doing it together science

Citizen Science Open Science

The potential for synergies

Erich Prem, Georg Melzer-Venturi, eutema

Claudia Göbel, Museum für Naturkunde Berlin & ECSA

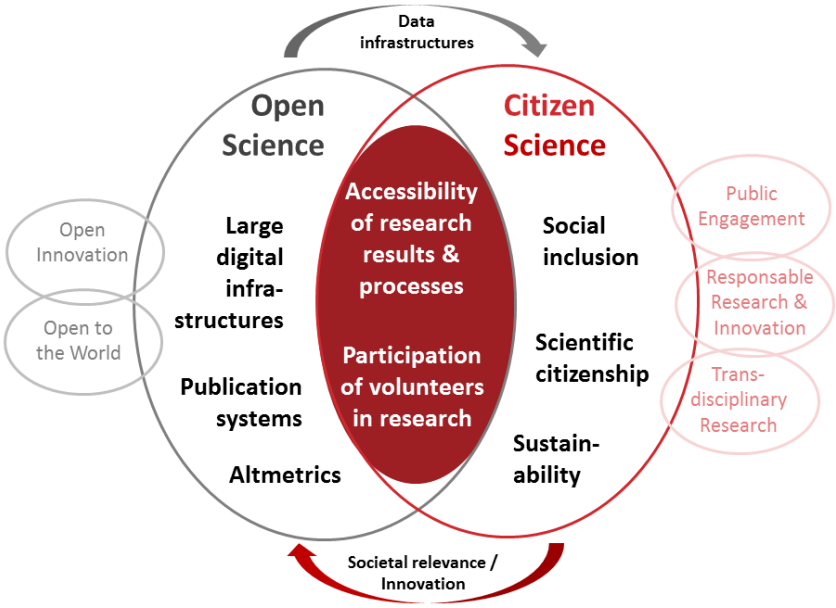
eu|te|ma TECHNOLOGY MANAGEMENT

EUROPEAN CITIZEN SCIENCE ASSOCIATION

museum für naturkunde berlin

OS/DS Links

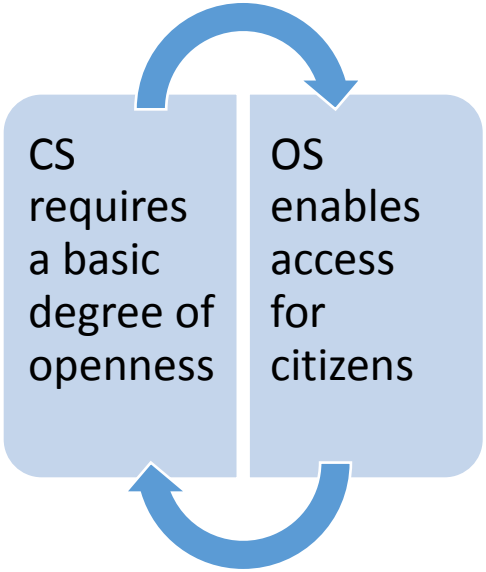
OS: a movement that seeks to make research processes more transparent, accessible and reproducible by providing punctual, transferable and reusable documentation of methods, data and results.



OS / CS sharing key common values

- OS: revealing methods, materials, investigations
  - Emphasis on open-source HW/SW, often digitally enabled and 'tangible'
- CS: invites a broad public in different phases

Reinforcing each other



Mutual benefits

- Helping to address societal challenges
- Producing shared resources for science and society
- Facilitating science/society knowledge transfer

Challenges: openness & inclusion

doing it together science

Openness

- Accessibility alone is not enough: openness requires well-documented metadata and standardized formats.
- Provide context, workflows and education to support needed for reusability by others.
- Share successful examples and case studies for implementing the FAIR Principles with CS data (Wilkinson et al., 2016).
- Improve CS practices for data management and stewardship.
- Adapt reproducibility standards to CS contexts.
- Acknowledge different types of contributions to science and find adequate ways of making them visible, traceable and reusable, regardless of whether the CS outputs are data, software or project platforms.
- Work to resolve legal uncertainties and share relevant approaches to intellectual property and licensing issues at the intersection of CS and OS.

Inclusion & Empowerment

- Expand the involvement of CS volunteers beyond data collection & analysis by opening all stages of the research cycle to participation and enabling more co-creation of research results and co-design of research projects.
- Enable more comprehensive participation and empowerment through applying methodologies beyond deficit-model engagement.
- Foster collaborative, equitable and sustainable science.
- Support OS and CS approaches in multilingual environments.
- Promote global-level dialogue and cooperation between stakeholders

eu|te|ma
TECHNOLOGY MANAGEMENT

UCL

doing it together science

Challenges: education, funding, infrastructure

Education & training

- Include CS in research education and training on OS and vice versa, and include both in general research education and training.
- Ensure means for science education and communication to accompany CS initiatives, since access to research processes doesn't automatically build scientific literacy.
- Build CS into teacher training.

Funding

- Increase and diversify opportunities for small seed funding for project prototyping and experimentation.
- Offer mechanisms for funding that address the different project characteristics of CS and OS initiatives, such as scoping phases for co-design of research agendas, flexibility in accepting changes to project execution and participants, and recognition of civil society organizations as well as citizens as applicants / grant holders.
- Include horizontal measures for community management into proposals (akin to data management plans) and supporting community management positions.

Infrastructure & Reward Systems

- Recognize / support integration of CS *as or within* research infrastructures.
  - Research infrastructures for CS (e.g. Atlas of Living Australia)
  - Part of domain infrastructures, e.g. My Ocean Sampling Day
  - CS is also a socio-technical research infrastructure in its own
- Open up / new research infrastructures for citizen scientists
- Improve mediation between institutions and individual participants, different sharing cultures, and reward systems.
- Increase understanding of CS and OS participant motivations.
- Provide support materials on CS and OS training, work structures, workflows, and acknowledgements.
- Adapt evaluation, promotion and incentive structures

eu|te|ma
TECHNOLOGY MANAGEMENT

UCL

Recommendations

OS and CS will often benefit from each other and should be jointly considered in research and innovation. While not all research will benefit to the same degree, there will often be synergies of being open and reaching out.

Explore and develop CS and OS further with attention to synergies between them. Ensure support for continuing and expanding upon existing community-driven initiatives around CS and OS. The international nature of both approaches to research should also be taken into account and cooperation fostered.

Targeted actions with dedicated support to CS and OS are still required, as both trends are still evolving. At the same time, public funding for research should broadly facilitate CS and OS to exploit its full potential. Therefore, existing systems (funding, rewards, impact assessment and evaluation) need to be assessed and adapted in order to become fit for CS and OS.

Education and training is essential. In addition, more research, critical reflection and exchange between researchers and practitioners should be fostered.

Tools and infrastructures, in particular shared ones for OS and CS, have a potential for leverage and require dedicated support. This includes considering of particular CS needs when constructing infrastructures in support of OS (and vice versa).

Conclusions

CS and OS are complex concepts in the making. Both are insufficiently understood, and there are no easy ways to survey the landscape of either paradigm.

While CS and OS save resources - they also require them, along with major shifts in cultural and social perception. They do not promise instant rewards, but offer instead substantial transformations of research and how it is rooted in our societies. CS & OS are both powerful on their own, but due to their manifest synergies, they can be even more effective when combined.

While CS practices depend on opening up science and making other adjustments to the research system, OS needs to include citizens more profoundly in order to deliver on its promises.

Further support for both OS and CS is required for an open and inclusive approach to responsible research and innovation.

Contact

Erich Prem, Georg Melzer-Venturi

eutema GmbH
www.eutema.com
Lindengasse 43, 1070 Vienna
+43 1 5245316

{prem, melzer} @ eutema.com
@ErichPrem

DITOs: togetherscience.eu
@TogetherSci