The EC's Open Science policies 2015-2019 Contributing to an open (and ethical) research environment

Taylor and Francis Scholarly Summit
2 july 2019
Amsterdam

JC Burgelman

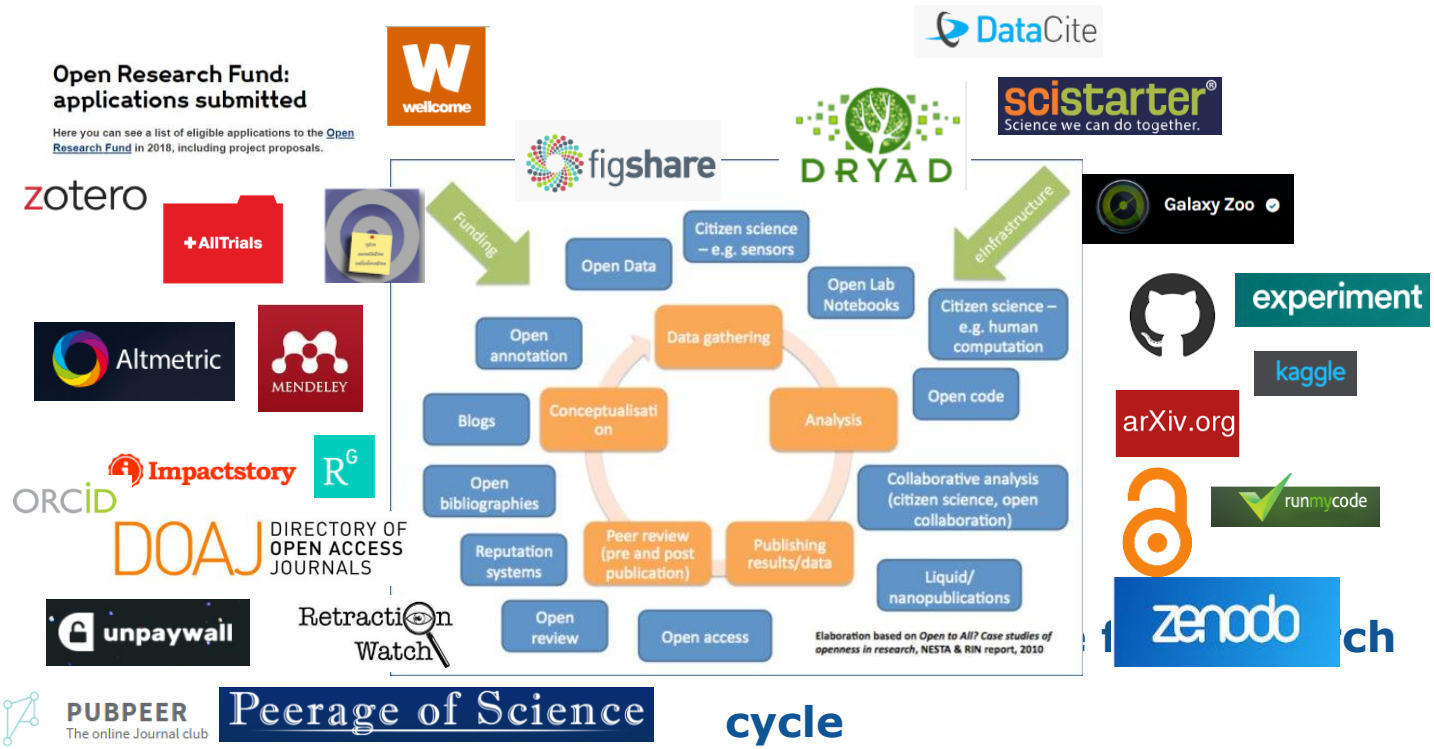
European Commission, DG RTD

Structure

1. Why this policy
2. What were the main priorities
3. What was realized
4. What is still missing or incomplete

Rationale: The nature of science (modus operandi) is changing from a closed system to an open and sharing one

European Commission



cycle

Why Open Science Policy

European Commission

- Better ROI of the R&I investments: self evident: if all the results of our public research are made reusable, it will follow that better use is made.
Norori: Eco impact Human Gnoom sequencing: 1 billion eco output, 4 million jobs, 30% more genetic testing, innovative new methods, cures etc)

- Faster circulation of new ideas: we have 22 million EU SME's that will have access to top notch research without having to significantly pay for it!

- More transparency of the science system: the public taxpayer has this right & and it helps auto correction of the system

- Fit for 21st century science purpose: all grand societal challenges NEED cross disciplinary research

Very Promising

European Commission

Structural gnomics consortium

Public–Private Partnership

Public Domain

Commercial

Tools & Basic Knowledge
NOVEL Proteins only!

- Structure
- Chemistry
- Antibodies
- Screening
- Cell Assays

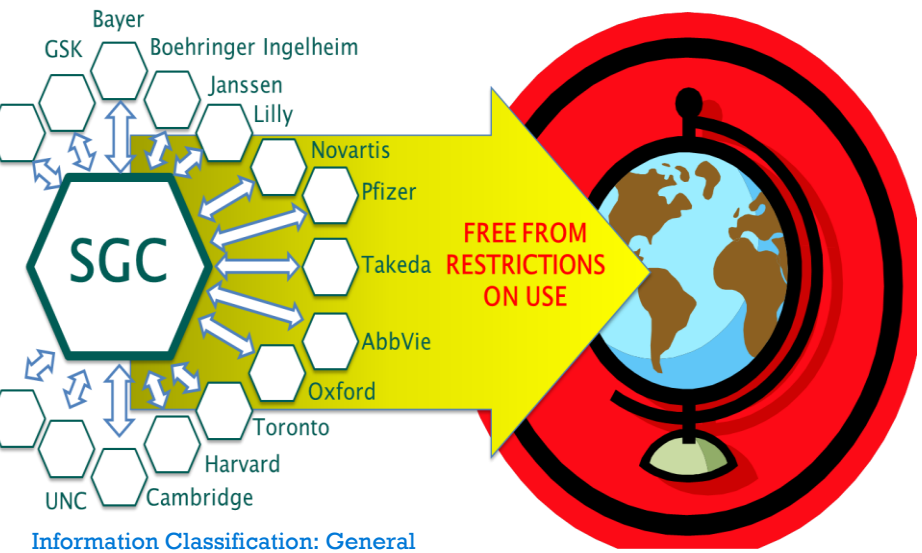
Discovery and Exploration

- No patent
- No restriction on use
- Open access to tools and data.
- Target identification & validation

Drug Discovery and Development

Facilitated by access to increased amount of information in the public domain

- (re)Screening
- Lead Optimisation
- Pharmacology
- Metabolism
- Pharmacokinetics
- Toxicology
- Chemical development
- Clinical development



Weigelt J. EMBO Reports **10**:941-5

Very Promising for ALL sciences

European Commission

File Edit View History Bookmarks Tools Help

EurekAlert! Science News | My RTD Intranet - Homepa... | The 'time machine' recons...

http://www.nature.com/news/the-time-machine-reconstructing-ancient-venice-s-social-networks-1.22147

nature venetian time machien

Most Visited Getting Started

nature.com : Sitemap

Login : Register

nature International weekly journal of science

Search Go

Advanced search

Home | News & Comment | Research | Careers & Jobs | Current Issue | Archive | Audio & Video | For Authors

Archive > Volume 546 > Issue 7658 > News Feature > Article

E-alert RSS Facebook Twitter

NATURE | NEWS FEATURE

The 'time machine' reconstructing ancient Venice's social networks

Machine-learning project will analyse 1,000 years of maps and manuscripts from the floating city's golden age.

Alison Abbott

14 June 2017

PDF Rights & Permissions

Time travel

The 'time machine' reconstructing ancient Venice's social networks

Machine-learning project will analyse 1,000 years of maps and manuscripts from the floating city's golden age.

Like Share You and 355k others like this.

Recent | Read | Commented

1. Ancient oak's youthful genome surprises biologists
   Nature | 19 June 2017
2. Macron consolidates electoral victory
   Nature | 19 June 2017
3. Swipe right for science: Papr app is 'Tinder for preprints'
   Nature | 16 June 2017

Sense of ''urgency'' we tend to underestimate mid to long term disruption

- How AI will <u>also</u> change science is most likely to be the new disruption
- It will deeply affect research, education and management of science performers and institutions (D. Gann, Imperial College)
- AI will automate what it can … a lot of science practices are automatable
- Policy lessen: open environments, support disruption and risk taking

Key priorities 2016, -

European Commission

Use and management of research results

1. FAIR data: FAIR data sharing is the default for funding scientific research

2. European Open Science Cloud: all EU researchers are able to deposit, access and analyse European scientific data through EOSC, without leaving their desk

3. Indicators: alternative metrics (next generation metrics) complement conventional indicators for research quality and impact (e.g. JIF and citations)

4. Future of scholarly communication: all peer reviewed scientific publications are freely accessible and early sharing of different kinds of research outputs is encouraged

Alignment of research partners

5. Rewards and incentives: the European research career evaluation system fully acknowledges Open Science activities

6. Research Integrity: all publicly funded research in the EU adheres to commonly agreed Open Science standards of research integrity

7. Skills and education: all scientists in Europe have the necessary skills and support to apply Open Science research routines and practices

8. Citizen Science: citizens significantly contribute and are recognised as valid knowledge producers of science

Pointer: Amsterdam Call for Action on OS (policy priorities identified from 12 action items)

Open access

European Commission

Key objective

- Work with all stakeholders and EU Member States for the alignment of OA policies and support implementation in H2020

Main achievements

- Revision of the Recommendation on Scientific Information, Public Sector Initiative Directive and EU Copyright Directive (2018)
- EC Expert Group on the future of scholarly communication report (January 2019)

Next

- Follow-up on legal and regulatory aspects (incl. Plan S)
- Second tender on open access publishing platform (spring 2019)
- Procurements (monitoring of and support to H2020) and reports

Pointer: Open Access web page

FAIR (open) data

European Commission

Key objective

- Implement FAIR data in EOSC, and beyond

Main achievements

- FAIR embedded in several 'EOSC documents': Communication (2016), Declaration (2017), Council Conclusions (2018)
- Study (June 2018) with cost-benefit analysis
- EC FAIR data Expert Group report (November 2018)

Next

- Collaboration with EOSC Working Groups
- FAIR-compliant certification scheme for data infrastructures and policy on Persistent Unique Identifiers in EOSC (end 2019)
- Horizon 2020 project-funding

FAIR (open) data

European Commission

Directive on open data and the re-use of public sector information (adopted 6-2019)

•(Article 1) Research data falls now within the scope of the Public Sector Information Directive

•(Article 10) MS shall adopt national policies & relevant actions to make publicly funded research data openly available by default, in line with FAIR principles & "as open as possible, as closed as necessary"

•(Article 10 + Recital 28) **Research data which are already publicly available through repositories shall be re-usable** (but no extra cost for the retrieval of the datasets should be imposed, no additional curation of data should be required to comply with this obligation)

•(Recital 28) **MS may extend the application of this Directive to research data made publicly available** through other data infrastructures than repositories, through OA publications.

European Open Science Cloud

European Commission

Key objective

- Adapt research infrastructures for Open Science and develop a common, federated, European framework (ecosystem) for publicly-funded research data

Main achievements

- Implementation roadmap and launch (March & November 2018)
- Two Expert Group reports (FAIR & EOSC in practice)

Next

- Implementation including FAIR certification schemes for repositories, FAIRsFAIR project etc.
- Mapping of EOSC-relevant national initiatives (end 2019)
- Evaluation by EC and EU Member States (end 2020)

Pointer: EOSC web page

Indicators

Key objective

- Develop and employ, for the development of Open Science, non-traditional metrics that cover not just citation of articles (i.e. what was initially named 'Altmetrics')

Main achievements

- Report from the first Expert Group on Altmetrics (2017)
- Second Expert Group on indicators for researcher's engagement with Open science and its impacts (2018)

Next

- Report on concrete and implementable indicators to be released in June 2019 and discussed with OSPP in October 2019

Pointer: Expert Group on Indicators web page

Open Science Monitor

European Commission

Key objective

- Get some quantitative and qualitative insights on the ongoing development of open science practices (this is not an assessment tool)

Main achievement

- Two public procurement contracts launched and implemented in a sequential way, with a web-based demonstration in place

Next

- Monthly updates till the end of 2019
- Improvement of the Monitor once the EU has a more open and transparent data infrastructure for publicly funded research (notably with a full implementation of the EOSC)

Pointer: Open Science Monitor web page

Citizen Science

European Commission

Key objective

- Citizens significantly contribute and are recognised as valid knowledge producers of European science (part of dimensions supported by Responsible Research and Innovation)

Main achievement

- OSPP report on citizen science (incl. recommendations)
- Horizon 2020 project-funding

Next

- Reports on good practices in citizen science to be produced in 2019 to inform development of two citizen science toolkits
- Conference on citizen science towards the sustainable development goals (Berlin, second half of 2019)
- Systemic approach in Horizon Europe

Rewards and skills

European Commission

Key objectives

- Encourage, support and incentivise researchers to practice Open Science, with a focus on both research performing and research funding organisations

Main achievement

- Final reports of Expert Groups on Rewards and Skills
- OSPP makes rewards for Open Science a priority

Next

- Follow-up, in particular embed rewards for Open Science in the modernisation of European universities

Research integrity

European Commission

Key objectives

- Set European standards to foster research integrity in the development of Open Science, in particular having in mind the relation between science and society

Main achievement

- Mutual learning exercise on research integrity (led by EU MS)
- Support to the European Network on Ethics and Research Integrity, and European Network of Research Integrity Officers
- Horizon 2020 project-funding

Next

- Fully address Open Science in the European Code of Conduct with the aim of a full implementation in the Framework Programmes

Open Science in Horizon Europe

European Commission

Horizon Europe goes beyond open access (publications & data) to embrace and incentivize open science as *modus operandi*

1. Clarifies and strengthens the **open access obligations** while **empowering authors** of scientific publications
2. Sets obligations towards **FAIR and open data sharing**, and **data management**, while complying with IPR rules and exploitation obligations
3. Promotes compliance with **open science principles** through a combination of obligations and incentives
4. Implements **sanctions** for those beneficiaries that repeatedly and consistently fail to provide the required open access, requiring **institutions** to assume responsibility for their intellectual output
5. Introduces the use of **new generation metrics** for better assessing the impact of research output and the engagement in open science

Possible scenario for incorporation of Plan S principles in Horizon Europe

European Commission

Open access via repositories kept but made immediate

- Embargoes not accepted any longer

Copyright retention and open license asked for

- Copyright retention already in the HE Regulation
- Open license to be required (in line with new standard licence adopted by the EC for its own information production)

Publication in hybrid journals allowed

- However, costs not to be eligible

Research data in Horizon Europe

European Commission

Mandatory Data Management Plan

- When there is research data generated, collected, re-used…

Open by default

- Unless it cannot be (exceptions will apply- we will not use the term ‘opt-out’ any more)

Open access/data management disambiguated

- Different from current situation

Use of European Open Science Cloud required

- In some Work Programmes

In one word: OS became central in the R&I funding programmes

European Commission

2008

FP7

OA **Pilot**

Deposit and open access

2014

Horizon 2020

OA **Mandatory**

Deposit and open access

& ORD/DMP **Pilot**

2017

Horizon 2020

OA **Mandatory**

Deposit and open access

& ORD/DMP **by default (opt-out)**

2021

Horizon Europe

OA **Mandatory**

Deposit and open access

DMP in line with FAIR **Mandatory**

ORD **by default (exceptions)**

& Open Science **embedded**

What does this mean for the researcher? (1)

The norm is/will become

- Publications - immediate OA: quicker and cheaper
- Data – mandatory OD: public funded research is a reproducible public good. Both already mandatory in EC. Increasingly other funders (SE) in particular the big private ones (Welcome trust, Gates etc)
- FAIR will be the standard
- DMP universally required
- Next Generation Metrics (see the Metrics Toolkit)
- MORF (massive online open research flows)
- All science will be data driven → Data science literacy (and potentially new career paths e.g. data scientists, start-ups, science diplomacy)

What does this mean for the researcher? (2)

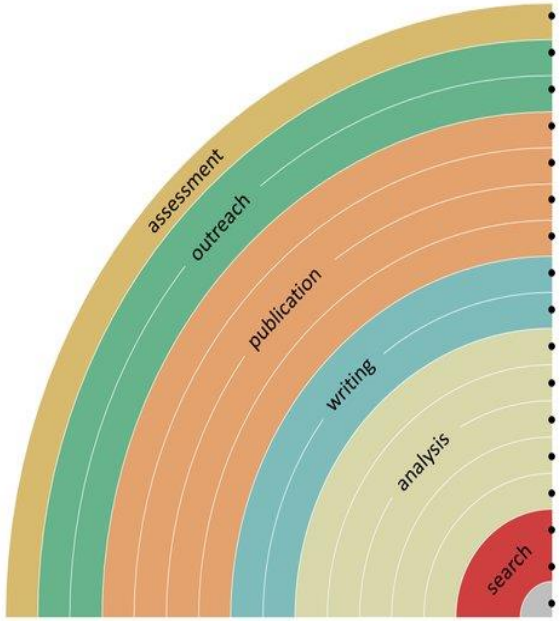
It will allow

- Faster & better publication:
- Richer publication opportunities: the whole research value chain (not only HI pub)
- Return to some basics. E.g. open peer review is nothing more than peer review as it used to be
- Richer measurement of scientific activity (see the Metrics Toolkit)
- Different career paths
- More research potential in the disciplines
- More transparency

The tools to do it are all there, basically for free

European Commission

You can make your workflow more open by ...



- adding alternative evaluation, e.g. with altmetrics
- communicating through social media, e.g. Twitter
- sharing posters & presentations, e.g. at FigShare
- using open licenses, e.g. CC0 or CC-BY
- publishing open access, 'green' or 'gold'
- using open peer review, e.g. at journals or PubPeer
- sharing preprints, e.g. at OSF, arXiv or bioRxiv
- using actionable formats, e.g. with Jupyter or CoCalc
- open XML-drafting, e.g. at Overleaf or Authorea
- sharing protocols & workfl., e.g. at Protocols.io
- sharing notebooks, e.g. at OpenNotebookScience
- sharing code, e.g. at GitHub with GNU/MIT license
- sharing data, e.g. at Dryad, Zenodo or Dataverse
- pre-registering, e.g. at OSF or AsPredicted
- commenting openly, e.g. with Hypothes.is
- using shared reference libraries, e.g. with Zotero
- sharing (grant) proposals, e.g. at RIO

DOI: 10.5281/zenodo.1147025

Still a long way to go

By 2030 the science system will be characterised by

- Open research data as a renewable resource for research and innovation (via EOSC)
- Full & immediate open access to the whole life cycle of a research process
- A system of peer reviewed open access research workflows
- Multiple ways to measure and reward scientific productivity
- ‘’liquid’’ science (like in SW development)

- More ethical? Only – if embedded in codes of conduct and (at least) doctoral training

What's left?
We know that Europe leads this OS movement…for the moment

- We have a history of leading with ICT, but losing out in the end

- The powers that be are astonishingly strong … even in the good world of science

- **Scientists like intellectual disruptions, not institutional ones…. need a big cultural change** (Leru 2018 paper)

European Commission

I wish I could start my research career now

1. Never were the exogenous factors so good for science (budgets, trajectories, support, etc)

2. Never were the endogenous factors so favourable to do good science (open science is making your life easier)

3. Never was there so much need for good science (see Harari 21 lessons if you don’t know where to start research on)

European Commission

Thank you

http://ec.europa.eu/research/openscience/index.cfm