



Driving the paradigm shift towards Open Science

STM webinar

May 19th, 2020

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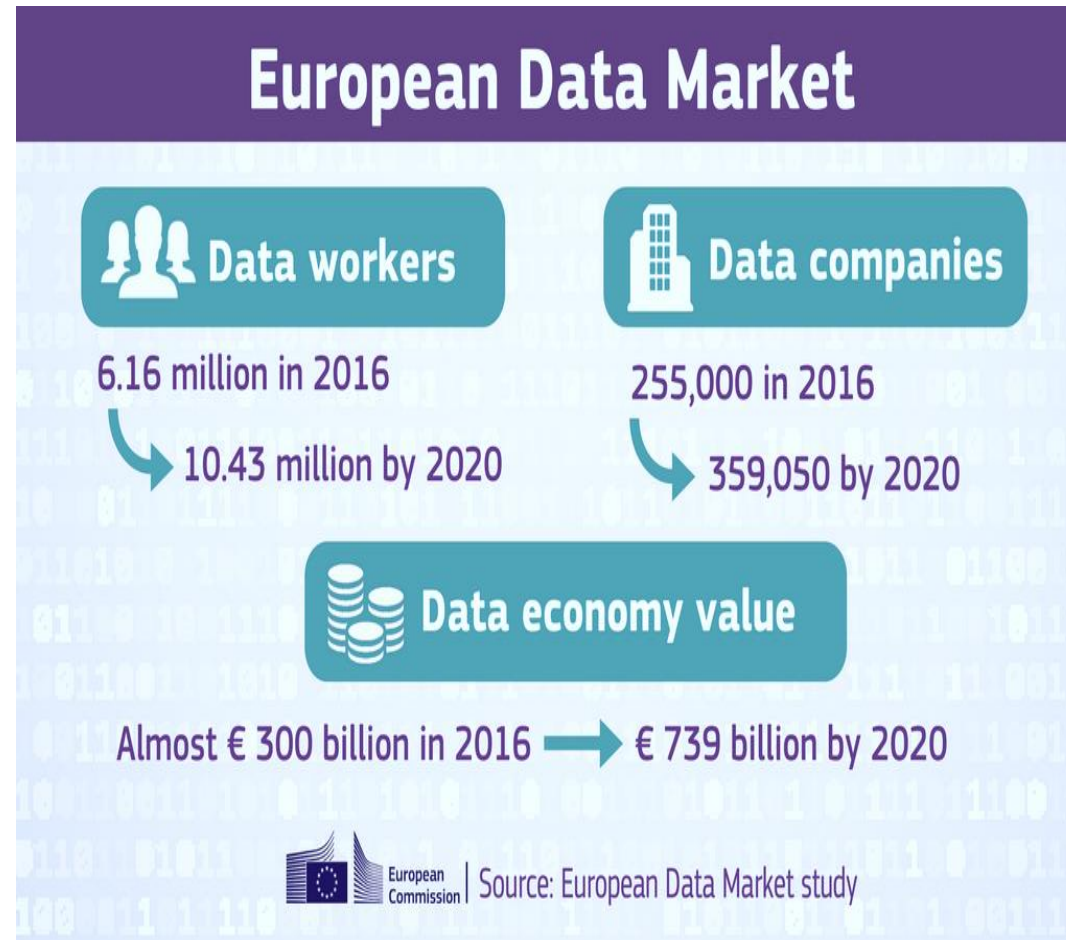
European Commission

Directorate-General for Research and Innovation

Open Science unit

Data

- Data is the **main asset** of the digital economy
- Data production continues to **grow exponentially** → from 33 zettabytes in 2018 to 175 zettabytes in 2025

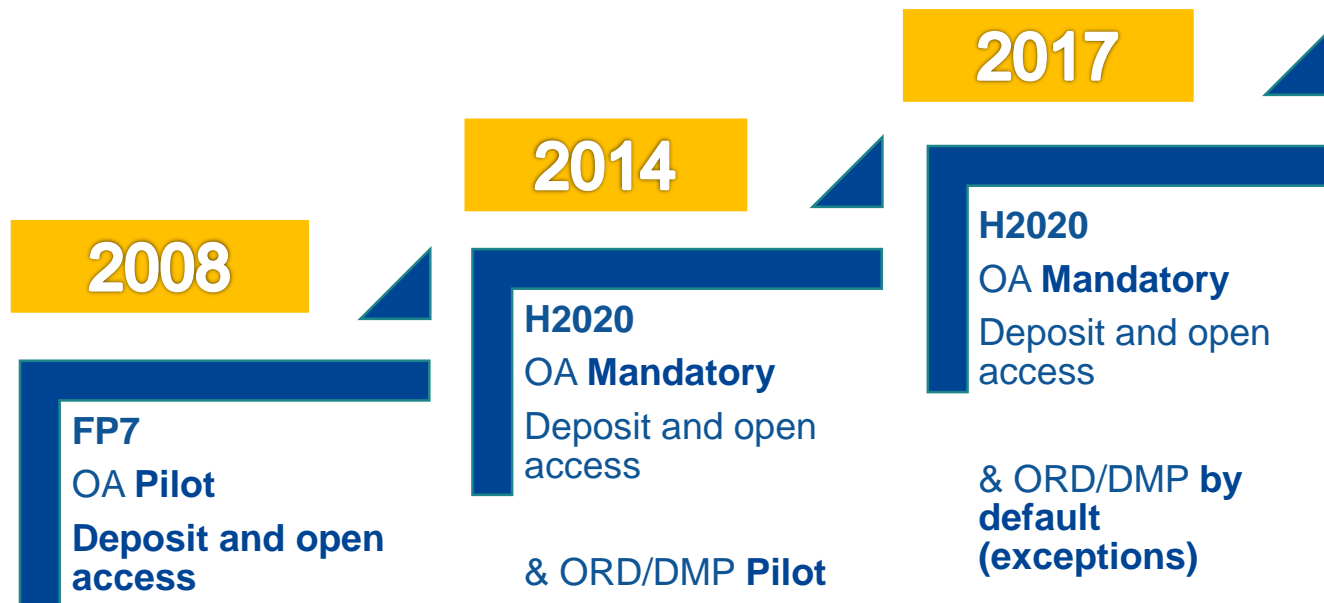


- Poor data management incurs an **opportunity cost** in the billions of euros
- **Research/Science** is one of the main data producing/consuming domains

Open Science

- **Open Science** means **sharing knowledge and tools as early as possible**, not only **between researchers** and **between disciplines**, but also with **society at large**
- Open Science improves the **quality, efficiency** and **creativity** of research and the **trust by society in science**. In particular, OS is beneficial for science, scientists and funders, e.g.:
 - tackles the reproducibility crisis;
 - faster response to societal challenges e.g. Coronavirus, Ebola;
 - access to and sharing results yields higher impact through collaborations;
 - generates new research findings;
 - large opportunity costs of non-FAIR data—**€10.2bn/year** (source: Cost-benefit analysis of FAIR research data, 2017).
- For the policy to be successful, we must develop **proper enablers** (infrastructures, rewards & incentives, skills & training, etc.)
- The Commission acts as policy maker (propose legislation and encourage MS), a funder (we set requirements to our projects) and a capacity builder (we fund ‘enabling’ projects)

Evolution of our policies across the FPs



We are pioneers!

Planned under **Horizon Europe (2021)**:

- Open Science (OA, RDM, Cit. Eng., etc.) embedded throughout the FP. OS to play a role in the:
 - **Evaluation** of proposals (methodology)
 - **Grant Agreement**
 - **Reporting**—during the project's lifetime
- Strengthening of the obligations with respect to open access and focus on responsible RDM

Research data under Horizon Europe

- The governing principle will be to manage research data **responsibly, in line with FAIR**, and for data to be “**as open as possible and as closed as necessary**”. To accomplish this, we are **likely** to see the following:
 - At proposal stage, beneficiaries will be **evaluated** on **preliminary RDM considerations**
 - All projects that **generate/collect/re-use** research data will have to establish and regularly update a **Data Management Plan** (living document and machine-actionable)
 - Beneficiaries will have to **deposit data in a repository** and link their data to publications they underpin, if applicable
 - Valid repositories will be those that provide **PIDs** for the data and ensure **rich metadata** in line with FAIR.
 - For some actions, an additional obligation to deposit in a repository that is federated under EOSC
 - Beneficiaries to ensure **open access ASAP** under CC BY or CC0 licences (or equivalent), unless exceptions apply (duly justified in the DMP)

Other research outputs under Horizon Europe

- Data is not the only research output that should be managed → **digital**: Software, algorithms, protocols, workflows, models, and **physical**: reagents, antibodies, hardware, etc. all need to be appropriately managed:
 - We would like to see other research outputs also **described in the DMP**
 - There will be a **strong encouragement** for beneficiaries to **deposit and provide open access via a repository** to these outputs, unless legitimate interests or constraints apply
- So, what if OA is not provided to a dataset or a research output, and access is needed to validate the conclusions of a scientific publication?
 - Beneficiaries will have to provide the access needed for validation purposes, to the extent that their legitimate interests or constraints are safeguarded

European data strategy

- Published in February 2020, it highlights the importance of **data** in the digital economy
- It sets out policies and measures for a **single market for data**
- Important pillar: **Data Spaces** in strategic sectors (pools of data supported by infrastructure and governance mechanisms to foster sharing)

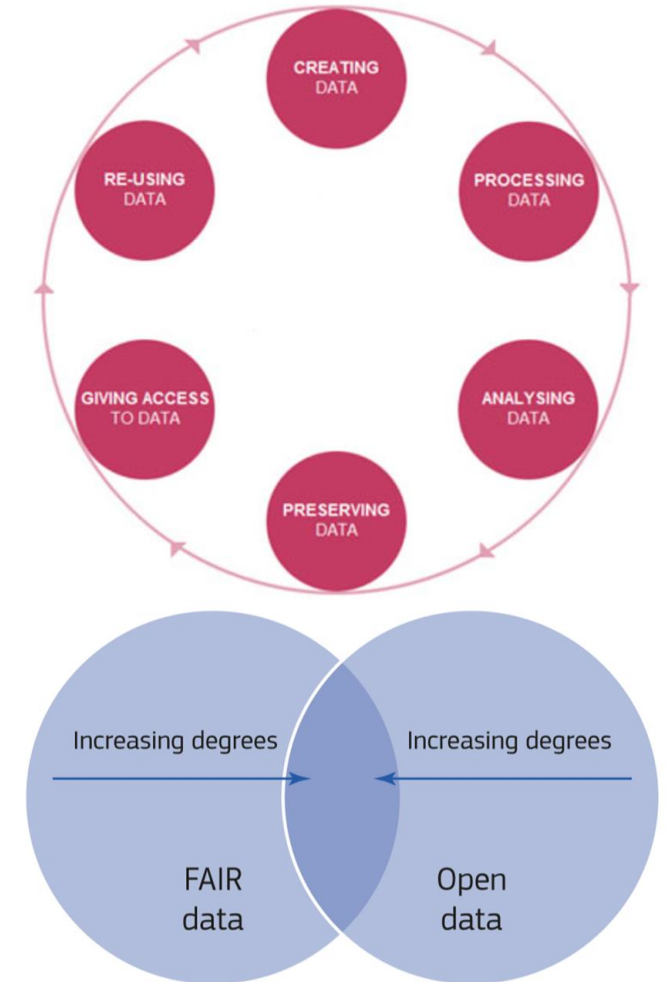


- 9 Data Spaces
 - Industry
 - Green Deal
 - Mobility
 - Health
 - Finances
 - Energy
 - Agriculture
 - Public administration
 - Skills
- 10th Data Space: **Science, Research & Innovation** (transversal across **all** Data Spaces)

European Open Science Cloud



- The European Open Science Cloud (EOSC) ([European Cloud Initiative Communication, 2016](#)) will federate existing and emerging infrastructures to offer a **trusted** and **open distributed** system for the scientific community, providing **seamless access to data** and **interoperable services** addressing the **whole research data lifecycle**
- EOSC will enhance the possibilities for researchers to find and share publications, data and software leading to **new insights** and **innovations**, higher researcher **productivity** and **solutions** for society
- EOSC engages all relevant stakeholders to co-design and deploy a Web of FAIR data and related services for Science



President U. von der Leyen

World Economic Forum, Davos, Jan. 22nd, 2020

EOSC has become a **presidential priority!**

- “We are creating a **European Open Science Cloud** now”
- “It is a **trusted space** for researchers to **store** their data and to **access** data from researchers from **all other disciplines**”
- “We will create a **pool of interlinked information, a web of research data**”



FAIR and data sharing against the Sars-CoV-2

- The European Commission has rapidly responded to the current **pandemic**:
 - The Commission presented on April 7 its [ERAvsCORONA action plan](#) (approved by the R&I ministers of all Member States) containing **10 key areas for coordinated R&I actions**
 - **One priority**, consisted in setting up a research data sharing platform, as a real implementation case of EOSC, with the objective of **speeding up** and improving the **sharing, re-use, processing of**, and **access to research data and metadata** on the SARS-CoV-2 and the related COVID-19 disease
 - The Commission called on active EOSC stakeholders like EMBL-EBI, ELIXIR, and other partners to create this **open, trusted, scalable** pan-European environment addressing different types of relevant data
 - All data and metadata on this platform will be as **open** and as **FAIR** as possible




President U. von der Leyen

20 April 2020, launch of the European COVID-19 Platform

The platform is a thematic priority pilot to realise the EOSC vision and to showcase the added value of FAIR data sharing to advance science and benefit researchers

- “The platform is an **important part** in the **building of the European Open Science Cloud**”

 **COVID-19** *Data Portal*

Press release: https://ec.europa.eu/commission/presscorner/detail/en/ip_20_680

Video: <https://audiovisual.ec.europa.eu/en/topnews/M-004711>

European COVID-19 Research Data Platform: <https://www.covid19dataportal.org/>

FAIR and data sharing against the Sars-CoV-2

- In addition to the platform, the Commission promotes FAIR and data sharing through:
 - The drafting of detailed guidelines on open access to publications and data for H2020 projects (encouraging beneficiaries to go beyond their contractual obligations)
 - The guidelines share best practices on **FAIR, open access, data management plans**, and also provide links to **standards, relevant repositories**, and an overview of **ongoing data-related efforts** under the umbrella of EOSC
 - The **Research Data Alliance (RDA)**. The RDA quickly responded to our request and set up a **COVID-19 WG** to deliver detailed guidelines on **data sharing** under a health emergency
 - **OpenAIRE**. OpenAIRE has recently launched a COVID-19 gateway to aggregate and enable discovery of relevant publications, datasets, other research outputs

Joint efforts to tackle the pandemic

- Statement on Sharing research data and findings relevant to the novel coronavirus (COVID-19) outbreak, 31 January 2020 (over 140 signatories)
- Organisations commit to work together to help ensure:
 - all peer-reviewed research publications relevant to the outbreak are made **immediately open access**, or freely available at least for the duration of the outbreak
 - research findings relevant to the outbreak are **shared immediately with the WHO** upon journal submission, by the journal and with author knowledge
 - research findings are made available via preprint servers before journal publication, or via platforms that make papers **openly accessible before peer review**, with clear statements regarding the **availability of underlying data**
 - researchers share interim and final research data relating to the outbreak, together with protocols and standards used to collect the data, **as rapidly and widely as possible** - including with public health and research communities and the WHO
 - authors are clear that data or preprints shared ahead of submission will **not pre-empt its publication** in these journals

How do we move forward together?

- Fully implementing Open Science practice requires **engagement of all stakeholders**
 - Researchers, research performing organisations, funders, policy makers, publishers, citizens, etc.
 - At all levels (regional, national, European and international).
- **One** policy, **three** sets of complementary actions:
 - Develop the necessary **infrastructures and services**
 - Induce and support **coordinated paradigm shifts**
 - **Walk the talk** in European R&I programmes and **lead by example**

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