# The European Open Science Cloud (EOSC) versus the single Research Institution
# Drawing the scenario at local level

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# European Open Science Cloud

The European Commission is promoting the European Open Science Cloud. The EOSC is not an actual cloud service, but it is a kind of reengineering of existing e-infrastructures based on scientific data. The EOSC is a bottom-up process and will be a federated environment for the sharing and re-use of scientific data, based on existing and emerging elements in the Member States, **with lightweight international guidance and governance** and a large degree of freedom regarding practical implementation. See: http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud
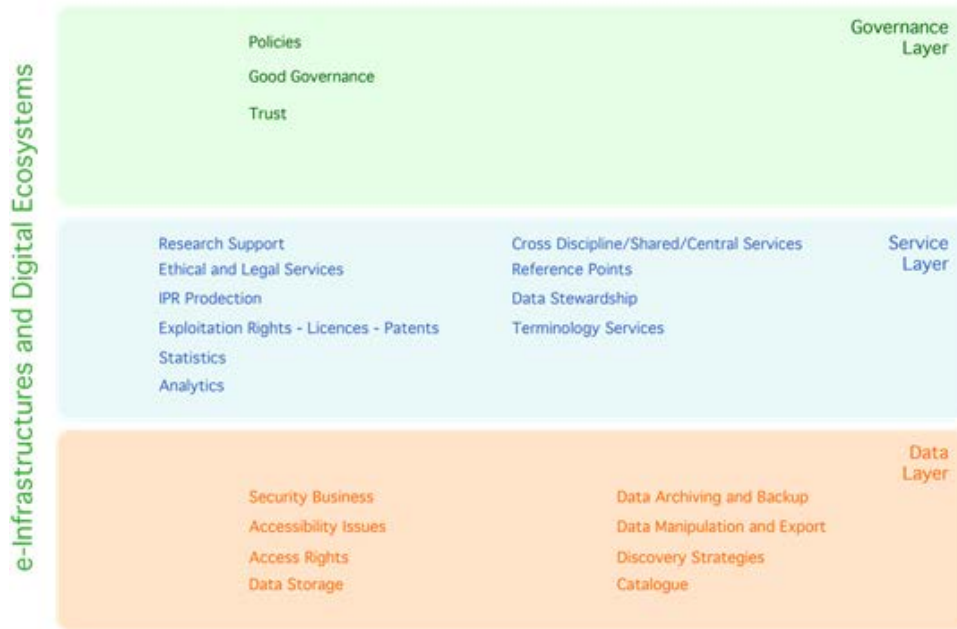
# European Open Science Cloud
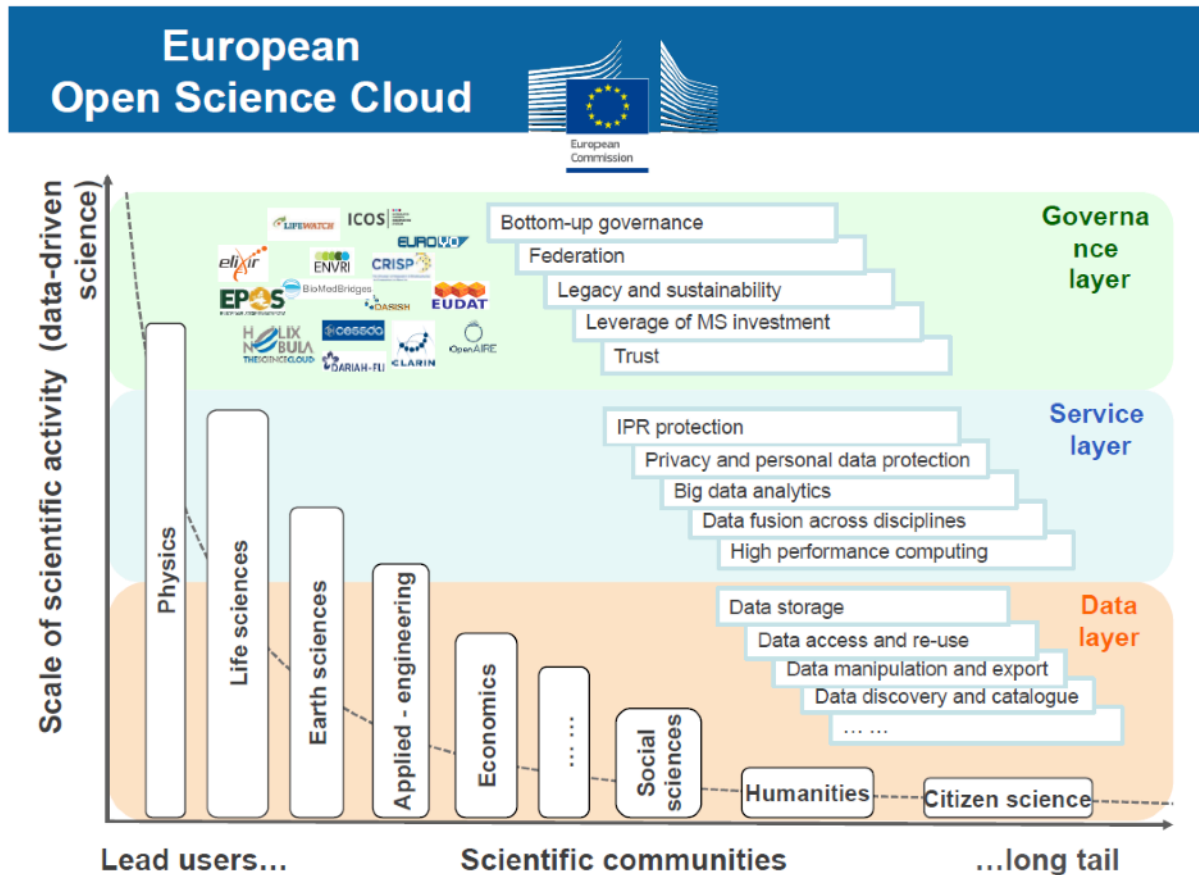


Source: "Open Science policy: Results of the consultation on 'Science 2.0: Science in transition' and possible follow up." Presented by J.C. Burgelman, June 3 2015 at e-IRG workshop.

**Open Science** is the movement to make scientific research, data, and dissemination accessible at all levels of an enquiring society. The **EOSC** is not an actual cloud service, but it is a kind of reengineering of existing e-infrastructures based on scientific data.

## EUROPEAN OPEN SCIENCE CLOUD – THE THREE LAYERS

e-Infrastructures and Digital Ecosystems

| | Governance Layer |
|---|---|
| Policies | |
| Good Governance | |
| Trust | |

| | | Service Layer |
|---|---|---|
| Research Support | Cross Discipline/Shared/Central Services | |
| Ethical and Legal Services | Reference Points | |
| IPR Prodection | Data Stewardship | |
| Exploitation Rights - Licences - Patents | Terminology Services | |
| Statistics | | |
| Analytics | | |

| | | Data Layer |
|---|---|---|
| Security Business | Data Archiving and Backup | |
| Accessibility Issues | Data Manipulation and Export | |
| Access Rights | Discovery Strategies | |
| Data Storage | Catalogue | |

**Policies, Good Governance, Trust …**

**Research Support, Legal and Ethical Issues, Exploitation Rights, Statistics, Analytics, Cross Discipline, Shared, Data Stewardship, DMP, Terminology …**

**Access Rights, Accessibility, Data Storage, Data Archiving and Backup, Data Manipulation,, Export, Discovery Strategies, Catalogue ……**

**Research Support Infrastructures** demonstrate their ability to: respond to important questions concerning their new roles;  lead in strategy and innovation; support sustainability;  create new and visionary settings ; show leadership;  build capacity; implement knowledge of research data management; manage large projects, pave the way to **Open Science**

# Open discussion:

# ROLES OF
# RESEARCH AND
# RESEARCH SUPPORT

# New Roles for Researchers and Research Support

The implementation of the EOSC requires the definition of new transversal processes concerning the digital workflow of research ("Digital Workflow"). These processes are distributed across the whole research organization.

**Digital Workflow Model**

- Description of a Digital Workflow for research processes  (composed by different segments)

- Definition of a Single Point of Reference (single point of entry) to the research support services

- Once the support request is taken in charge by the research support service, it will be treated according to the DMP main requirements and versioning
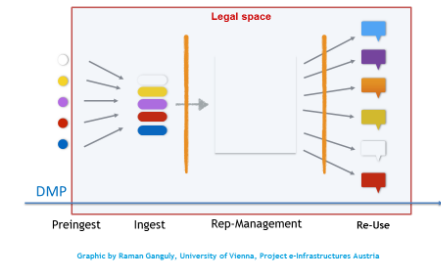
# Key Issues for the realization of EOSC at local level

» Conception and adoption of RDM Policies and good governance models

» Creation of a single point of entry for research support according to the EOSC involving a set of competences and skills (internal or/and outsourced)

» Data Management Plans (DMP) adoption and continuous update and versioning

» Training of personnel involved in research support according to the HLEG-EOSC report http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud-hleg

# About RDM-Policies

# Conception and adoption of RDM Policies /1

As mentioned RDM Policies are key issues for the implementation of the EOSC – Governance Layer.

In this context we refer to the outputs and findings of

1. the project LEARN ([www.learn-rdm.eu](www.learn-rdm.eu)) and
2. the results of the working group IOSSG: GDL-Dati della ricerca (policies sulla gestione dei dati della ricerca)

[http://wikimedia.sp.unipi.it/index.php/OA_Italia/Risorse_sugli_open_research_data#Italy](http://wikimedia.sp.unipi.it/index.php/OA_Italia/Risorse_sugli_open_research_data#Italy)

# Conception and adoption of RDM Policies /2

Main chapter of the policies are:

- Preamble
- Jurisdiction
- Intellectual Property Rights
- Handling Research Data
- Responsibilities, Rights, Duties

- 5.1. Researchers are responsible for:...
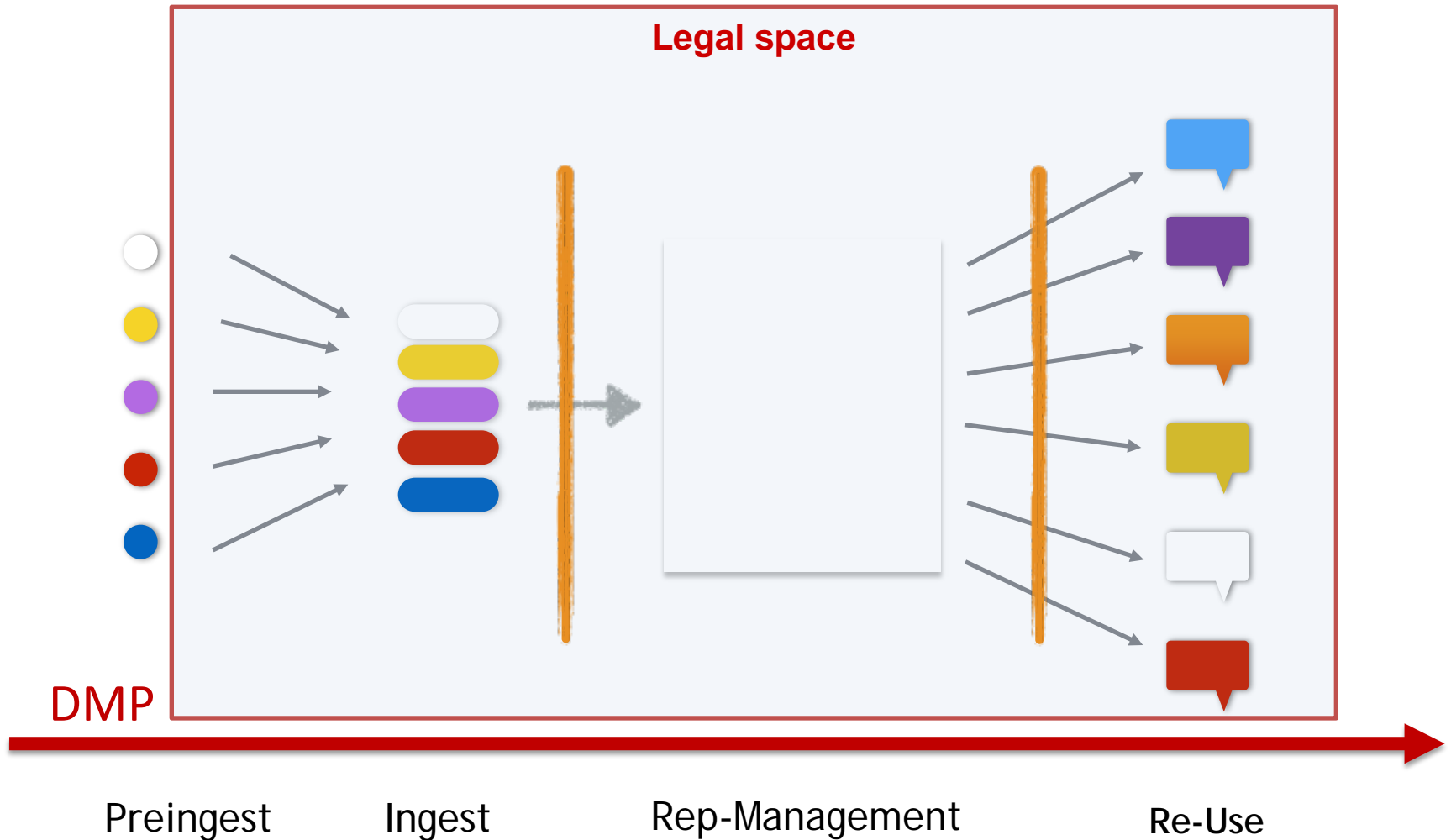- 5.2. The *[name of research institution]* is responsible for:**...**

- Validity

Source: H2020 LEARN – www.learn-rdm.eu

# About
# Data Management Plans

# Chapter I
# Description of Workflow Models

# Digital Workflow Model



Graphic by Raman Ganguly, University of Vienna, Project e-Infrastructures Austria

# Chapter II

# Data Management Plans as key elements of policies. The impact on institutions.

Data Management Plans refer to description and management of information and content acquired and generated by the projects and the context in which they are used.

These are explained within the following sections of the proposed grid:

1. Administrative details
2. Dataset description
3. Standards and metadata
4. Data Management, documentation and curation
5. Data security and confidentiality of potentially disclosed information
6. Data sharing and access
7. Legal and ethical issued
8. Responsibilities and resources
9. Relevant institutional policies on data sharing and data security

# Chapter III

# Data Management Plans: Key Issues

# DMP: Main Issues

The FAIR principles are the guiding elements in the conception of the DMPs (see also GO-FAIR https://www.dtls.nl/fair-data/go-fair/).
Particular attention should be paid to the following issues:

- the management of resources, especially time
- reproducibility and reusability of the produced data
- the assignment of proper licenses
- security (infrastructure and processes)
- compliance of legal and ethical issues

# Chapter IV

# Creation and Management of DMPs

# Creation and Management of DMPs

DMPs must be generated at the start of the project and may evolve into versions during the project development.

Several models of DMPs are available

DMPs are offered by the issuing institutions according to the domain research processes of the related disciplines.

The research workflow may have different expressions

DMPs are key elements of RDM policies. The research institutions will define the structure of DMP and offer the related support services. The Principal Investigators is the main responsible person for the compilation of the DMP.

# A USE CASE FOR DMP DEVELOPMENT

Within the informal working group GDL-Dati della ricerca → **DMP**

http://wikimedia.sp.unipi.it/index.php/OA_Italia/Risorse_sugli_open_research_data#Italy

# The European Open Science Cloud Drawing the scenario at local level

# Implementation of the EOSC at a research institution

The introduction of the EOSC at a local level at a Research Institution (RI) implies the definition and description of all criteria to be applied at the three layers of the EOSC:

1. Governance Layer
2. Service Layer and
3. Data Layer

# EOSC – Example of criteria assigned to the three layers



Governance Layer
- Policies
- Good Governance
- Trust

Service Layer
- Research Support
- Ethical and Legal Services
- IPR Prodection
- Exploitation Rights - Licences - Patents
- Statistics
- Analytics
- Cross Discipline/Shared/Central Services
- Reference Points
- Data Stewardship
- Terminology Services

Data Layer
- Security Business
- Accessibility Issues
- Access Rights
- Data Storage
- Data Archiving and Backup
- Data Manipulation and Export
- Discovery Strategies
- Catalogue

e-Infrastructures and Digital Ecosystems

# Impact of the implementation of the EOSC at a Research Institution

The realization of the EOSC will generate changements. The most relevant is the way on how research output will be at the disposal of an enquiring Open Science Society.

The generally assumed way of treating research data starting with "catalogue thinking management of data" will evolve into a "web-based" way of thinking.

The implementation of the EOSC at a local level will improve the visibility, the attraction and the ranking of the RI.

Research Support entities will be called to play a major and strategic role in this process.

The improved quality of training will attract more qualified personnel and students.

# Impact on the Governance Layer

Each RI must adopt a state of the art RDM-policy and take into account the following key issues:

- Good governance models
- Certification Processes
- Quality assurance processes
- Trust ensuring processes
- Rules of engagement

See also the recommendations of
H2020 Project LEARN www.learn-rdm.eu

# Impact on the Service Layer /1

The reengineering processes at the Service Layer must take into account the implementation of the following:

Creation of transversal Research Support services, which are able to bridge gaps between existing vertical services (due to existing organizational models), gathering different competencies and resources in one single "Reference Point".

This Reference Point might be either a service or an organizational unit. In any case the Reference Point will be able to solve questions referring to shared services, central services, cross-disciplines services.

# Impact on the Service Layer /2

At local level the Service Layer will contain e.g. these services:

- General research support
- Ethical and legal compliance support
- IPR protection, exploitation rights, assignment of licences, patents
- Statistical services
- Cost development services
- Analytical services
- Data management plans
- Data stewardship consulting
- Terminology service
- Certification service
- Consulting in innovation support
- Sustainability support
- Capacity building support
- Metadata
- RDM
- Consulting in management of large projects
- Training activities and skill development
- Open Science knowledge (incl. Citizen Science)
- Policy development and alignment
- Metrics (including KPI development)

# Impact on the Data Layer /1

We know that according to the European Commission the EOSC is not an actual cloud service, but it is a kind of reengineering of existing e-infrastructures **based on scientific data**.

Research Institutions need a description of their **own Digital Workflow** in order to understand where to start with the reengineering processes concerning their data layer.

The definition of the segments of the workflow will allow the **correct assignment of the related tasks** to be fulfilled (tasks are related to services).

# Impact on the Data Layer /2

The **DMP passes across all segments** of the digital workflow model.

The related data are organized according the FAIR principles. The term "data" includes:

research objects composed or related to: content, structured information, links, persistent IDs, licences of use, metadatasets (technical, automatically generated, contextual allegations, provenance, authorship, descriptions, classifications, educational, ...).

Links are relations connecting knowledge expressed in data. The more links the more value. In optimal cases links sould be findable, accessible and citable.

# Impact on the Data Layer /3

At local levels the Data Layer will take into account e.g. these topics:

- Security business
- Accessibility issues
- Access rights
- Data storage
- Data archiving and backup
- Data manipulation and export
- Discovery strategies
- Catalogue

# Recommendations

# Ten recommendations for the realization of the EOSC at Local Level /1

1. EOSC will be a tangible reality in 2018: start to reorganize now
2. Enhance the shift of mentality from vertical based thinking to horizontal based thinking. Create and offer new horizontal cross disciplines services. Make convergence of knowledge possible and gather efforts into Reference Points for Research Support.
3. New roles assume appropriate training and skill development: offer them
4. Policy development and alignment at all levels, especially RDM Policies: introduce them
5. Generate and adopt Data Management Plans, support Data Stewardship

# Ten recommendations for the realization of the EOSC at Local Level /2

6. Foster the transition from "catalogue thinking management of data" to a "web-based" way of thinking at all levels of the organization

7. Acknowledge the increasing relevance of the roles of research support units versus the researcher community

8. Activate all stakeholders in your RI for the realization of the EOSC

9. Get involved into the bottom-up processes of EOSC

10. Participate to the networks and initiatives concerning the EOSC

# Useful links

European Open Science Cloud
http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud

Learn Project
www.learn-rdm.eu

DMP models - UniVE
http://www.unive.it/pag/19979/

Italian Working group GDL-Dati della ricerca - IOSSG
http://wikimedia.sp.unipi.it/index.php/OA_Italia/Risorse_sugli_open_research_data#Italy