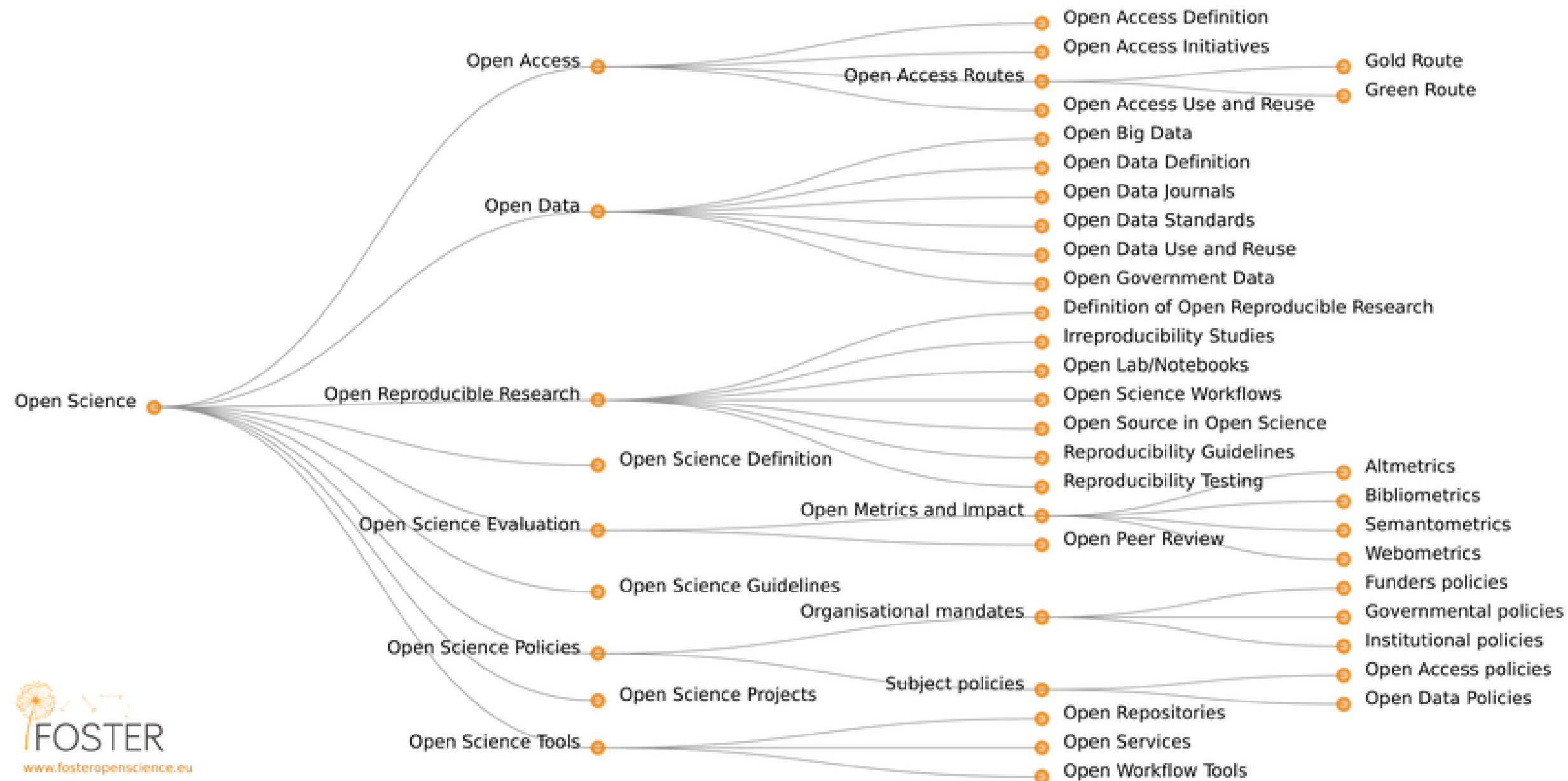# Giulia Malaguarnera

OpenAIRE Outreach and Engagement Officer
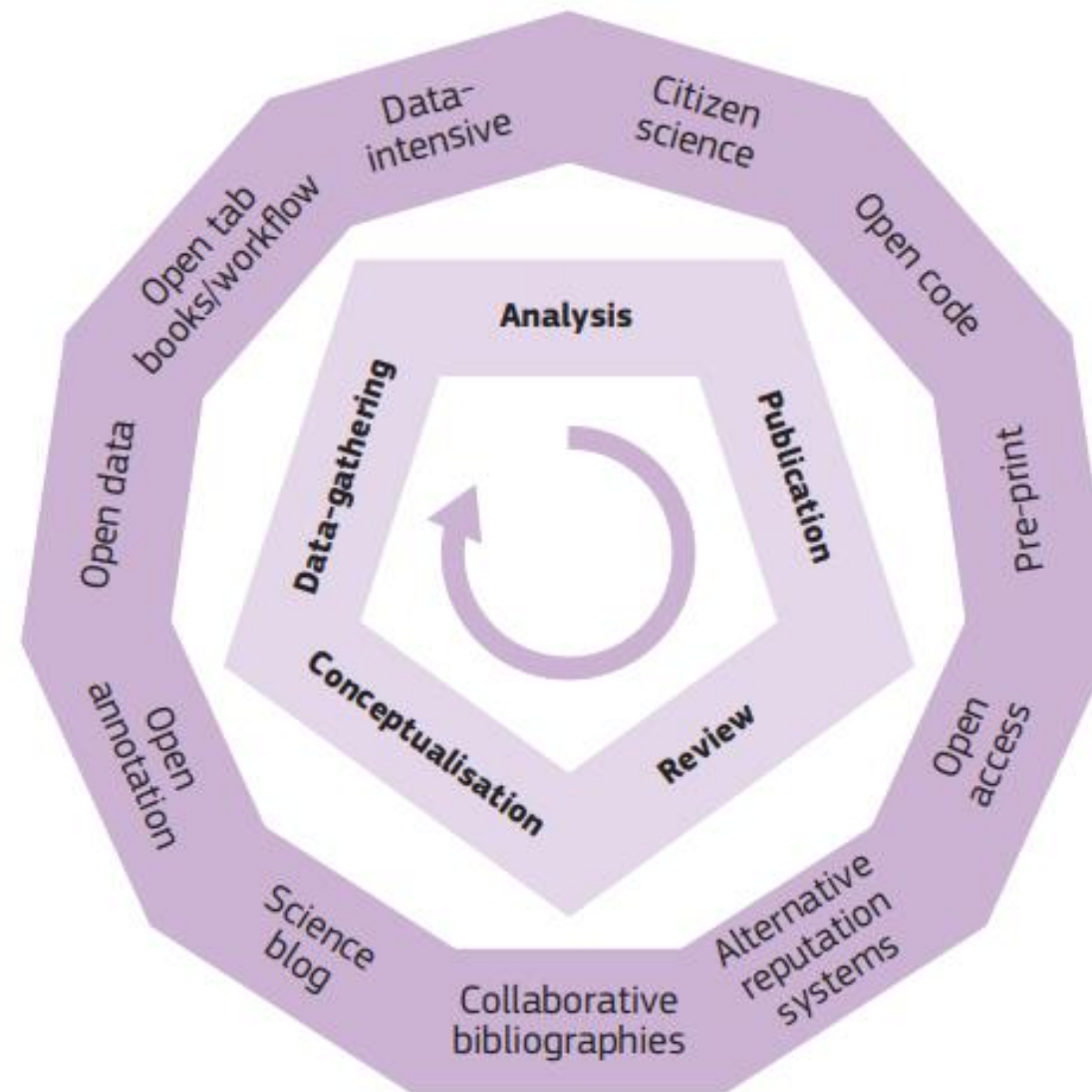
Athena Research and Innovation Center

The European e-infrastructures: The role of OpenAIRE in EOSC

OpenAIRE

European Commission

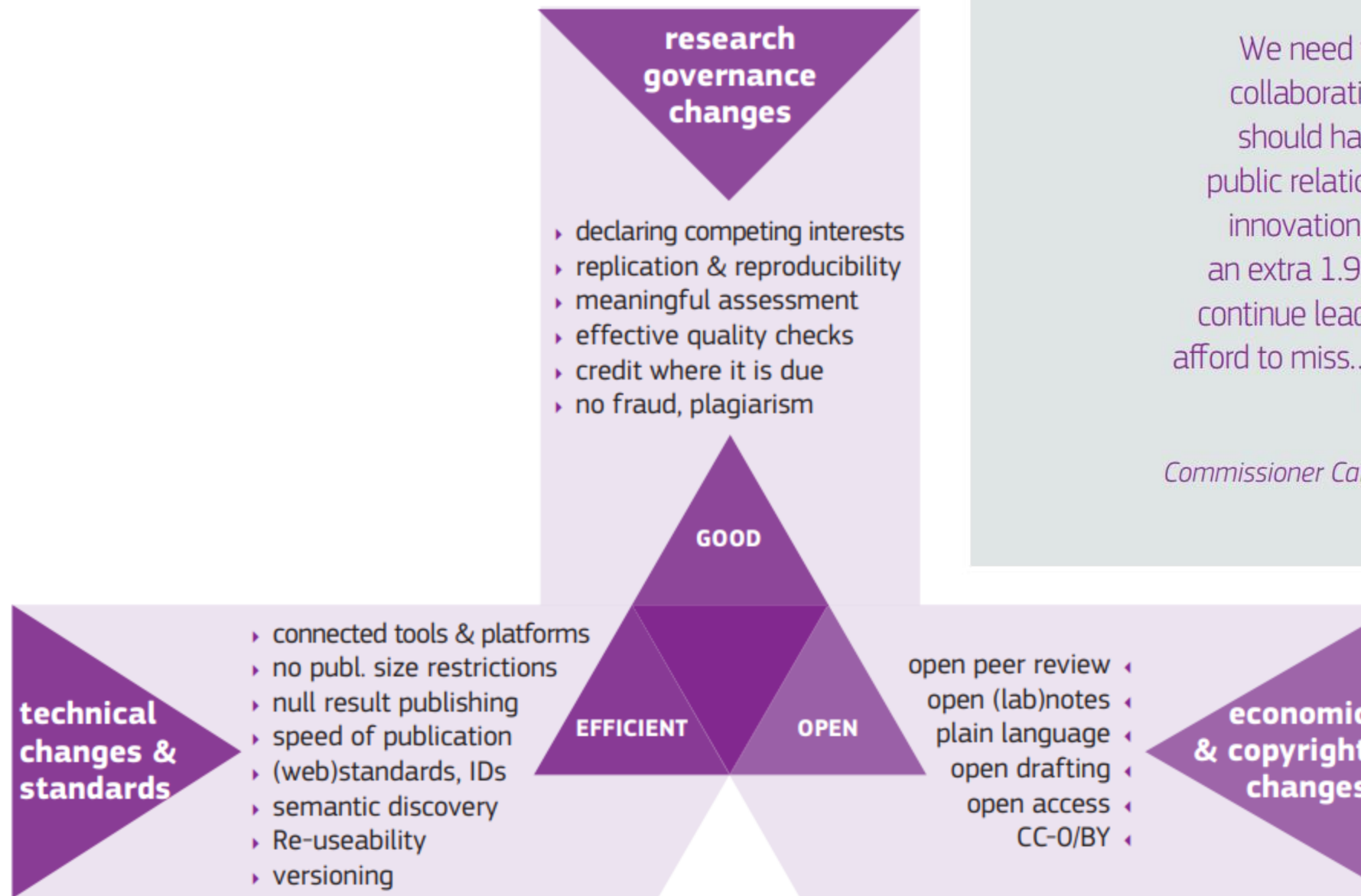The Road towards EOSC as seen from the national level | 20 October 2021

@openaire_eu

What is Open Science?

Open Science = Opening up the research process

Discovery › Analysis › Writing › Publication › Outreach › Assessment

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Towards better science

research governance changes
- declaring competing interests
- replication & reproducibility
- meaningful assessment
- effective quality checks
- credit where it is due
- no fraud, plagiarism

GOOD

technical changes & standards
- connected tools & platforms
- no publ. size restrictions
- null result publishing
- speed of publication
- (web)standards, IDs
- semantic discovery
- Re-useability
- versioning

EFFICIENT

OPEN

- open peer review
- open (lab)notes
- plain language
- open drafting
- open access
- CC-0/BY

economic & copyright changes

We need to shift our focus from publishing as soon as possible, to sharing and collaborating as soon as possible. Public investment in research and innovation should have the greatest social and economic benefits possible: improving the public relationship with our science systems and opening research results to new innovation and business opportunities. Big and open data alone could be worth an extra 1.9% to EU-28 GDP by 2020. To remain prosperous and competitive, to continue leading the forefront of learning, this is an opportunity we simply cannot afford to miss... Expensive fees for publicly funded research results that could be of benefit to citizens, must end, and new business models put in place.
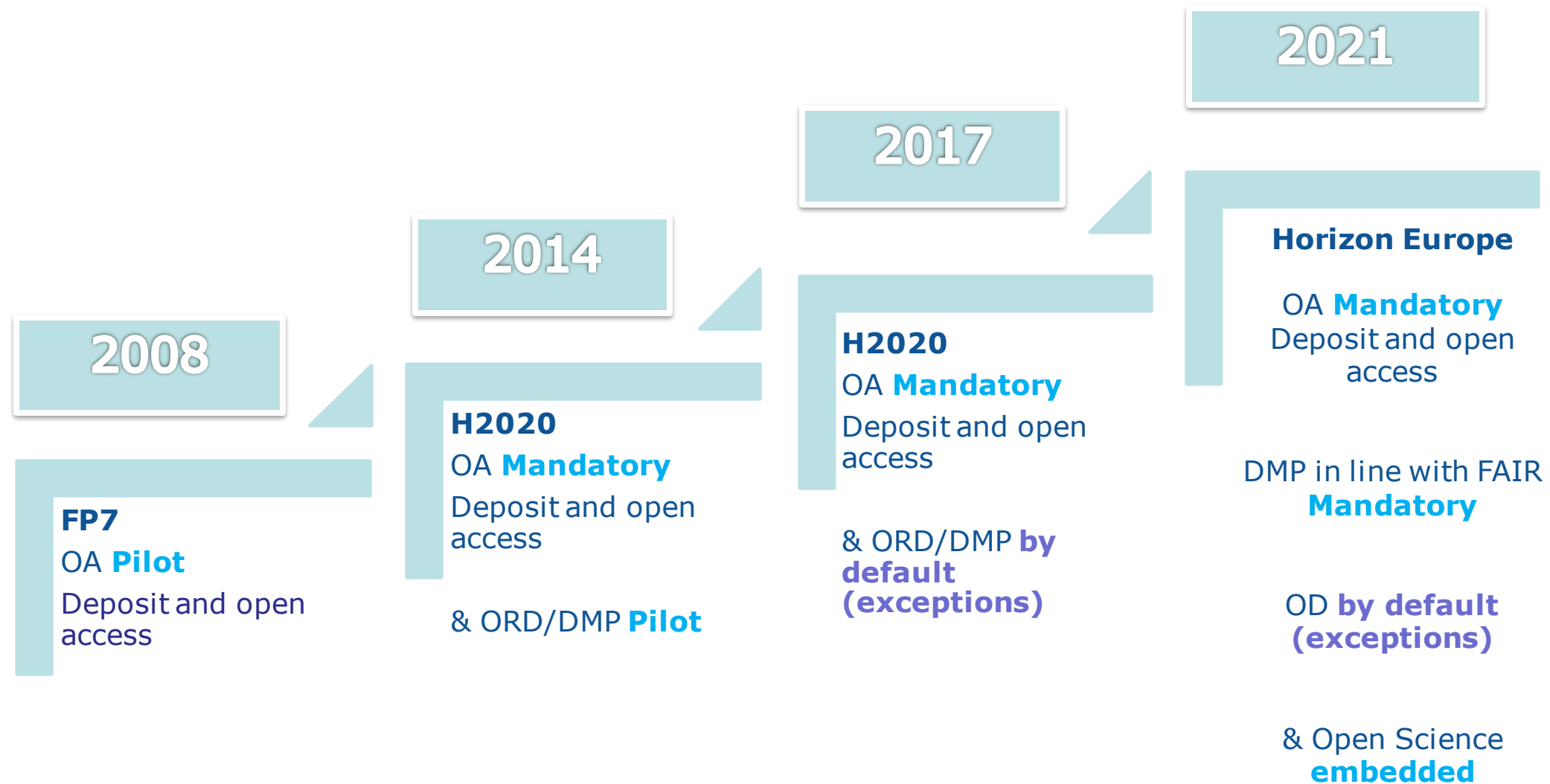
Commissioner Carlos Moedas, Freedom is absolutely necessary for scientific progress, Brussels, 26 January 2015

Open **Innovation**
Open **Science**
Open to the **World**

– a vision for Europe

Source: http://blogs.lse.ac.uk/impactofsocialsciences/2015/11/11/101-innovations-in-scholarly-communication/

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The European Commission and Open Science

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 (exceptions)**

2021

Horizon Europe

OA **Mandatory**
Deposit and open access

DMP in line with FAIR
Mandatory

OD **by default (exceptions)**

& Open Science
embedded

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From theory to practice.
EOSC and OpenAIRE

"… a virtual environment with free at the point of use, open and seamless services for storage, management, analysis, and reuse of research data, across borders and scientific disciplines

European Cloud Initiative (ECI), (COM(2016) 178final), p.6; Part of the Digital Single Market Strategy

EOSC key characteristics

- **Building on existing infrastructures**
- **User-oriented, user-driven services**
- **Co-design of the EOSC governance and funding**
- **Emphasis on**
  - Open and FAIR data
  - Social challenges (people, training)
  - Professional operation of services
  - New models of scholarly communication
  - Innovative funding mechanisms

OpenAIRE

Science. Set Free.

Our mission

Shift scholarly communication towards openness and transparency and facilitate innovative ways to communicate and monitor research.

Our vision

Transform society through validated scientific knowledge. Allow citizens, educators, funders, civil servants and industry find ways to make science useful for themselves, their working environments, the society.

What OpenAIRE does?

Align policies

Engaging all stakeholders for an effective Open Science implementation

We foster the open science dialogue for policies and their implementation in Europe and beyond. Our network of **34 National Open Access Desks (NOADs)** operates a European Helpdesk supporting a coordinated transition to Open Science.

Provide open science services

Embedding Open Science into researcher workflows

We provide **interoperability** services that connect research and enable researchers, content providers, funders and research administrators to easily adopt open science.

Link research

Building global common standards for linking research

We link research outcomes (e.g., publications, data, software) to their creators (e.g., researchers, institutions, funders), enabling **discoverability, transparency, reproducibility and quality-assurance of research**.

Monitor (open) science

Faciliating transparency in research impact assessment

We build the European Research Information system that encompasses all research and enables **ready-made reporting, monitoring and analysis**.

Train for open science

Fostering the culture change for Open Science practice

We train researchers, content providers, policy makers to acquire the skills and competencies to practice Open Science. We are reaching out to a broad and diverse user base through our **train-the-trainer programme** via our National Open Access Desks.

Build global bridges

Connecting Europe to the global open research environment

We work with similar initiatives around the world to promote and share **common access policies and protocols** for all research results. We promote **common data standards and exchange content** to transitiion towards an effective and open global research ecosystem.

Facilitate Open Innovation

Facilitating innovation for scholarly communication, opening new horizons for research

We make all research information freely available so that 3rd party providers build **value added services** to foster better understanding of scientific knowledge, while we scout for **open and innovative scholarly communication services**.

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Supporting Open Science scholarly communication workflows

European (and beyond) infrastructure
for Open Access and Open Science

Networking infrastructure: Open Access/Science advocacy and support, interoperability, global alignment on Open Science, National Open Access Desks, FAIRness of research data, citizen science, etc.

Technical infrastructure: services for, e.g., monitoring of Open Access/Science and Research Impact for funders and research infrastructures

CONNECT   PROVIDE   EXPLORE

DEVELOP   MONITOR

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What OpenAIRE offers in EOSC marketplace?

- **Training Catalogue**

- **Services Catalogue**
  - OpenAIRE Nexus

- **OpenAIRE/EOSC Research Graphs**
  - Providing an open metadata research graph of interlinked scientific products, with Open Access information

OpenAIRE Nexus
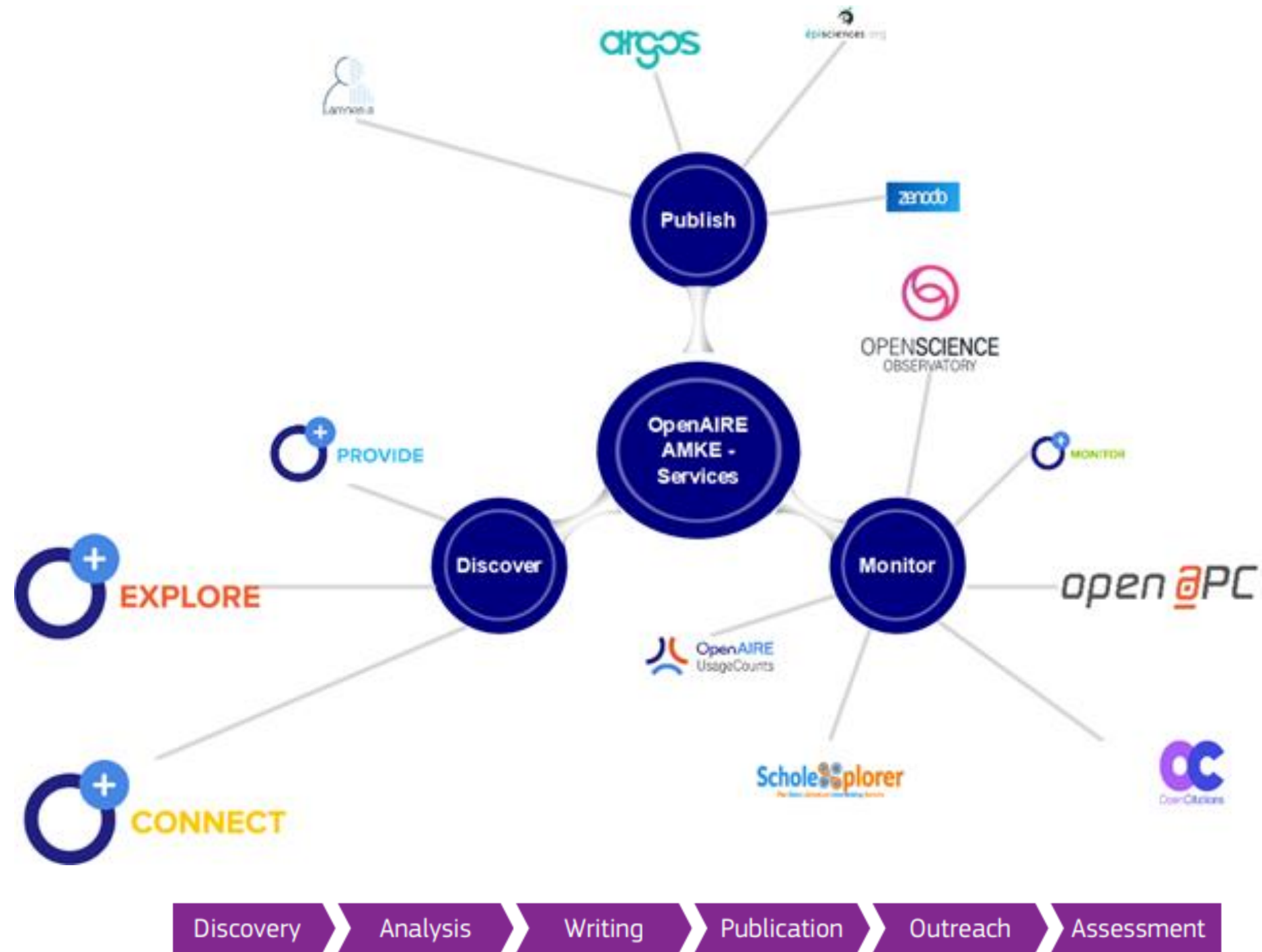
OpenAIRE e-infrastructure

Materializing the Open Science graph

- Harvested data sources
  - 10K +

- Harvested records
  - 500Mi +

- Publication full-texts
  - 10Mi +

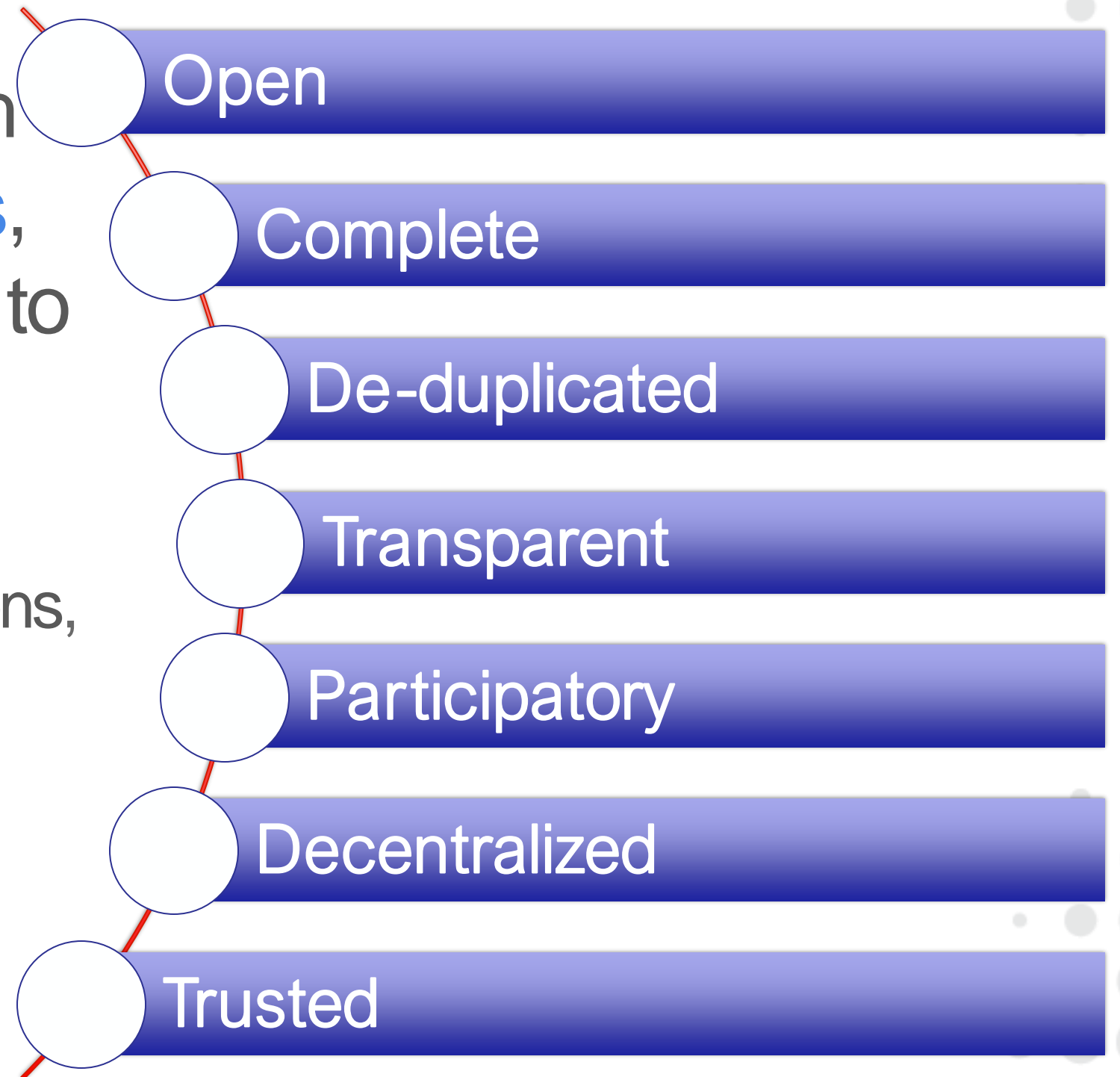- Harvested/mined links
  - 60Mi +

CONNECT PROVIDE EXPLORE

DEVELOP MONITOR
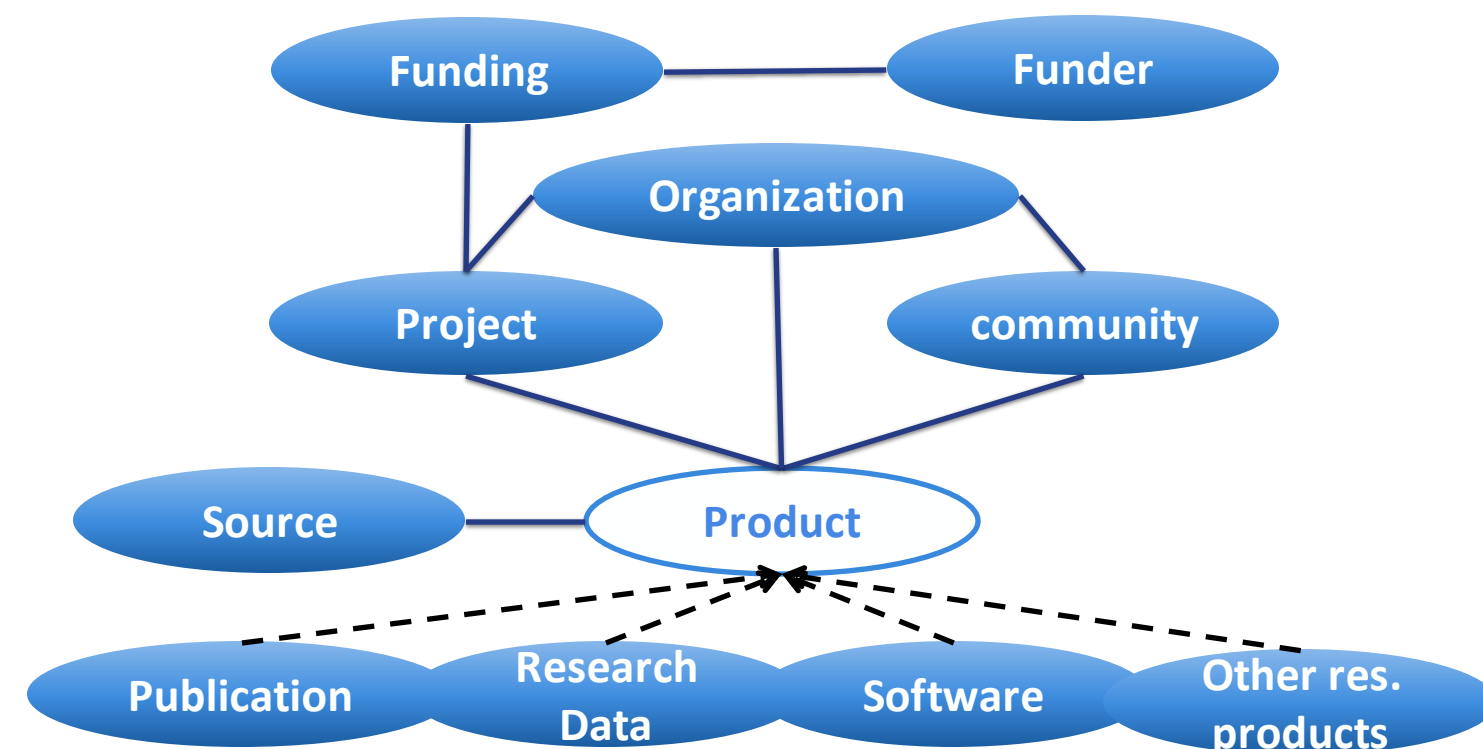
The OpenAIRE research graph

Providing an open metadata research graph of interlinked scientific products, with Open Access information, linked to funding information and research communities

- Monitoring and assessment by organizations, funders, research infrastructures, and researchers
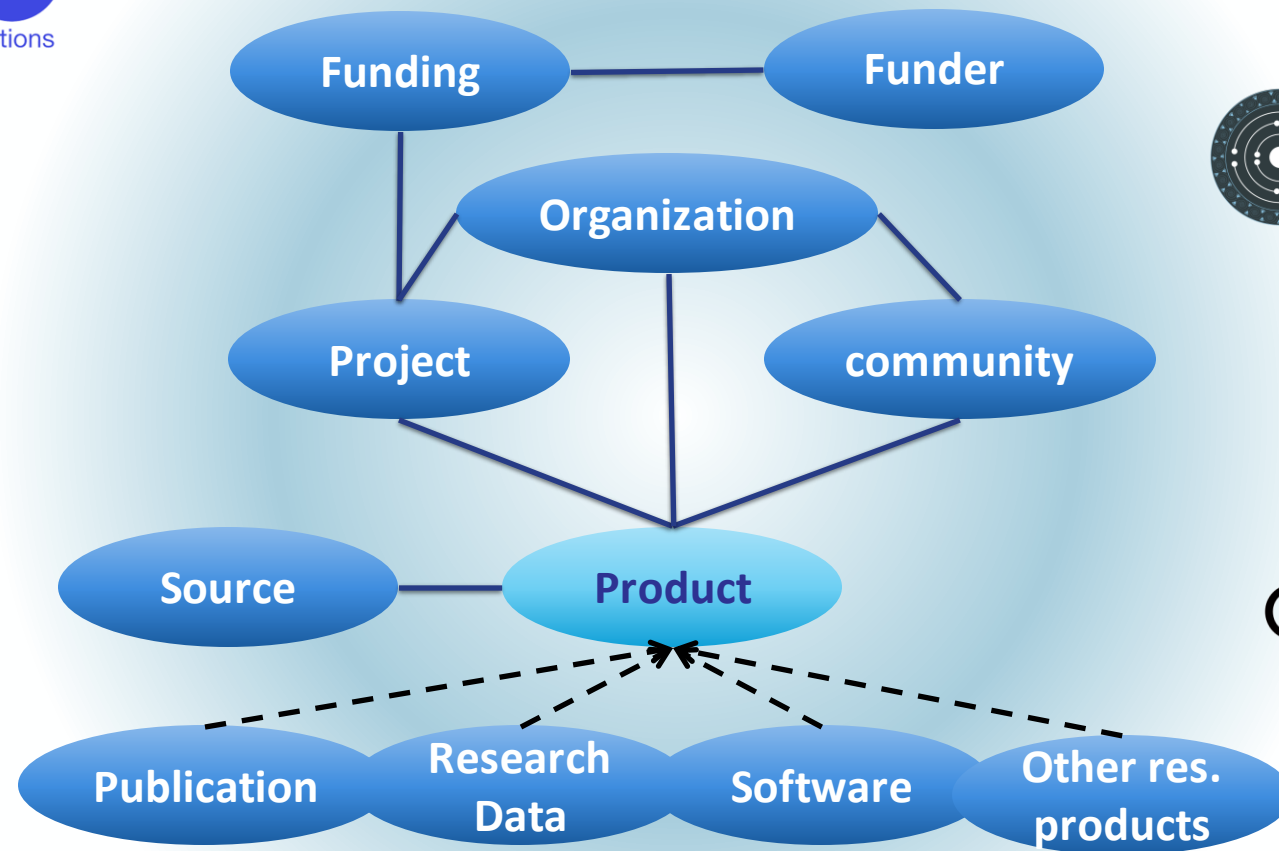- Business by SMEs
- Research by scientists

Open

Complete

De-duplicated

Transparent

Participatory

Decentralized

Trusted

OpenAIRE

European Commission

Open and Complete

De-duplicated

Entity type	# Collected records	# Records after cleaning and de-duplication	# Identified duplicates
Publications	~ 343M	~ 94M	~ 249 millions
Data	~ 5,2M	~4,6M	~ 600K
Software	~150K	~ 134 K	~ 20K
Other	~ 5M	~ 4,5M	~ 500K
Organisations	~ 380K	~220K	~ 160K

More information about the de-duplication framework used by OpenAIRE can be found searching on Zenodo for :

- "De-duplicating the OpenAIRE Scholarly Communication Big Graph" (poster)

- "GDup: De-Duplication of Scholarly Communication Big Graphs"

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Participatory

- Rely on quality scholarly communication sources of different kinds

- Include solutions and content from any interested and known content provider in scholarly communication

Institutional repositories
Aggregators
Data archives
Software repositories
Research infrastructure sources
Funder grant databases
Authors & Orgs entity registries
Publishers & journals

Transparent

- Metadata in the graph includes provenance when harvested and reliability indicators when obtained from mining

Decentralized

- Preservation and ownership beyond OpenAIRE
  - Exchanged with other graph initiatives
  - Redistributed via subscription and notification to contributing data sources (provide.openaire.eu)
- Openly accessible via APIs (develop.openaire.eu)

Trusted (in progress)

- Authors in the loop to enrich their ORCID record
- Validation of end-user "claims"

Strategic for Open Science

EUROPEAN OPEN SCIENCE CLOUD

Making the research graph an EOSC resource

Open, Trusted, Complete, De-duplicated, Participatory, Transparent, Decentralized

Actors

Institutions, research organizations, funders, content providers, researchers, SMEs, etc.

Added value services

e.g. discovery services, monitoring services

OpenAIRE   European Commission

Thank you!

Giulia Malaguarnera

giulia.malaguarnera@openaire.eu

The Road towards EOSC as seen from the national level | 20 October 2021