The future of science is open
Rationale, goals and milestones of the EU policies

Jean-Claude Burgelman, Head of Unit Open Science, DG RTD

Christophe Rossel, IBM, EPS, SCNAT, OSPP

SCNAT Workshop Open Data, Bern, 29 Oct. 2018
The rationale...
The nature of science modus operandi

... from a closed system to an open and sharing one
Open Science is a systemic transition of science system affecting how:

• research is performed
• knowledge is shared/diffused/preserved
• research projects/results are evaluated
• research is funded
• researchers are rewarded
• future researchers are trained

Affecting the whole research cycle and all its stakeholders

✓ A typical techno-economic paradigm shift (technology, market and institutional change go hand in hand)
✓ or to put it differently: disruptive and hence disturbing....
OS offers great opportunities for science, scientists & society

- **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

- **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

- **Fit for 21st century science purpose**: all grand societal challenges NEED cross disciplinary research
"As I see it, European success now lies in sharing as soon as possible, (...). The days of open science have arrived."

Speech at "Presidency Conference Open Science", 4 April 2016, Amsterdam
2016 - Holistic Policy Agenda: scope & ambitions

... 4 with regard to the use & management of research results and data

✓ Open Data: FAIR data sharing is the default for funding scientific research

✓ Science cloud: All EU researchers are able to deposit, access and analyse European scientific data through the open science cloud, without leaving their desk

✓ Altmetrics: Alternative metrics (next generation metrics) to complement conventional indicators for research quality and impact (e.g. Journal Impact Factors and citations)

✓ Future of scholarly communication: All peer reviewed scientific publications are freely accessible (OA)
Eight Policy Priorities

... 4 with regard to relations with research actors (researchers, institutions and funders)

- **Rewards**: The European research career evaluation system fully acknowledges Open Science activities
- **Research Integrity**: All publicly funded research in the EU adheres to commonly agreed Open Science Standards of Research Integrity
- **Education and skills**: All young scientists in Europe have the necessary skills and support to apply Open Science research routines and practices
- **Citizen Science**: CS significantly contribute and are recognised as valid knowledge producers of European science
Open Science Policy now

- **Mandatory Open Access to Publications:**
  2014: mandatory
  2018: launch of *Open Access Publishing Platform* (stand-alone peer reviewed scientific articles and pre-prints from H2020 projects)

- **Open Access to Research Data:**
  2017: ORD Pilot (2014) is extended to entire H2020;
  Data is *as open as possible, as closed as necessary*;
  FAIR Research Data Management Plans (DMP);
  2018: *Revised Recommendation on Scientific Information* (25 April)

- **European Open Science Cloud:**
  2018: *launch of the 1st phase* (adoption of working document)
  official event: 23 Nov. 2018 in Vienna (Austrian presidency)

- **Rewards and Skills**
  2017: new matrix proposed by OS working groups (new reports available)
The evolution of the EU funding programmes for R&I

2008
FP7
OA Pilot
Deposit and open access

2014
H2020
OA Mandatory
Deposit and open access
& ORD/DMP Pilot

2017
H2020
OA Mandatory
Deposit and open access
& ORD/DMP by default (opt-out)

2020
Horizon Europe
OA Mandatory
Deposit and open access
DMP + FAIR data Mandatory
ORD by default (opt-out)
& Open Science Embedded
Opt-out reasons

AS OPEN AS POSSIBLE, AS CLOSED AS NECESSARY

Top three reasons for opt-out:

- **privacy**
- intellectual property rights
- might jeopardise project's main objective
Open Science Policy Platform

OSPP-M2: 2018 – 2019: implementation (stakeholders events)

European Open Science Agenda:
- OA publishing models
- FAIR open data
- Science Cloud
- Alternate metrics
- Rewards & careers
- Education & skills
- Citizen Science
- Research integrity
- ...

ERA & framework conditions for actors:
- European Charter for researchers
- Code of conduct for Research Integrity
- Charter for Access to Research Infra
- ...

DSM & framework conditions for data:
- Copyright - TDM
- Data Protection
- Free Flow of Data
- ...

Wide input from stakeholders:
- ad-hoc meetings and workshops
- e-platform with wider community
- reports and independent experts
  - EG on open science cloud
  - EG on altmetrics
  - EG on alt. business models for OA publishing
  - EG on FAIR open data

European Commission

advice
opinions
context
25 members from eight stakeholder groups:

- **Universities:** EUA, LERU, CEASAR, ACEU, YERUN
- **Research Organisations:** EARTO, EMBO, EU-LIFE, ENoLL
- **Academies/Learned Societies:** EPS, EUChEMS, YEAR, GYA
- **Funding Organisations:** Science Europe (Plan S)
- **Citizen Science Organisations:** ECSA
- **Publishers:** STM, OASPA
- **Open Science intermediaries:** RDA, F1000, OpenAIRE, EGI, DARIAH, GEANT, Business Europe
- **Libraries:** LIBER
Integrated Advice on 8 ambitions

Document adopted on 22 April 2018, for submission to Carlos Moedas

Presentation on 29 May 2018 at the Competitiveness Council on Research and Innovation in the multiannual financial framework (MFF)

OSPP recommendations are based on expert groups’ reports and internal consultation

a) General recommendations

1. appoint national coordinators & task forces on OS
2. ensure scholarly infrastructure with adequate standardized identifiers for researchers and outputs
3. develop a culture of OS at institutional level with codes of ethics and integrity
4. foster OS literacy, skills training in whole educational system
5. develop Europe-wide campaign to raise awareness

https://ec.europa.eu/research/openscience/pdf/integrated_advice
b) Specific recommendations split into eight priorities

- Rewards and Incentives
- Research Indicators and Next-Generation Metrics
- Future of Scholarly Communication
- European Science Cloud
- FAIR Data
- Research Integrity
- Skills and Education
- Citizen Science

Major stakeholder groups having responsibility to drive actions stated in recommendations
FAIR and Open Data

Actions

• Ensuring, through the Model Grant Agreement, that research data is open by default according to the principle 'as open as possible, as closed as necessary'.

• Making the development and implementation of a DMP an obligation and a mandatory element of the Model Grant Agreement for all projects (even if opt out)

• Ensuring that Research Data Management is carried out in compliance with the FAIR principles in order to be EOSC compatible
Milestones...
European Commission policies: systematic and growing support

- EC Communication on Scientific Information
- FP7 OA Pilot
- Recommendation on OA to and preservation of scientific information
- Communication on European Research Area (ERA)
- Horizon 2020 OA and Open Research Data (ORD) policies
- Digital Single Market (DSM) strategy
- European Cloud Initiative Communication (ECI)- The European Open Science Cloud
- Revision of the 2012 Recommendation on OA in conjunction with recast of the Public Sector Information (PSI) Directive (as part of Data Package)
- Launch of the first phase of the EOSC
- Preparing Open Science for Horizon Europe
Public sector is the most data intensive sector:
expected economic value:
from 52billion EUR in 2018
to 194billion EUR in 2030!
Federating existing initiatives to create a trusted virtual environment for enabling data driven science across boundaries and disciplines in Europe

Initiated in 2016: Vision for EOSC
**EOSC policy milestones**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2017</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; EOSC Summit forming the coalition of the willing parties</td>
</tr>
<tr>
<td>Oct. 2017</td>
<td>EOSC Declaration published for endorsements and to seek commitments</td>
</tr>
<tr>
<td>March 2018</td>
<td>EOSC Roadmap presented for consultation to Council’s WGs</td>
</tr>
<tr>
<td>May 2018</td>
<td>Council conclusions endorsing the EOSC Roadmap</td>
</tr>
<tr>
<td>June 2018</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; EOSC Summit</td>
</tr>
<tr>
<td>Fall 2018</td>
<td>Establishment of the Governance structure; MS designate representatives to the EOSC board. Selection of members to the governance structure</td>
</tr>
<tr>
<td>Nov 2018</td>
<td>Launch of the EOSC governance structure (Austrian Presidency, Vienna)</td>
</tr>
<tr>
<td>End 2020</td>
<td>MS+ EC agreement on the future strategic orientation and financing scheme for the EOSC</td>
</tr>
</tbody>
</table>
# EOSC Governance - roles

<table>
<thead>
<tr>
<th>Membership</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EOSC Board</strong></td>
<td><strong>To oversee &amp; steer</strong> the EOSC strategy and implementation**&lt;br&gt;<strong>Review and decide</strong></td>
</tr>
<tr>
<td>Member States/Associated Countries and EC representatives</td>
<td></td>
</tr>
<tr>
<td><strong>EOSC Executive Board</strong></td>
<td><strong>To help &amp; support</strong> the EOSC strategy, implementation, monitoring and reporting on progress of implementation**&lt;br&gt;<strong>Elaborate and propose</strong></td>
</tr>
<tr>
<td>Stakeholder representatives and individual experts</td>
<td></td>
</tr>
<tr>
<td><strong>Stakeholders Forum</strong></td>
<td><strong>To advise</strong> the Executive Board and reach-out to the scientific community**&lt;br&gt;<strong>Provide input and feedback</strong></td>
</tr>
<tr>
<td>Stakeholders organisations; e.g. scientific/user community, universities, research institutions, research infrastructures, eInfras</td>
<td></td>
</tr>
</tbody>
</table>
Survey on Open Science and Career Development for Researchers 2018
prepared for the European Physical Society (EPS)

Survey addressed to European Physicists (1st Quarter 2018)

The survey had 58 questions covering the following 4 chapters

1. Biography: 12 questions
2. Open Science: 5 questions
3. Open Data: 15 questions
4. Open Access: 10 questions
5. Career Development: 16 questions or comments

330 participants: 73% male, 24% female from 27 countries (D, I, UK, F, CH,...)
28% professors, 25% senior researchers, 18% PhD students
76% at university, 17% at public/gvt research institute
94% Physical Science, 4% Engineering, 1% Math
Have you followed training courses on data management?

- 53%: no, I do not need to
- 34%: no, I would like to
- 9%: yes, they were not useful
- 4%: yes, they were useful

Essentially no!

Have you used a data management plan in your research?

- 29%: no, I do not know what a data management plan is
- 16%: no, I do not need to
- 16%: no, I would like to
- 8%: yes, it was not required
- 7%: yes, it was required by my funding body
- 5%: yes, it was required by my institution
- 5%: yes, it was required by my institution and funding body

Essentially no!
Who is responsible for archiving your research data?

First choice

- 77% mainly myself or project/group employee
- 10% institutional data repository
- 5% institutional IT centre
- 4% project or group employee
- 2% library
- 1% other
- 2% external service provider
- 4% I do not know

To whom do you usually grant access to your research data?

First choice

- 41% mainly to own research group, institution, community and interested persons by request.
- 18% my specific scientific community
- 14% members of my institution
- 12% other
- 9% interested persons by request
- 2% my data is kept private
- 1% my data is open to everyone
- 3% I follow guidelines from my funder

Survey on OD, ODM
### Survey on OD, ODM

**What would keep you from sharing your research data with others? first choice**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal data protection and confidentiality</td>
<td>50.6</td>
</tr>
<tr>
<td>Legal restrictions (e.g. copyright, patent...)</td>
<td>15.5</td>
</tr>
<tr>
<td>Increased time and effort required</td>
<td>10.1</td>
</tr>
<tr>
<td>Nothing</td>
<td>6.1</td>
</tr>
<tr>
<td>Lack of skills</td>
<td>5.8</td>
</tr>
<tr>
<td>Financial costs</td>
<td>5.2</td>
</tr>
<tr>
<td>Risk of misinterpretation and/or feasibility</td>
<td>1.8</td>
</tr>
<tr>
<td>Lack of clear advantages in sharing data</td>
<td>1.5</td>
</tr>
<tr>
<td>Increased competition in the 'publish or perish'</td>
<td>1.5</td>
</tr>
<tr>
<td>Lack of institutional guidelines for data</td>
<td>0.9</td>
</tr>
<tr>
<td>Other</td>
<td>0.6</td>
</tr>
<tr>
<td>Economic competitiveness/undesirable business</td>
<td>0.3</td>
</tr>
</tbody>
</table>

---

*What would keep you from sharing your research data with others? first choice.*

Survey on OD, ODM
Thank you!

More information at
http://ec.europa.eu/research/opengovernment