



Vision of Open Science in Europe and beyond

Open Science and collections in Austria

Open Science workshop at the Natural History Museum Vienna

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Outline

- Science is in transition
- What is EOSC?
- EOSC in the European policy context
- EOSC implementation in the next ten years
- EOSC in the international context

Science is in transition

Open Science: sharing knowledge and tools as early as possible, between researchers and disciplines and also with society at large.

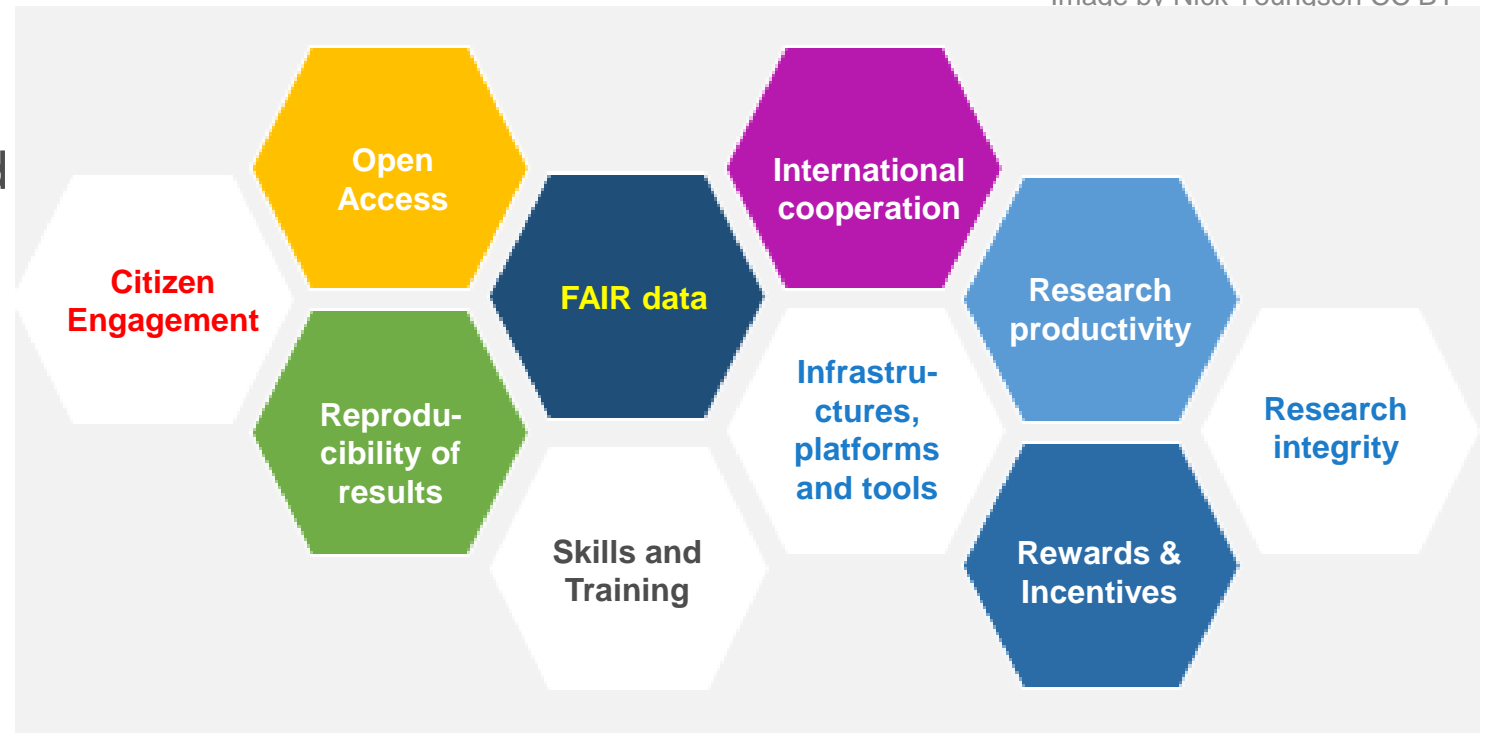


Image by Nick Younason CC BY-

Open Science Commons

The Commons are community-governed and driven by a core set of values

EOSC
European Open Science Cloud
will
Enable Open Science Commons



Main challenges and priorities for Open Science

Improve **the practice** of research and innovation

- Openly accessible scholarly publications
- Early sharing of all research outputs
- All data FAIR, RDM
- Reproducible results
- Societal engagement and responsibility

Develop proper **enablers**

- Rewards and incentives to adopt Open Science practices, with appropriate metrics
- Appropriate skills and education, including for research integrity
- Open Research Infrastructures including the European Open Science Cloud (**EOSC**)

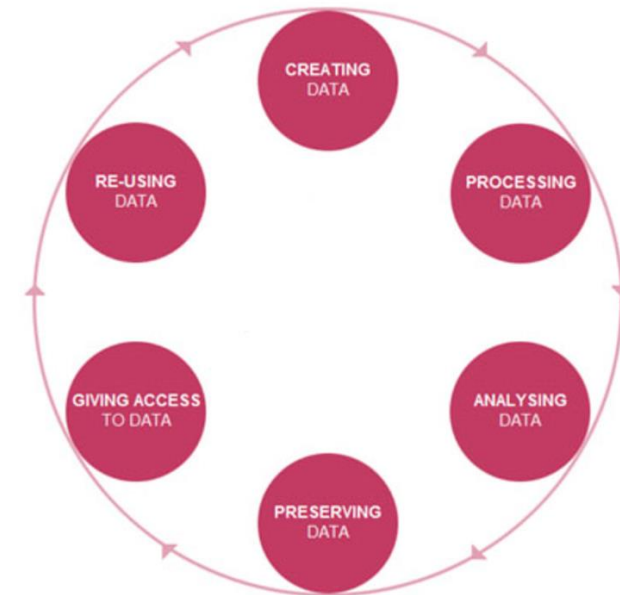
Towards a new '*modus operandi*' for Science

Current System (dominant)		Open Science	
Rewarding individual competing scientists - gaining scientific prestige		Rewarding collaboration and sharing to achieve societal impact (e.g. Covid-19)	
Publish as much and as fast as possible (<i>publish or perish!</i>)		Share knowledge/data as early and as openly as possible	
Excellence defined largely on the basis of <i>where</i> scientists publish		Composite definition of excellence	
Incentivises researchers to <i>produce specific outputs</i> (mainly publications)	Use of quantitative metrics	Incentivises researchers to share, collaborate, increase quality and impact; while considering diversity of outputs and research cultures	Use of qualitative and quantitative metrics
Increasing influence of commercial players from access to publications, to supply of data storage, search functionalities and information gathering		Avoid lock-in over public-funded R&I output, maintain a level playing field ensuring autonomy of Research Performing organisations including universities	



What is EOSC?

- Trusted, **federated** and multi-provider **environment** that cuts across borders and scientific disciplines to enable **Open Science** and **FAIR data management** practices.
- Brings together institutional, national and European stakeholders, initiatives and infrastructures
- Vision: a “**Web of FAIR Data and Services for Science**”.
- It will enhance the possibilities for researchers to **find, share and reuse research outputs** like publications, data, and software leading to **new insights** and innovations, higher research **productivity** and improved **reproducibility** in science.



EOSC in the European Data Strategy

(February 2020)



The EU will create a single market for data by:

- ❑ Setting clear and fair rules on access and re-use of data;
- ❑ Investing in next generation standards, tools and infrastructures to store and process data;
- ❑ Joining forces in European cloud capacity;
- ❑ **Pooling European data in key sectors, with EU-wide common and interoperable data spaces;**
- ❑ Giving users rights, tools and skills to stay in full control of their data.

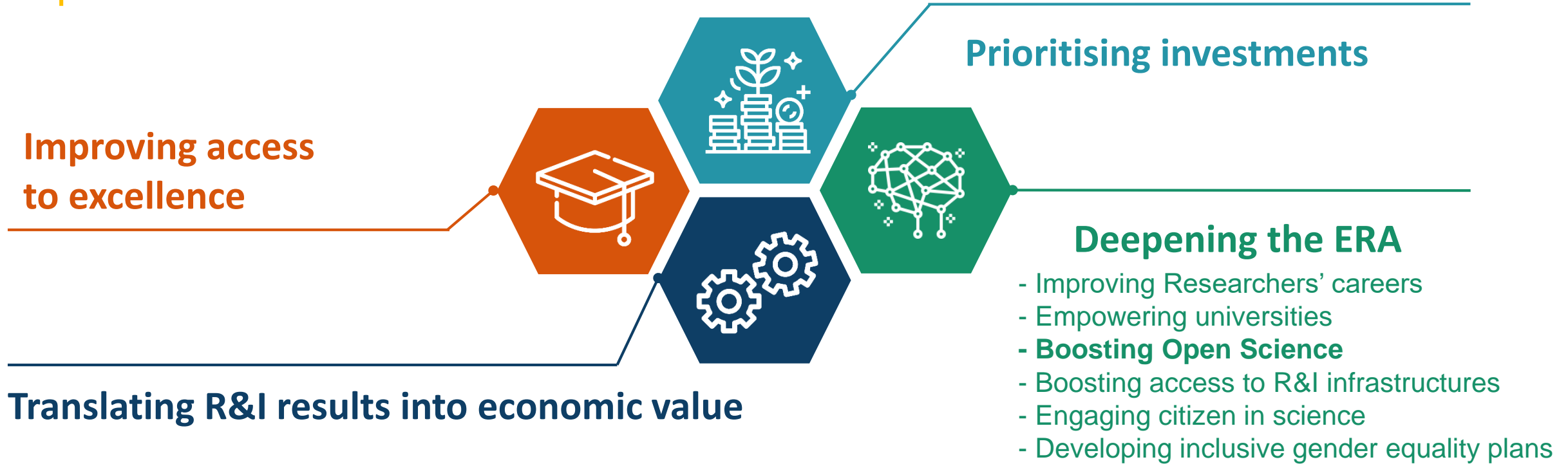
*“**EOSC** is the basis for a science, research and innovation data space that will bring together data resulting from research and deployment programmes and will be connected and fully articulated with the sectoral data spaces.”*

(European Data Strategy, COM(2020) 66 final)



EOSC in the new European Research Area

(September 2020)



Key action 9 of the ERA roadmap:

- Launch, via the Horizon Europe Programme, a platform of peer-reviewed open access publishing; analyse authors' rights to enable sharing of publicly funded peer-reviewed articles without restriction;
- **Ensure a European Open Science Cloud that is offering findable, accessible, interoperable and reusable research data and services [Web of FAIR data and services for science];**
- Incentivise open science practices by improving the research assessment system.

EOSC in the Recovery and Resilience Plans (RRP)

The Recovery and Resilience Facility

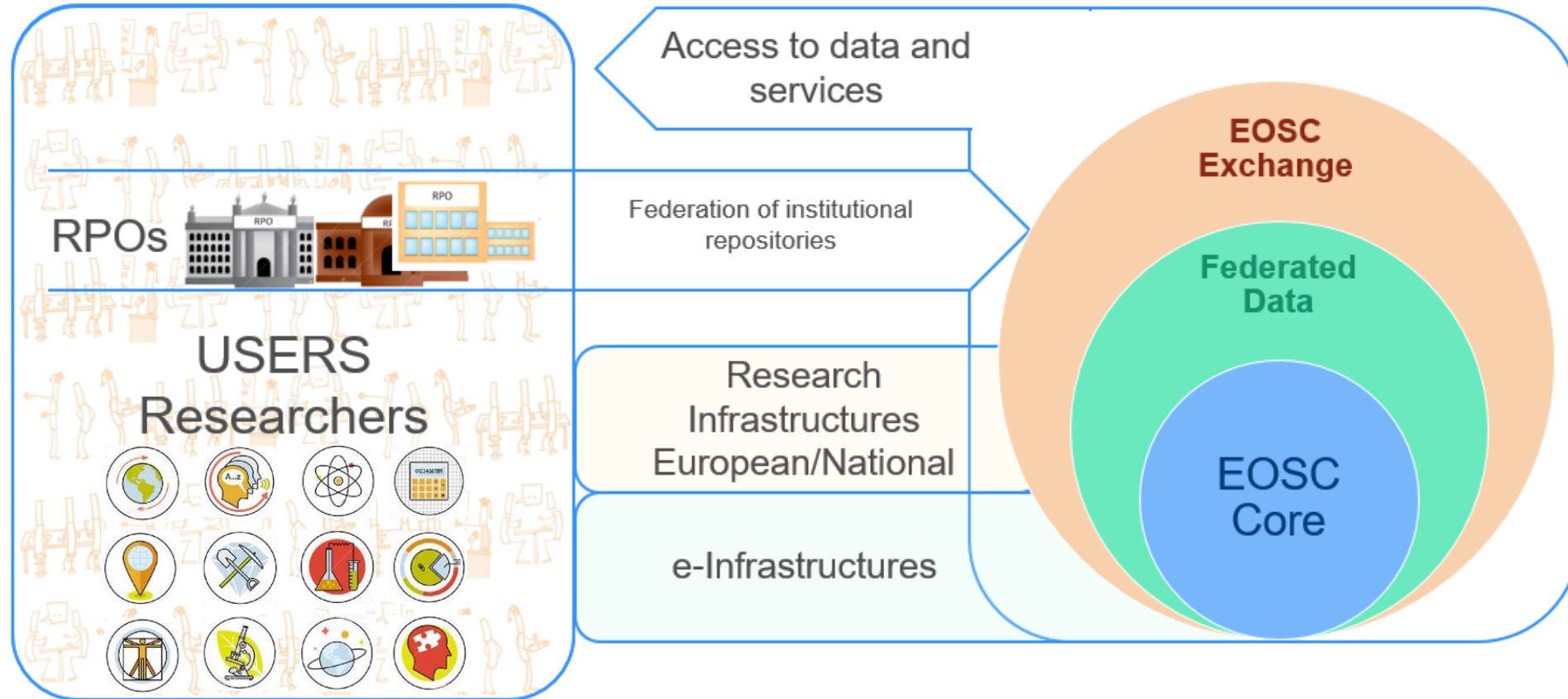
- aims to mitigate the economic and social impact of the coronavirus pandemic and make European economies and societies more sustainable, resilient and better prepared for the challenges and opportunities of the green and digital transition;
- will make €672.5 billion in loans and grants available to support reforms and investments undertaken by Member States.



Examples of reforms and investments – ‘Scale-up’ - Cloud, edge and data:

“Stimulate the emergence and deployment of the next generation of federated and competitive European cloud to edge services and platforms, leveraging existing initiatives which respond to new users’ needs in times of post-recovery (such as those in Austria, Belgium, Estonia, France, Greece, Ireland, Italy, Lithuania, Poland, Portugal, Spain and GAIA-X; **the European Open Science Cloud (EOSC) could also be leveraged where directly contributing to build the next generation of federated cloud business capabilities in the EU)**”

EOSC ecosystem



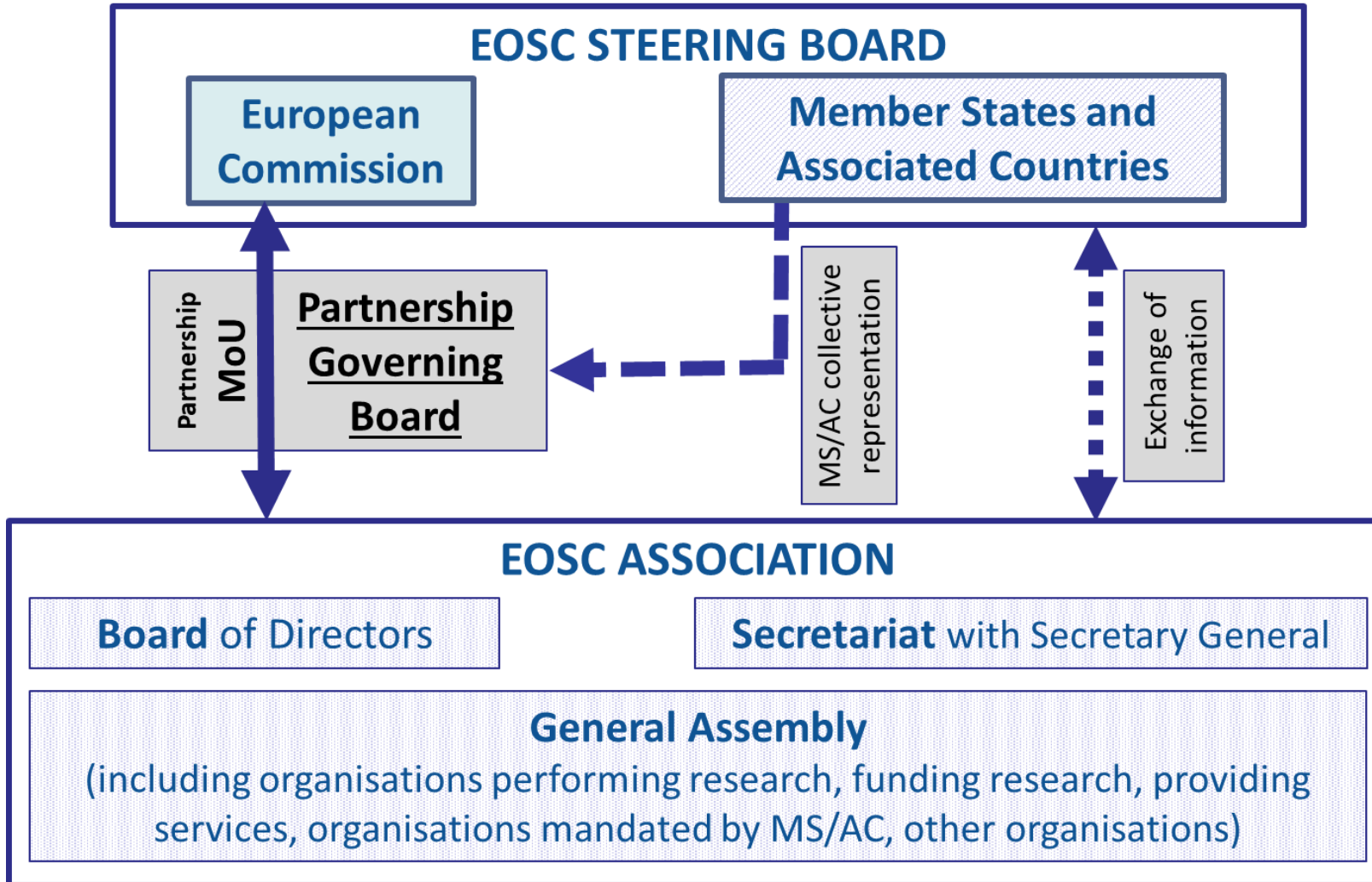
The challenge is not limited to linking datasets, federating infrastructures or aligning policies. It starts by linking people and organisations across the EOSC ecosystem.

Towards a European Partnership approach

- To ensure **directionality** (common vision and objectives)
- To agree on a common Strategic Research and Innovation Agenda (**SRIA**)
- To ensure additionality and **pool resources** at European, national, regional and institutional levels
- To provide a **focal point** for the European research community and a framework to reach consensus amongst **committed 'Doers'**



Towards a new EOSC governance



In the second phase [post-2020] the EOSC governance should become mainly stakeholder-driven, while maintaining a higher-level steering role for all Member States and the Commission.

(Council conclusions on EOSC, 19 May 2018)

The council of the Union calls on the Commission and participating States to serve in an tripartite governance and to further develop and implement the European Open Science Cloud (EOSC) [...].

(Council conclusions on the new ERA, 1 Dec. 2020)

The new EOSC Association

- Founded on 29 July 2020 as an AISBL under Belgian law
First constitutional General Assembly on 17 December 2020
- Shall represent **the broader EOSC stakeholder community**
More than 130 members and 48 observers
- Planned signature in April 2021 of a Memorandum of Understanding for the **EOSC European Partnership** with the Commission



Core functions for the EOSC Association

- ❑ Develop and govern the EOSC federating core;
- ❑ Manage the EOSC compliance framework (Rules of Participation);
- ❑ Manage trusted certification;
- ❑ Manage the EOSC AAI capacity;
- ❑ Manage / implement EOSC PID policies
- ❑ Outreach to stakeholders
- ❑ Monitor EOSC services and transactions
- ❑ Manage EOSC trademark(s)
- ❑ Contribute to Horizon Europe programme and EU policies

EOSC Strategic Research and Innovation Agenda (SRIA)

Three General Objectives

GO1. Open Science practices and skills are rewarded and taught, becoming 'the new normal'

- Scope: the EOSC ecosystem underpins the reward of OS practices

GO2. Sustainable and federated infrastructures enable open sharing of scientific results

- Scope: **EOSC-Core**, federated data infrastructures and **Marketplace**

GO3. Standards, tools and services allow researchers to find access, reuse and combine results

- Scope: Turning the FAIR principles into practice (all type of research artefacts in a digital form)

Translated into fourteen EOSC Action Areas

Implementation challenges	Boundary conditions
AA1. Identifiers	AA8. Rules of Participation
AA2. Metadata and ontologies	AA9. Landscape monitoring
AA3. FAIR metrics	AA10. Funding models
AA4. Authentication and Authorisation Infrastructures (AAI)	AA11. Skills and training
AA5. User environments	AA12. Rewards and recognition
AA6. Resource provider environments	AA13. Communication
AA7. EOSC interoperability framework	AA14. Widening to public and private sectors

Importance of international cooperation

- Science is a **global enterprise**, many R&I collaborations are **international in nature**
 - Need **access** to, and **reuse** of knowledge, data, tools and infrastructures world-wide
 - Need **sharing** and **collaboration** with teams all over the globe
- However, **policies, rules and actions** for open sharing of knowledge and data are most often set at national or institutional level
 - Need for **international standards** and **interoperability**
 - Need for **international alignment** on values and principles: **open science, reciprocity and level playing field**
- Cooperation sought **bilaterally and multilaterally**
 - G7, OECD, UNESCO, RDA, ISC/CODATA, ...

Thank you



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