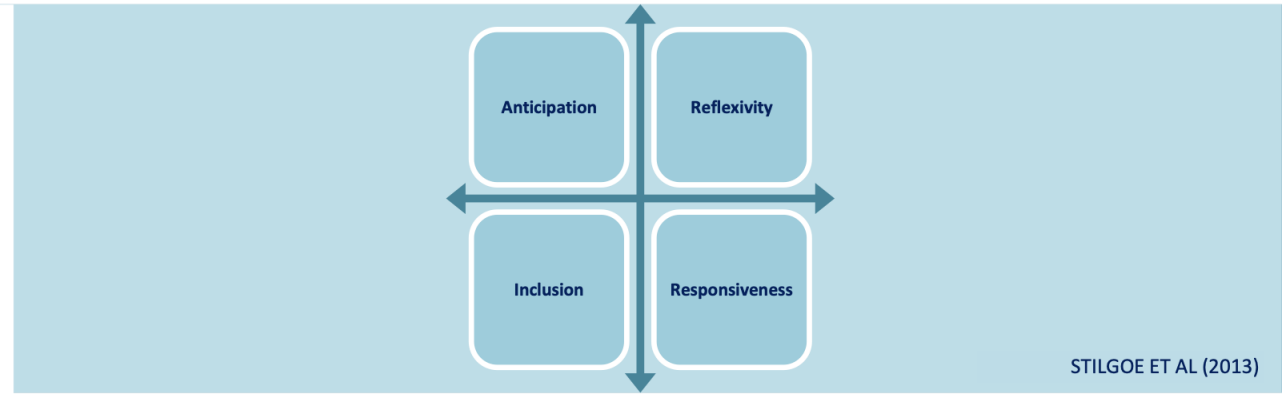
Members of the Expert group:

- 2000s Science governance: Public engagement,
  public participation, citizen science…
- Technological citizenship, epistemological pluralism, empowerment…
- Experiments in participation
- Taking publics (more) seriously

2010s ---Turn to RRI:

- From politics (including conflict, confrontation, aceptance, questioning science…- Focus on publics and citizens
- To research ethics (developing “good science and technology”)– Focus on scientists

DIMENSIONS OF RRI



The adoption and integration of these dimensions within governance, research and innovation practices (as part of RRI) help to embed the necessary ethical approach. To these can be added the dimension of ‘transparency’ or openness out of which comes shared learning.

Each dimension is considered in these guidelines for different interest groups in relation to the seven key elements of RRI. These include the original six ‘thematic elements’ set out by the European Commission (listed below) and a seventh that is concerned with protecting the **Environment**.[16] This addition followed the consultation work undertaken during the project where the absence of the environment in the original list of thematic elements was considered in need of remedy.

- **Engagement** of all societal actors and their joint participation in the RRI process
- **Gender Equality** which highlights the need to integrate the gender dimension in the research and innovation context
- **Science Education** as a means to make change happen through raising awareness and embedding RRI into educational curricula
- **Open Access** as a means to boost innovation and increase the use of scientific results
- **Ethics** aimed at increasing societal relevance and acceptability of research and innovation outcomes
- **Governance** aimed at developing a framework that integrates the aforementioned five elements

Source: https://www.great-project.eu/Deliverables10

In parallel…

European Commission

EN English

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Open Science

An approach to the scientific process that focuses on spreading knowledge as soo
available using digital and collaborative technology. Expert groups, publications, n
events.

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The EU's open science policy

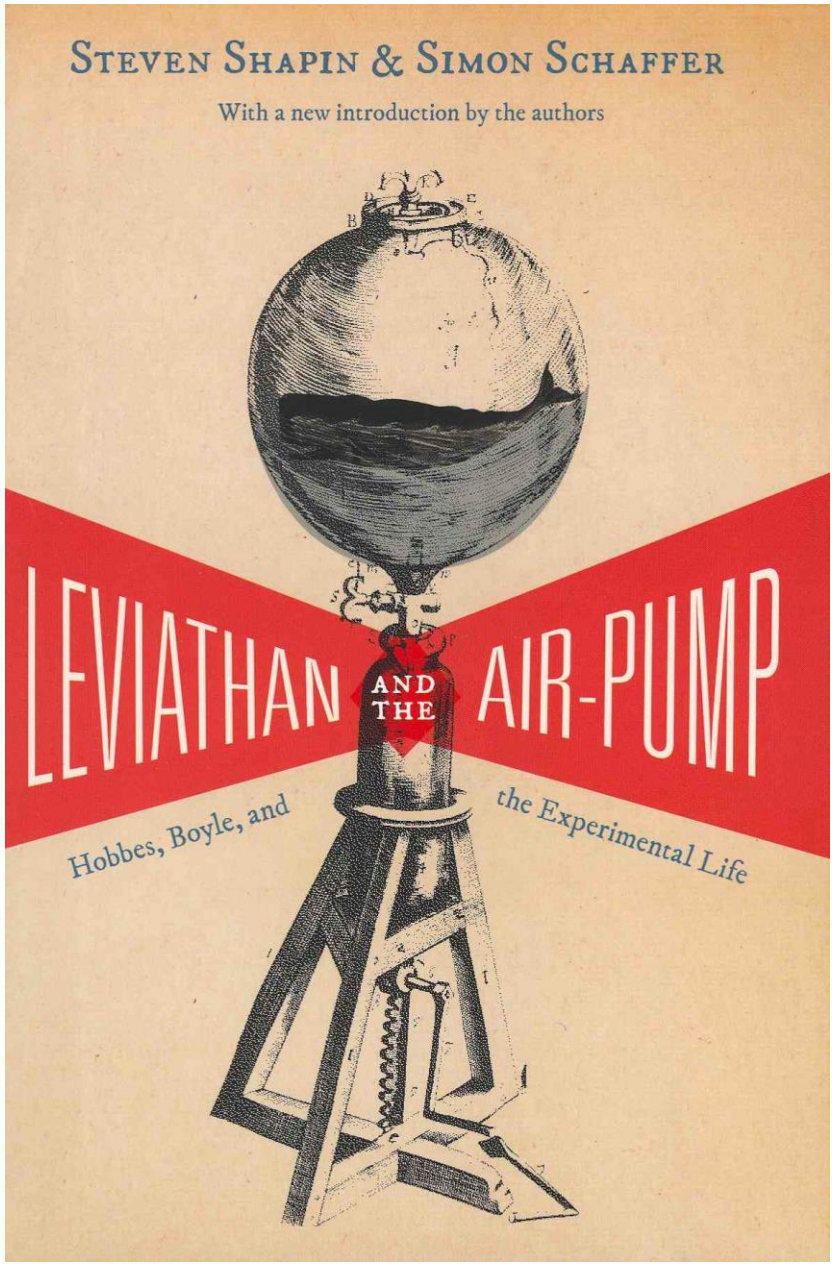
Open science is a policy priority for the European Commission and the standard method of working under its research and innovation funding programmes as it improves the quality, efficiency and responsiveness of research.

When researchers share knowledge and data as early as possible in the research process with all relevant actors it helps diffuse the latest knowledge.

And when partners from across academia, industry, public authorities and citizen groups are invited to participate in the research and innovation process, creativity and trust in science increases.

That is why the Commission requires beneficiaries of research and innovation funding to make their

”Open science” new research policy/‘openess’ in science as value not new



- Openess in science and the need for ‘public’ is not new
- Experiements as public demonstrations
- To “show” – witnessing - transparency
- Legitimation

Science on stage: Transparency

What has happened since then?

- From ”in situ” demonstrations to the scientific journal as dominant platform for knowledge communication
- From direct witnessing to remote-witnessing (peer-reviewing)
- Increased specialization and spatialization (redistributed)

- Internet/Knowledge globalization
- Gene-sequencing / large databases

- From demostrating and witnesses to pro-users
- From experimental **reproducibility** to data **reusability**

European Commission

English

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What do we talk about when we talk about “openess” in science today?

- Transparency
- Business model
- Sharing: condition for business but also technical capacity and ‘ethical’ demand

Relations between publics, science and innovation?

Talking with scientists in labs:

- They are happy to talk about open science and data
- “I work at a public university, I deposit my data in open repositories”
- Acting responsibly is depositing data in data-bases
- Recurrent idea that the public system is responsible for making things easy for industry
  – knowledge and technology provider
- Redistribution of benefits? Often not even considered
- An example from Norway: Bioprospecting the Arctic

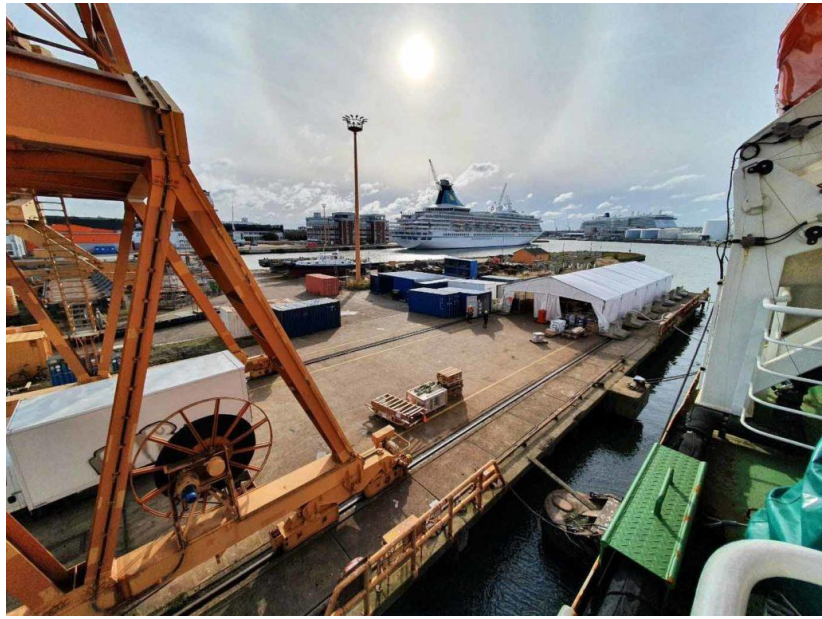

Photo: Jessie Gardner.

Creating technical capacity:
Research ethics inbuilt in data infrastructures and standards?

Enabling data flow as “good science”

FAIR Principles

In 2016, the '**FAIR Guiding Principles for scientific data management and stewardship'** were published in *Scientific Data*. The authors intended to provide guidelines to improve the **F**indability, **A**ccessibility, **I**nteroperability, and **R**euse of digital assets. The principles emphasise machine-actionability (i.e., the capacity of computational systems to find, access, interoperate, and reuse data with none or minimal human intervention) because humans increasingly rely on computational support to deal with data as a result of the increase in volume, complexity, and creation speed of data.

A practical "how to" guidance to go FAIR can be found in the **Three-point FAIRification Framework**.

Findable

The first step in (re)using data is to find them. Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services, so this is an essential component of the **FAIRification process**.

F1. (Meta)data are assigned a globally unique and persistent identifier

F2. Data are described with rich metadata (defined by R1 below)

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From FAIR data to fair data use: Methodological data fairness in health-related social media research

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Abstract

The paper problematises the reliability and ethics of using social media data, such as sourced from Twitter or Instagram, to carry out health-related research. As in many other domains, the opportunity to mine social media for information has been hailed as transformative for research on well-being and disease. Considerations around the fairness, responsibilities and accountabilities relating to using such data have often been set aside, on the understanding that as long as data were anonymised, no real ethical or scientific issue would arise. We first counter this perception by emphasising that the use of social media data in health research can yield problematic and unethical results. We then provide a conceptualisation of *methodological data fairness* that can complement data management principles such as FAIR by enhancing the actionability of social media data for future research. We highlight the forms that methodological data fairness can take at different stages of the research process and identify practical steps through which researchers can

Perceived motivations of and trust in institutions have also emerged as salient factors in public perceptions of fair use (Williams et al., 2017). Practices which would be unacceptable for commercial goals may be considered differently in case of demonstrable public gain. Identifying the expectations of social media users regarding what is fair is complicated by the complexity of SMD and what they represent, and by low levels of public understanding regarding who owns and has access to the data, and how they can be used (boyd and Crawford, 2012; Kennedy et al., 2017; Nissenbaum, 2009). Many social media users do not know who is accountable for the secondary use of their data (boyd and Crawford, 2012).

There are questions as to whether the protections put in place through legal frameworks such as the GDPR are flexible and responsive enough to ensure fairness, especially in the face of rapidly developing methodologies and applications of SMD (Halford and Savage, 2017). The contextual dependency of fairness, difficulties with identifying what is generally acceptable, variability around what is appropriate between contexts and the often conflicting interests of different groups or of different goals, all present challenges to Institutional Review Board or Research Ethics Committee assessments of SMD use (Hunter et al., 2018; Zook et al., 2017). By exercising data fairness at each stage of the research process section, we argue that careful planning and management of public goods, and issues of the environment and sustainability, education and social justice (Cullity, 2008). It has also been considered in relation to the rights and responsibilities of accessing, gathering, transforming and using big data (Kennedy et al., 2017; Nissenbaum, 2009; O'Neill, 2017). This scholarship crucially complements the implementation of the FAIR principles, which despite their misleading acronym do not address the benefits and harms arising from data management and re-use. Compliance with the FAIR principles may well make a given dataset available for computational mining, but it does not question the effects of such accessibility on data subjects and communities impacted by data-driven decision-making systems.

This same literature on distributive fairness has acknowledged that it is hard to determine equal distributions of data or equal stewardship of data, since what constitutes equal – and who is taken into account among data subjects and analysts – depends on the situation of inquiry. For example, our interdisciplinary project aimed to analyse SMD to monitor the prevalence and location of hayfever symptoms across the UK. We used Twitter data seeking mention of hayfever symptoms to see if this would provide early warning of the effects of increased pollen levels. We successfully obtained ethics approval for this research, however none of the people who sent these tweets had been informed or consented to the use of their tweets for

FAIR is not fair

But, how is enabling **access** acting responsibly? –
Transparency or **commodification**