The Future Infrastructure for Open Science

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Contents

A time of plenty?

- Open Science rollout
- The constituents of Open Science
  - Open Access to Publications
  - Research Data Management
  - Open Science Cloud
- Next Steps for Open Science
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Open Science – the Motivation

- **Validation** of the results of the EU’s public consultation on *Science 2.0: Science in Transition* now published
- Science 2.0 now renamed ‘Open Science’
- **Trends in Open Science**
  - Significant increase in scientific production
  - New ways of doing Science (data-intensive science)
  - Increased number of actors and addressees of science

King’s Cross Station, London
Barriers to Open Science – for individual researchers

- Academic issues and concerns around Career progression seen as the biggest barriers
### % Agreement for Policy actions (abbrev.)

<table>
<thead>
<tr>
<th>Question/Issue</th>
<th>Need to Intervene</th>
<th>Need to Intervene</th>
<th>Req’d Action</th>
<th>Req’d Action</th>
<th>EU Action</th>
<th>EU Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foster Open Science – raise awareness</td>
<td>52%</td>
<td>4%</td>
<td>48%</td>
<td>4%</td>
<td>19%</td>
<td>4%</td>
</tr>
<tr>
<td>Traditional Metrics do not capture Open Science</td>
<td>22%</td>
<td>7%</td>
<td>22%</td>
<td>7%</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>Develop research infrastructures</td>
<td>56%</td>
<td>4%</td>
<td>11%</td>
<td>4%</td>
<td>48%</td>
<td>4%</td>
</tr>
<tr>
<td>OA to publications and data</td>
<td>63%</td>
<td>11%</td>
<td>33%</td>
<td>26%</td>
<td>26%</td>
<td>11%</td>
</tr>
</tbody>
</table>

- The most significant total in the Validation exercise
- Not much interest in any intervention
Open Science – broad policy lines

- 5 broad policy action lines (from public consultation, validated by stakeholders incl. Member States and endorsed in Digital Single Market):
  1. Fostering and creating incentives for open science
  2. Removing barriers for open science
  3. Mainstreaming and further promoting open access policies
  4. Developing an open science cloud
  5. Embedding open science in society to make science more responsive to societal and economic expectations
Open Science – top-level ambitions/1

- 4 top-level ambitions with regard to the use & management of research results and data:
  1. Open Data: FAIR data sharing is the default for funding scientific research
  2. Science cloud: All EU researchers are able to deposit, access and analyse European scientific data through the open science cloud, without leaving their desk
  3. Altmetrics: The role of alternative metrics in replacing/complementing conventional indicators for research quality and impact (e.g. Journal Impact Factors and citation counts)
  4. Changing business models for scientific publishing: All peer reviewed scientific publications are freely accessible
Open Science – top-level ambitions/2

- 4 top-level ambitions with regard to relations with research actors (researchers, institutions and funders):
  1. Rewards: The European research career evaluation system fully acknowledges Open Science activities
  2. Research Integrity: All publically funded research in the EU adheres to commonly agreed Open Science Standards of Research Integrity
  3. Education and skills: All young scientists in Europe have the necessary skills and support to apply Open Science research routines and practices
  4. Citizen Science: Citizen scientists significantly contribute and are recognised as valid knowledge producers of European science
Open Science – governance

Steering Group of the Open Science Policy Platform
(20+ Members, co-chaired by the Commission, meets bi-annually)
Mandate:  
- Help develop the Open Science Policy Agenda
- Promote uptake of agreed best policy practices

Framework conditions for data:
• Copyright - TDM
• Data Protection
• DSM - Free Flow of Data
• ...

Framework conditions for actors:
• ERA
• European Charter/Code for researchers
• Code of conduct for Research Integrity
• ...

WG
- FAIR
- Open data

WG
- Science
- Cloud

WG
- Altmetrics

WG
- Scientific
- publishing models

WG
- Rewards

WG
- Research
- Integrity

WG
- Education
- & Skills

WG
- Citizen
- Science
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Open Access a central tenet

- Open Access Policies

Il Duomo, Milan: East Window
Routes to Open Access

Open Access Policies using Green and Gold Criteria by Policymaker

From Tableau:

Open Access Policies: Green and Gold Criteria by Policymaker type

Deposit Of Item

Count of Deposit Of Item

Policymaker Type
- funder
- funder_and_research_org
- multiple_research_orgs
- research_org
- research_org_subunit

required
requested
not_specified
All APCs

6,540 APCs paid since April 2013

RCUK: 2,585
COAF/WT: 1,552
UCL Gold: 2,403

Figures to end March 2016
UCL Discovery downloads

Full-text downloads to 31 March 2016

- 2016 to date: 617,917 downloads
- Lifetime downloads (from Feb 08): 9,403,622
Most-downloaded outputs Q1 2016

1. How the World Changed Social Media 6,740 2016 UCL Press
2. Marketing theories and concepts for the international construction industry: a study of their applicability at the global, national and corporate perspectives 3,161 1990 Bartlett thesis
5. Social Media in an English Village 1,883 2016 UCL Press
6. A study of the design of fluidized bed reactors for biomass gasification 1,878 1999 Chem Eng thesis
7. Why are most buildings rectangular? 1,792 2006 Article
8. Effective design, configuration, and use of digital CCTV 1,735 2009 Comp Sci thesis
Contents

The pick of the bunch

- Research Data management

Lincoln Cathedral: The Bishop’s Eye
Council’s Statements on Research Data

(14) Encourages stakeholders to set optimal reuse of data as the starting point – ‘as open as possible, as closed as necessary’

(15) Commission to promote data stewardship – including training activities and awareness raising; and calls for the implementation of Data Management Plans

(16) Data should be FAIR (Findable, Accessible, Inter-operable, Re-usable)

(17) Endorses the creation of a European Open Science Cloud
LERU Roadmap for Research Data

- Overseen by Research Data Working Group

- Pablo Achard (University of Geneva)
- Paul Ayris (UCL, University College London)
- Serge Fdida (UPMC, Paris)
- Stefan Gradmann (University of Leuven)
- Wolfram Horstmann (University of Oxford)
- Ignasi Labastida (University of Barcelona)
- Liz Lyon (University of Bath)
- Katrien Maes (LERU)
- Susan Reilly (LIBER)
- Anja Smit (University of Utrecht)
<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy and Leadership</td>
<td>Identifies how policy development and leadership are undertaken</td>
</tr>
<tr>
<td>Advocacy</td>
<td>Who undertakes advocacy and what is the message?</td>
</tr>
<tr>
<td>Selection, Collection, Curation, Description, Citation, Legal Issues</td>
<td>Technical Issues around collection and curation</td>
</tr>
<tr>
<td>Research Data Infrastructure</td>
<td>Where is it stored and by whom?</td>
</tr>
<tr>
<td>Costs</td>
<td>How much does it cost?</td>
</tr>
<tr>
<td>Roles, Responsibilities, Skills</td>
<td>What skills are required by which communities?</td>
</tr>
<tr>
<td>Recommendations to different stakeholder groups</td>
<td>Who does what?</td>
</tr>
</tbody>
</table>

Key Messages

- Each LERU university needs a Research Data Management Strategy
- Researchers should have Research Data Management Plans
- LERU universities need to bring stakeholders together
- Benefits of ‘open data’ for sharing and re-use should be advocated and explored
Open Data

- Open Data allows research data to be shared and re-used
  - Avoids costly duplication of research activity
  - Provides greater transparency in research activity
  - Potential to speed discovery of solutions to societal Grand Challenges, such as health care & environmental science

- Can all research data be open?
- Certain categories probably cannot
  - National security
  - Data protection
  - Commercial Funder requirements

LEARN – LEaders Activating Research Networks

- Purpose is to develop the LERU Roadmap for Research Data to build a global co-ordinated global e-infrastructure

- Outputs
  - Model Research Data Management policy
  - Toolkit to support implementation
  - Executive Briefing in five core languages so as to ensure wide outreach

Horizon 2020
Call: H2020-INFRASUPP-2014-2
Topic: INFRASUPP-7-2014
Type of action: CSA
Proposal number: 654139
Proposal acronym: LEARN
LEARN

- 5 partners
  - UCL (University College London) – lead partner
  - University of Barcelona
  - University of Vienna
  - LIBER
  - ECLAC – UN Commission for Latin America and the Caribbean
- Starts in June 2015; runs for 24 months
- €497,000 budget
  - 100% funded

Wilkins Building, UCL, 1826
LEARN Deliverables

- Model Research Data Management Policy
  - Fed by a study of RDM policies and input from Workshop attenders
- Toolkit to support implementation
  - Issues identified in Workshops and in literature
  - Surveys and self assessment tools
- Executive Briefing (in several languages)
European Open Science Cloud


- Issues considered:
  - Infrastructures
  - Skills development
  - Reward and Recognition
  - Roles and responsibilities
  - Governance & Standards
  - Funding opportunities

King’s Cross Station, London
European Open Science Cloud will…

- Encourage Innovation
- Support transition to Open Science
- Enable re-use of resources and services across boundaries
- Be a Commons based on scientific data
- A federated environment for sharing and re-use
- Based on current provision
- Light touch governance
- Globally interoperable
- Include personal training and development
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Il Duomo, Milan: West Front
Conclusions

- RDM has many stakeholders
- Data-driven research changing the way research is undertaken
- LEARN will provide
  - Model RDM policy
  - Exemplar case studies
  - Executive Briefings
- Need to embed change of research culture in universities
- Happy to hear questions