The European Open Science Cloud as an enabler for data driven science

United Nations/Italy Workshop on the Open Universe Initiative
Monday 20th November 2017
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The industrial revolution of our time is digital. We need the right scale for technologies such as cloud computing, data-driven science and the internet of things to reach their full potential. The EU has this scale.

European Cloud Initiative will unlock the value of big data by providing world-class supercomputing capability, high-speed connectivity and leading-edge data and software services for science, industry and the public sector.

The European Open Science Cloud will make science more open, efficient and productive.
COM 2016/178 - European Cloud Initiative (19 April 2016)

1. European Open Science Cloud (EOSC)
   - Integration and consolidation of e-infrastructures
   - Federation of existing research infrastructures and scientific clouds
   - Development of cloud-based services for Open Science
   - Connection of ESFRIs to the EOSC

2. European Data Infrastructure (EDI)
   - Development and deployment of large-scale European HPC, data and network infrastructure

3. Widening access and building trust
1. Still a lack of widespread **awareness** of the value of data and of **incentives** for data sharing.

2. Lack of common standards to ensure **inter-operability** of data.

3. **Not enough hardware capacity** for scientific computing, storage, connectivity.

4. **Fragmentation and lack of coordination** over different scientific communities and countries.

5. Need to translate recent **changes in privacy, data protection and copyright rules** to the research data domain.
The cloud will federate existing and emerging horizontal and thematic data infrastructures, effectively bridging today's fragmentation and ad-hoc solutions.

It will provide 1.7m EU researchers an environment with free, open services for data storage, management, analysis and re-use across disciplines.

It will add value (scale, data-driven science, inter-disciplinarity, data to knowledge to innovation) and leverage current and past infrastructure investment (10b per year by MS, two decades EU investment).
1. Governance
Develop roadmap for governance and financing
Create a global level playing field for research data sharing
Widen user-base to public services, Industry and EU

2. Content (open data)
Make Open research data default in H2020
Foster scientific data sharing in MS

3. (Open data) Infrastructure
Action Plan for scientific data Interoperability (e.g. FAIR)
Connect key EU RI (e.g. ESFRIs)
Consolidate / federate data-infrastructures

Key Commitments in the COM
EOSC Summit: figures

- 110 key stakeholders
- 80 from all categories of scientific fields
- 15 national scientific infrastructures
- 13 research funders
- 19 officials from Member States and Associated Countries
- Overall, 23 Member States and Associated Countries represented
- 1800 via web stream and extensive coverage via Twitter
Ground European science in a **common culture of data stewardship & sharing** throughout research data lifecycle. Only a **considerable cultural change** will enable long-term reuse of research data.

Develop the **EOSC as a commons** of research data, knowledge and infrastructure with different roles and responsibilities by actors at EU and MS level.

**Stimulate compliance through incentives and rewards**

**Data management plans** need to be made simple but mandatory.
EOSC Summit Highlights

Make **FAIR principles pragmatic and technology-neutral**, equally encompassing all four dimensions: findability, accessibility, interoperability and reusability

Apply **FAIR principles to all digital research objects**, incl. data-related algorithms, tools, workflows, protocols & services

Disciplines must develop their notion of FAIR in a coordinated fashion. **Standards are fundamental** but a one-size-fits-all approach must be avoided
Build **trust between all stakeholders**, e.g. scientific communities, e-infrastructures, research infrastructures, funders - “look outside the organisational boxes and work together”

Set out both **the science case and the financial case** to raise commitments for the EOSC, in particular of MS – “whatever we do needs to be integrated with the national systems”

Develop a **formal framework for governing the EOSC** (process vs. project) to sustain and strengthen related policies & programmes and secure commitment of funders and users - “what needs to be governed and how?”
EOSC – the way forward

**EOSC Declaration (Sept 2017)**
- Key input for the Roadmap
- Basis for follow-up discussion with MS (ERAC SWG 5+)
- Formally endorsed by more than 50 organisations so far

**EOSC Roadmap (Dec 2017)**
- Governance structure, incl. mandate & selection procedure for Gov. Board
- Broad (federated) architecture, incl. EOSC core services
- Financing

**EOSC Horizon 2020 Support (Jan 2018-)**
- ~260 to 300 mEuro until 2020 - INFRAEOSC
- Supporting service, governance and coordination

**EOSC Stakeholders Forum (Nov 2017)**
- Open to ALL categories at Summit
- Initially based on EOSCpilot project (Stakeholder Engagement Event 28-29 Nov)
EC gathering endorsement and commitments on the EOSC declaration

- Action list/commitment its evolutive part
- Roadmap will follow (and will have future updates)

By endorsing the principles of the EOSC Declaration, stakeholders signal their intention to be involved in the making of the EOSC (eg. by taking specific action, by joining the Executive Board, by providing inputs via the annual stakeholder forum, or again by joining consortia, to implement the EOSC via Horizon 2020).

Objectives:

- Identifying ‘doers’ out of wide range of stakeholders
- Promote accountability
EOSC Declaration

- 33 high level statements meant to capture our common understanding on the required
  - Data culture & FAIR data,
  - Research data services & architecture,
  - Governance and funding
- Sent to Summit participants for agreement (stakeholders) and discussion (EU Member States’ + Associated Countries’ representatives)
- Endorsed by more than 50 stakeholders organisations so far
Annex 4
G7 EXPERT GROUP ON OPEN SCIENCE

Executive Summary

28th September 2017

The G7 Open Science Working group (OS WG) recognizes that an international approach for some actions can help the speed and coherence of the transition towards Open Science. Overall, the G7 Open Science Working Group recommends that each G7 nation convene and engage with relevant stakeholders who can support moves towards incentivizing the increased adoption of Open Science in their national context.

Alongside these efforts, it would be useful for G7 nations to continue sharing their perspectives and progress on developing policies and fostering adoption of Open Science principles and practices, and working together to find common areas of action to support more effective implementation of Open Science practices. The OS WG focused its efforts on developing recommendations for two important aspects of Open Science: Incentives and Infrastructure, as described below.
**EOSC Roadmap**

**Governance** – (3-layered structure, mandates, working procedures)
- Member States and EC (strategic)
- Executive Board (operational)
- Stakeholders Forum and related Working Group (advisory)

**Architecture** – launching EOSC stage 1 by 2020
- Supporting EOSC components (geographical & thematic)
- Core data & services through an EOSC Hub
- Advanced services by certified actors
- Catalogues of data & Catalogues of services
- Rules of participation
- EOSC Portal as a universal entry point
- FAIR data / FAIR Action Plan

**Financing** – stage 1 / stage 2
- H2020 – RI, in particular through WP2018-20
- Developing an EOSC Business Model for long-term sustainability
EOSC implementation process

- ECI / EOSC COM
- EOSC Summit
- EOSC Stakeholder Forum (‘Coalition of doers’)
- EOSCPilot
- EOSC Roadmap (including governance board)
- ERAC SWG OSI
- ERAC RWP
- Council Conclusions
- Horizon 2020 INFRAEOSC Call WP 2018-20

Events:
- 3 stakeholder workshops
- HLEG EOSC OSPP
- >15 events

Roles:
- ECI / EOSC COM
- ERAC SWG OSI
- ERAC RWP
- Council Conclusions

Outcomes:
- EOSC Stakeholder Forum
- EOSC Roadmap
- Council Conclusions

Support Areas:
- EOSC Coord. Structure
- FAIR support
- Support to MS activities
- EOSC Hub
- EOSC Portal
- Connecting ESFRIs

2017

2018

2019-2020
WP 2018-2020: Call INFRAEOSC

Topic 1: Access to commercial services through the EOSC hub (2018)

Topic 2: Prototyping new services (2019)

Topic 3: Integration & consolidation of pan-European access mechanisms to public e-infrastructures & commercial services through the EOSC hub (2020)

Topic 4: Connecting ESFRI RI through Cluster projects (2018)

Topic 5: Support to the EOSC governance (2018-2019)

Topic 6: Enhancing the EOSC portal and connecting thematic clouds (2019-2020)
Mapping of 2018-2019 actions
Relevant EU funded projects on space data

EURO VO

HELIO
Heliophysics Integrated Observatory

VAMDC
Virtual Atomic and Molecular Data Centre

CIRCE
Cooperative ISS Research data Conservation and Exploitation

Asterics
Astronomy ESFRI and Research Infrastructure Cluster

NEXT GEOSS
Contributing to the Vision of GEO

ESA SSEP Use Case

HELIx NOBULA
THE SCIENCE CLOUD
Questions?

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