



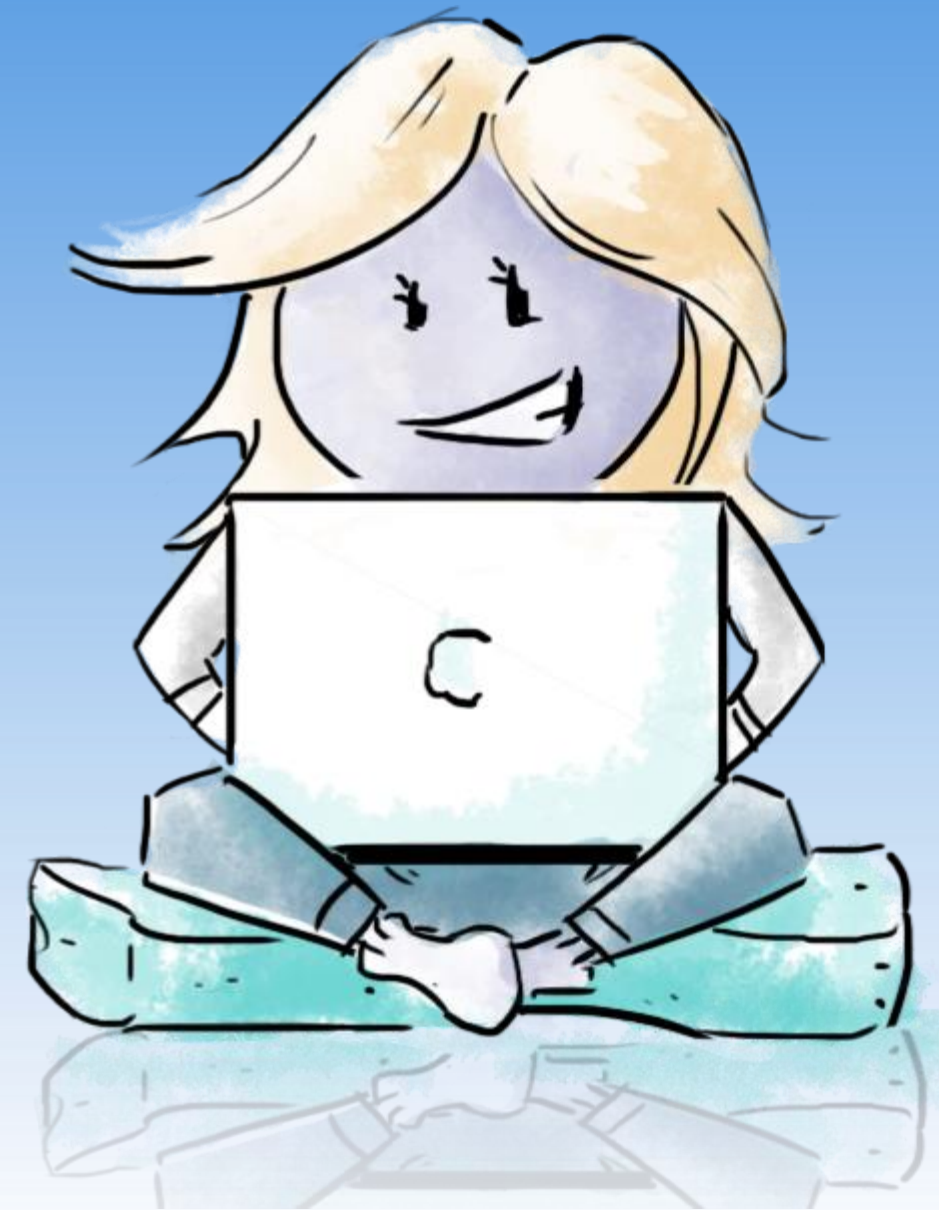
www.openaire.eu

Research Data Management: Lifecycle and Plans

Elli Papadopoulou

Athena Research & Innovation Center

Argos Product Manager (argos.openaire.eu)



RDM Lifecycles

DMPs

Argos

CHIST-ERA DMP demo

RDM Lifecycles

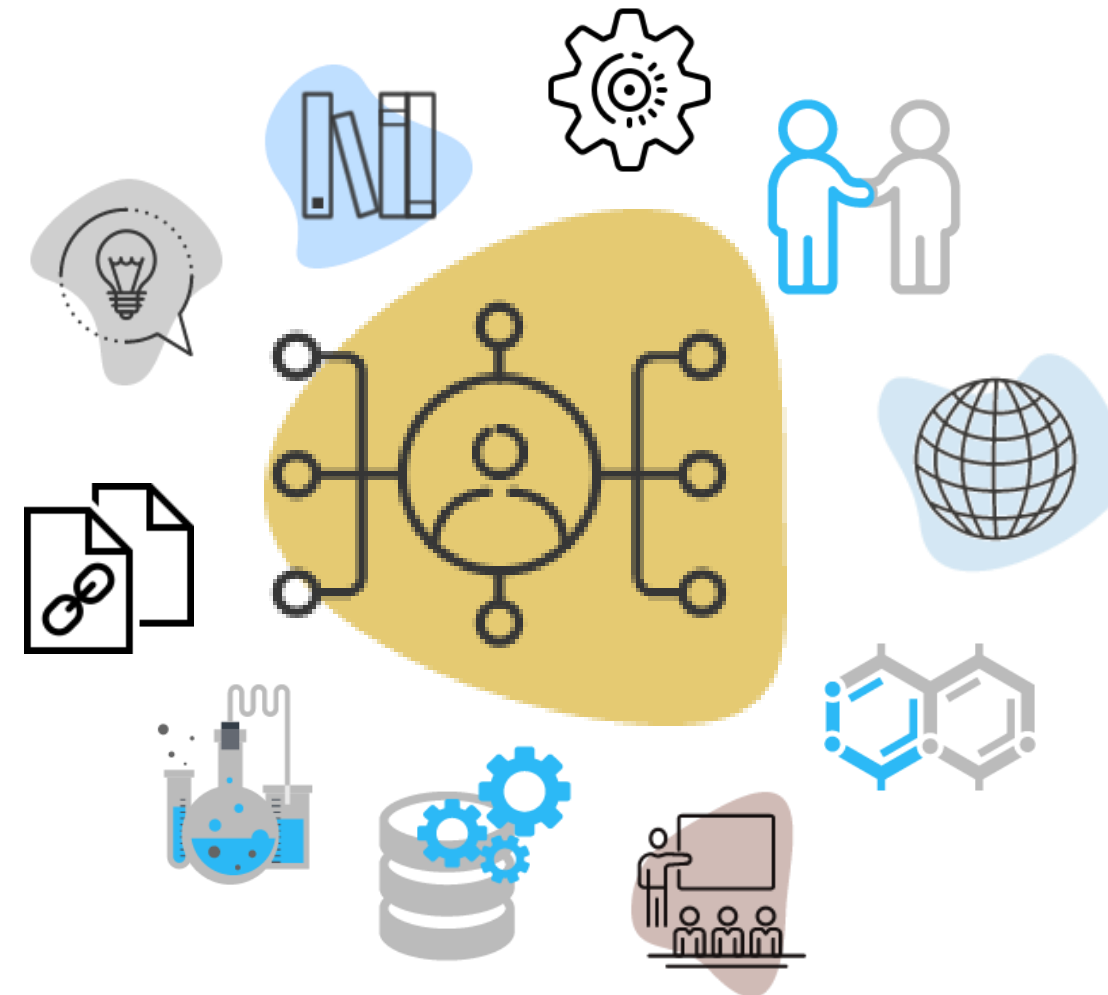
RDM - Who is involved

Researchers

- Quality data
- Follow best practices
- Comply with RDM policies
- Credits

Research Performing Organisations

- Research Excellence
- Scholarly Communication
- Monitor research
- Support research conduct



Research Funding Organisations

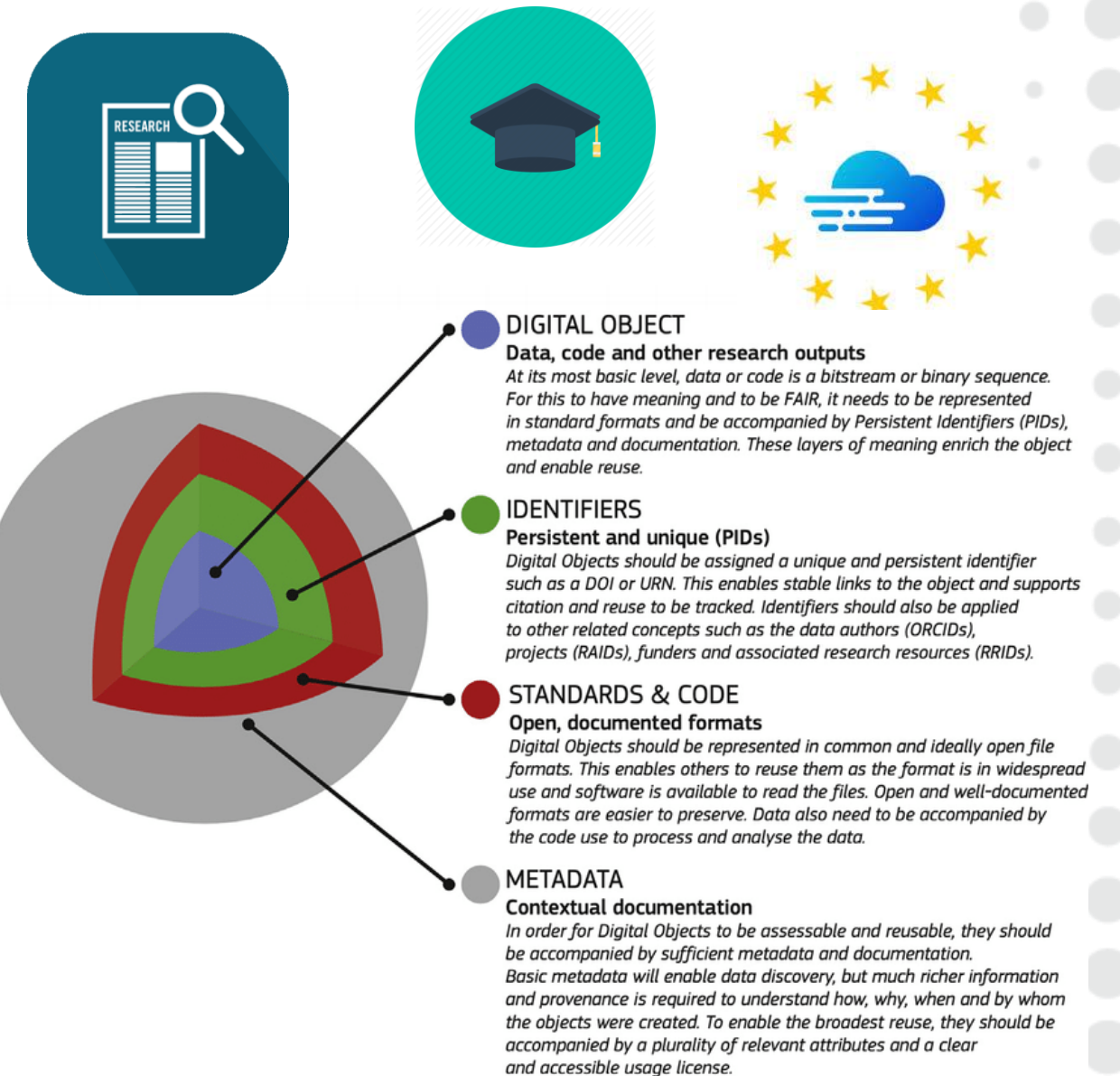
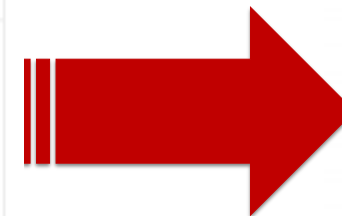
- Monitor research
- Better control of funds
- Research excellence
- Innovation

Service Providers

- Apply standards and best practices
- New tools
- Data-intensive activities

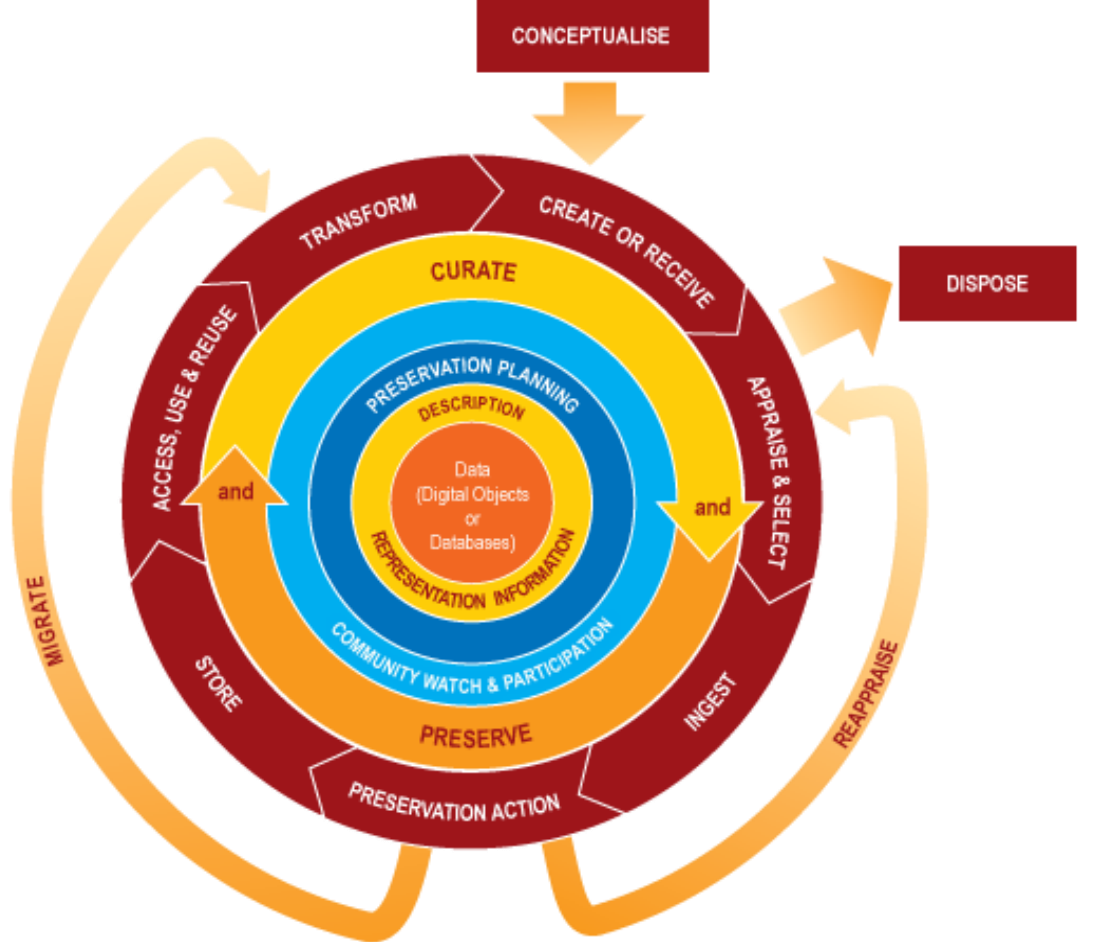
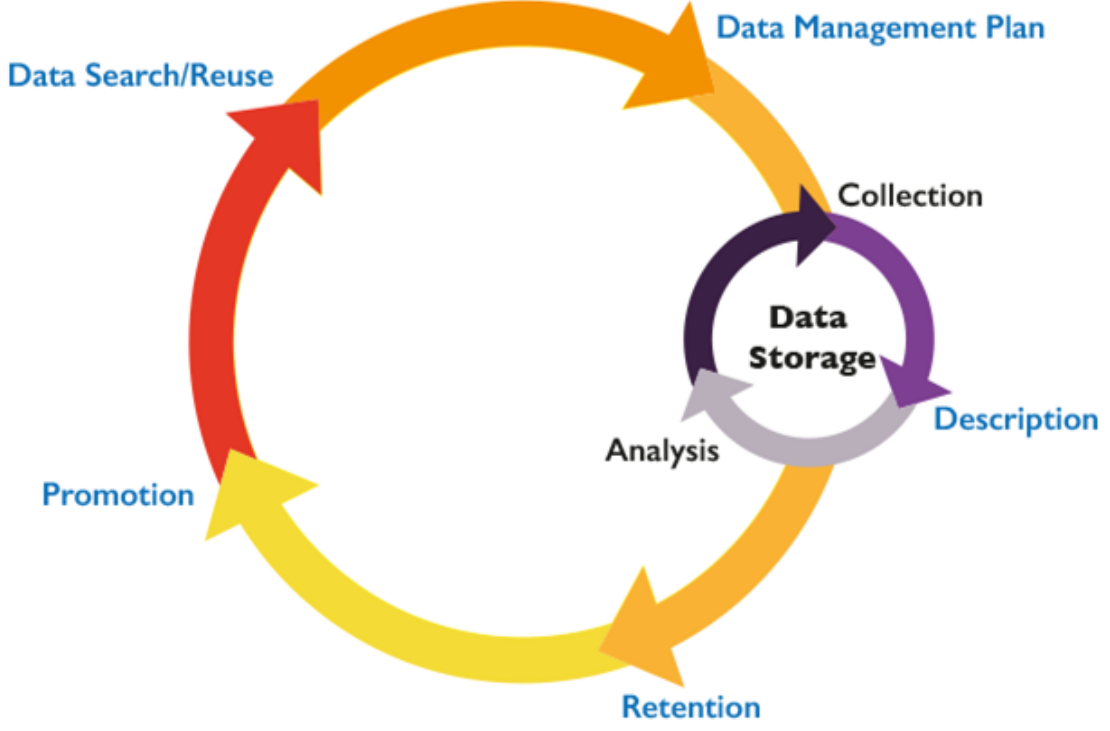
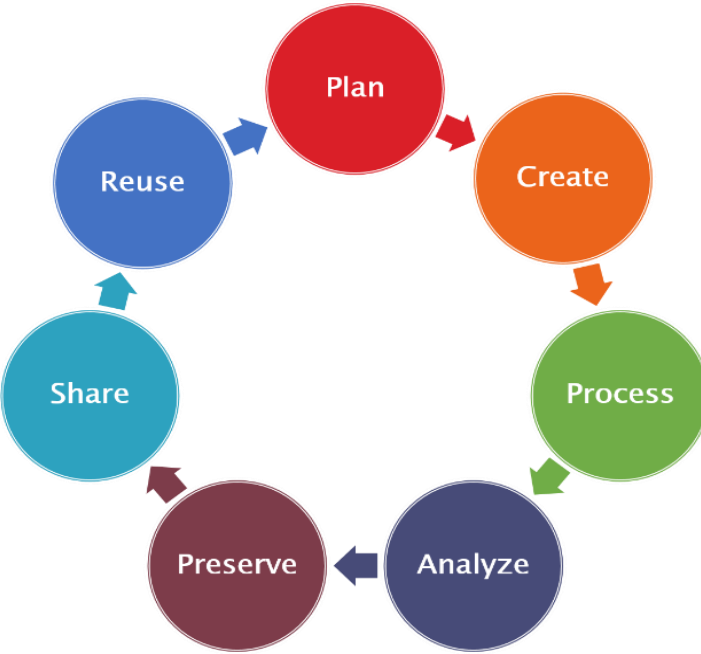
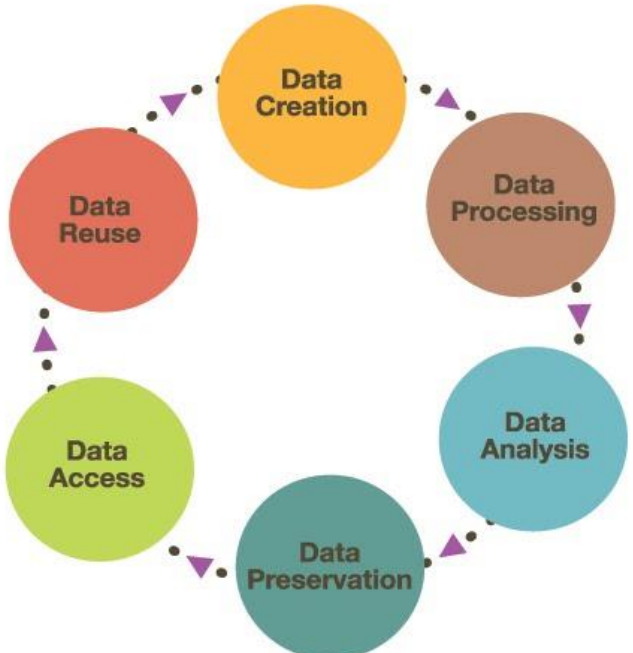
The need

Aim	Who?	How?
Repeatability	same group	same evaluation
Replicability	different group	same evaluation
Reproducibility	different group	different evaluation

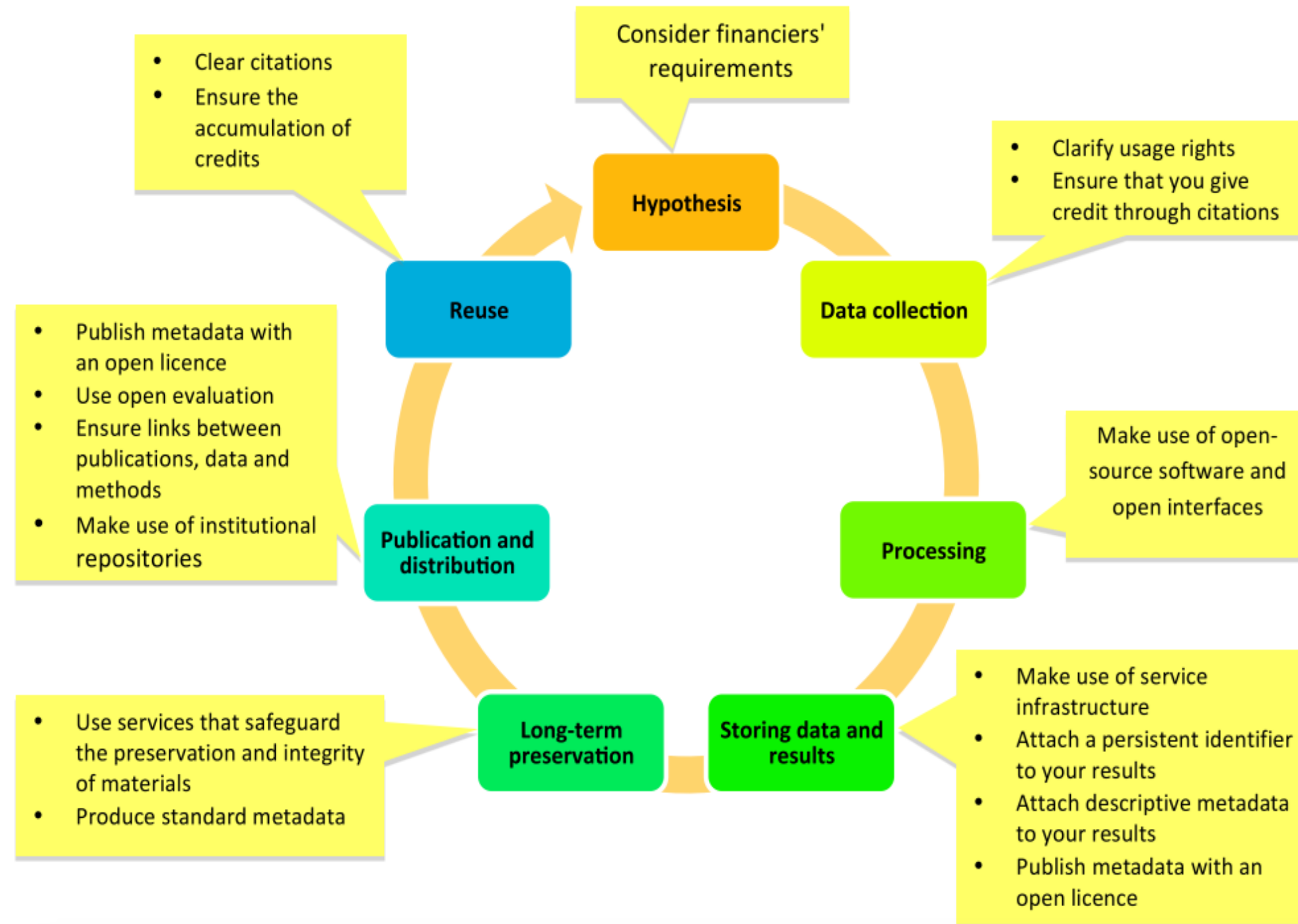


Ronald F. Boisvert. Incentivizing reproducibility. *Commun. ACM*, Vol. 59(10), pp. 5, 2016.

RDM Lifecycles



Practices in RDM lifecycles





Reused data

Existing data

e.g. Data with DOIs, in repositories

How I will be reusing existing data

-> Check copyright, licenses etc

New data

e.g. Derived from current activities

How others can reuse my data

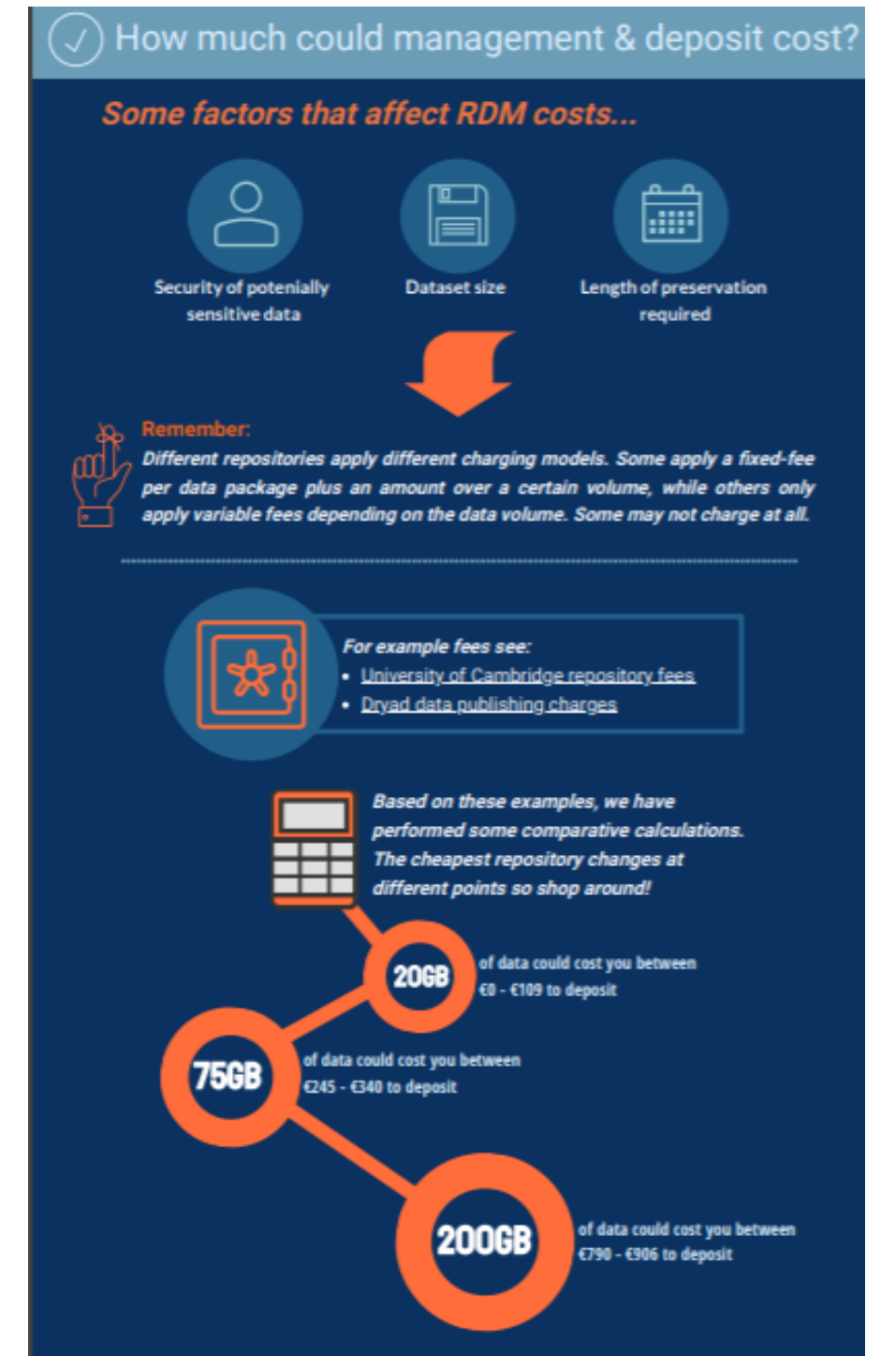
-> Add licenses, access conditions etc

Plan – Costing RDM

Plan data management of research activities following research data lifecycle steps

□ Costing RDM

- Preparing (DMP)
- Data collection, eg database, formatting, transcription, etc
- Data documentation, eg data description, metadata
- Data storage and back-up
- Data access and security, eg TTP, encryption
- Data sharing & reuse, eg anonymization, copyright, cleaning, digitization
- Overall, eg roles & responsibilities



Create / Collect

- Metadata -> Standards
 - For discovery (minimum)
 - For interoperability (rich)
- General or Domain specific
- For different outputs, eg instruments

Term Name: contributor	
URI:	http://purl.org/dc/elements/1.1/contributor
Label:	Contributor
Definition:	An entity responsible for making contributions to the resource.
Comment:	Examples of a Contributor include a person, an organization, or
Term Name: coverage	
URI:	http://purl.org/dc/elements/1.1/coverage
Label:	Coverage
Definition:	The spatial or temporal topic of the resource, the spatial applicability, or the conditions under which the resource was provided.
Comment:	Spatial topic and spatial applicability may be a named place or administrative entity or a geographic place to which the resource applies. Spatial and temporal applicability may be a named place or time period. Spatial and temporal applicability may be a named place or time period. Spatial and temporal applicability may be a named place or time period.
References:	[TGN] http://www.getty.edu/research/tools/vocabulary/tgn/index.html
Term Name: creator	
URI:	http://purl.org/dc/elements/1.1/creator
Label:	Creator
Definition:	An entity primarily responsible for making the resource.
Comment:	Examples of a Creator include a person, an organization, or a service.
Term Name: date	
URI:	http://purl.org/dc/elements/1.1/date
Label:	Date
Definition:	A point or period of time associated with an event in the lifecycle of the resource.
Comment:	Date may be used to express temporal information at any level of granularity. It may be used to indicate when the resource was created, available, revised, or when the resource's content reflects a particular point in time.
References:	[W3CDTF] http://www.w3.org/TR/NOTE-datetime
Term Name: description	

<https://www.dublincore.org/specifications/dublin-core/dces/>

OpenAIRE-Field	Metadata Element	Refinement by Vocabulary
Title (M)	datacite:title	title type
Creator (M)	datacite:creator	name type
Contributor (MA)	datacite:contributor	name type contributor type
Funding Reference (MA)	oaire:fundingReference	funderIdentifier type
Alternate Identifier (R)	datacite:alternateIdentifier	alternateIdentifier type
Related Identifier (R)	datacite:relatedIdentifier	relatedIdentifier type relation type resourceType general
Embargo Period Date (MA)	datacite:date	date type
Language (MA)	dc:language	IETF BCP 47, ISO 639-3
Publisher (MA)	dc:publisher	
Publication Date (M)	datacite:date	date type
Resource Type (M)	oaire:resourceType	COAR Resource Type Vocabulary
Description (MA)	dc:description	
Format (R)	dc:format	
Resource Identifier (M)	datacite:identifier	identifier type
Access Rights (M)	datacite:rights	COAR Access Right Vocabulary
Source (R)	dc:source	
Subject (MA)	datacite:subject	
License Condition (R)	oaire:licenseCondition	
Coverage (R)	dc:coverage	
Size (O)	datacite:size	
Geo Location (O)	datacite:geoLocation	
Resource Version (R)	oaire:version	COAR Version Vocabulary
File Location (MA)	oaire:file	
Citation Title (R)	oaire:citationTitle	
Citation Volume (R)	oaire:citationVolume	
Citation Issue (R)	oaire:citationIssue	
Citation Start Page (R)	oaire:citationStartPage	
Citation End Page (R)	oaire:citationEndPage	
Citation Edition (R)	oaire:citationEdition	

<https://openaire-guidelines-for-literature-repository-managers.readthedocs.io/en/v4.0.0/>



Process

The operational phase during which raw data is being manipulated to result to meaningful information

- Handling/curation of data
- Between data collection and data preservation
- Involves processes such as: ingestion, aggregation, analysis, classification, metadata enrichment, organisation, validation, storing, etc.
- There might be re-processing of data (e.g. data migration)
- Data disposal



Analyze

Start producing outputs and prepare for sharing

□ Methods

- Lab notebooks, end-to-end code/scripts for statistics, etc

□ Software

- R, MatLab, Python, etc



Preserve

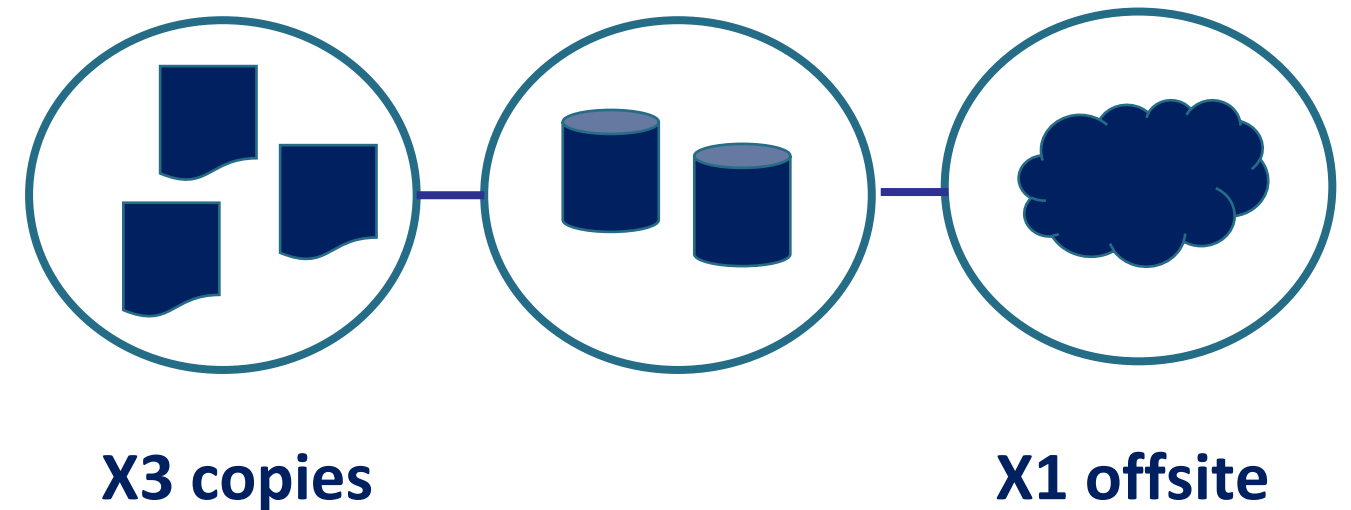
- **Risk-assessment/ Back-ups**

- Retention
- Frequency of back-up
- Storage and methods

- **Service**

Repository
- trustworthiness

X2 storage types



re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

Preserve - PIDs

Digital Objects



ARK



Researchers & Organisations



Other activities



Share

- **Naming conventions, so that data are understandable by others**
 - e.g. letters, characters, abbreviations
- **Means of sharing**
 - Commercial cloud, e.g. Google Drive
 - Cloud infrastructure for research, e.g. B2SHARE
 - Ftp server
 - USB Drives
- **Create links**
 - Link research outputs

Access

- Immediate; metadata only
 - Check embargoes
- Restrictions (Copyright, IPR etc)
- Access controls

	Open data	Safeguarded data	Controlled data
Security requirement	Suitable for fully anonymised data or data with agreement to publish personal details	Partially anonymised data or data with agreement to publish personal details, and where owner wishes to track usage	Too detailed, confidential or sensitive to be downloaded
Level of access	Accessible without user registration	Accessible to authenticated users	Accessible to authenticated users, using secure remote access or secure onsite room
Legal conditions	Under open licence, either Open Government Licence (OGL) for Crown Copyright data or Creative Commons for other data	Requiring an End User Licence and, where appropriate, special conditions agreed to, or data owner approval	Requires user accreditation and registration through training and approval by a data access committee

<https://ukdataservice.ac.uk/deposit-data/how-to/regular-depositors/negotiate>



Reuse

□ Licenses

- Conditions
- Types

□ Citations

- Specify required data citation
- Open citations



License Conditions

When using a Creative Commons license, creators choose a set of conditions they wish to apply to their work.

Attribution (by)

All CC licenses require that others who use your work in any way must give you credit the way you request, but not in a way that suggests you endorse them or their use. If they want to use your work without giving you credit or for endorsement purposes, they must get your permission first.

ShareAlike (sa)

You let others copy, distribute, display, perform, and modify your work, as long as they distribute any modified work on the same terms. If they want to distribute modified works under other terms, they must get your permission first.

NonCommercial (nc)

You let others copy, distribute, display, perform, and (unless you have chosen NoDerivatives) modify and use your work for any purpose other than commercially unless they get your permission first.

NoDerivatives (nd)

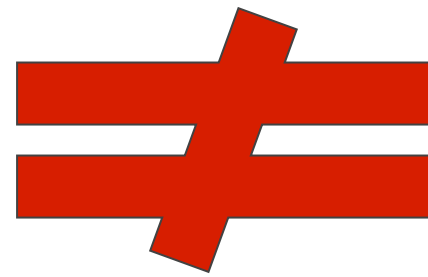
You let others copy, distribute, display and perform only original copies of your work. If they want to modify your work, they must get your permission first.

DMPs

What is a DMP?

Deliverable and “living” document

- documents processes undertaken throughout data management lifecycle, including costs



What is not a DMP?

Research assessment method

What data does it cover?

- **Scientific data and metadata**
 - ✓ Useful for verifying / validating conclusions

- ✓ That does not infringe copyright
- ✓ Non-personal and / or sensitive content

**Access
restrictions**

- **Other raw or structured data and metadata**
 - ✓ Guidelines for data reproducibility
 - ✓ Including an analysis tool / software

Restrictions in access are described in the Data Management Plan in advance

When is it delivered?

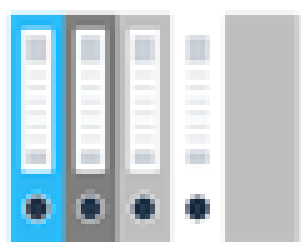
Proposal stage (not necessarily)

- What kind of data will the project create / collect?
 - Which standards will be used?
 - How will this data be shared / made available? If not, why not?
 - How will this data be curated and preserved?
-

Project stage

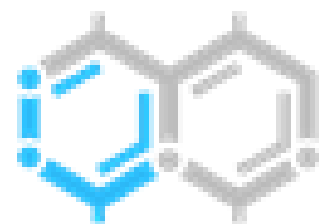
- first version of the DMP within the first semester
- revisions

Who needs DMPs?



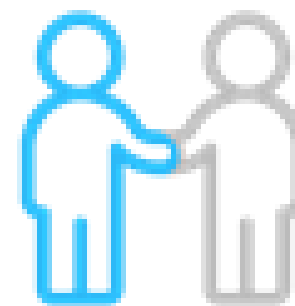
Organisations

- To track R&D outputs and any incurring bindings to them
- To identify the consumed data implications
- To facilitate R&D via data discovery and sharing



Funders

- To track direct and indirect products and impact of funding
- To identify or refine strategies w.r.t. research and data production/sharing/reuse



Researchers

- To facilitate and even enforce data referencing



open science

Open Science

- To promote FAIRness
- To promote interdisciplinary research

Who is involved in DMPs

- **Funders (offices)**
 - Define rules for DMP
- **Organisations (policy offices)**
 - Define policies
- **Projects (managers)**
 - Apply project policy aligned to Organisational and Funding policies
- **Data Managers**
 - Manage the DMP
- **Researchers**
 - Describe datasets
 - Are attributed by datasets

DMPs value

- **To increase quality of research and therefore own prestige**
- **To ensure that research outputs, including data in particular, are findable by everyone, available to people, etc.**
- **To avoid duplications of same research concepts**
- **To understand strengths and weaknesses (e.g. what discipline/unit produces more results? Are data described based on the DMP requirements? etc)**
- **To ensure research integrity and excellence of researchers**

argos

Background



- Open source software
- Configurable
- Extensible

<https://gitlab.eudat.eu/dmp/OpenAIRE-EUDAT-DMP-service-pilot>

Plan and follow your data

Create machine actionable DMPs.
Configure to best fit your discipline.
Link to EOSC components out of the box.
Share easily in your repository.

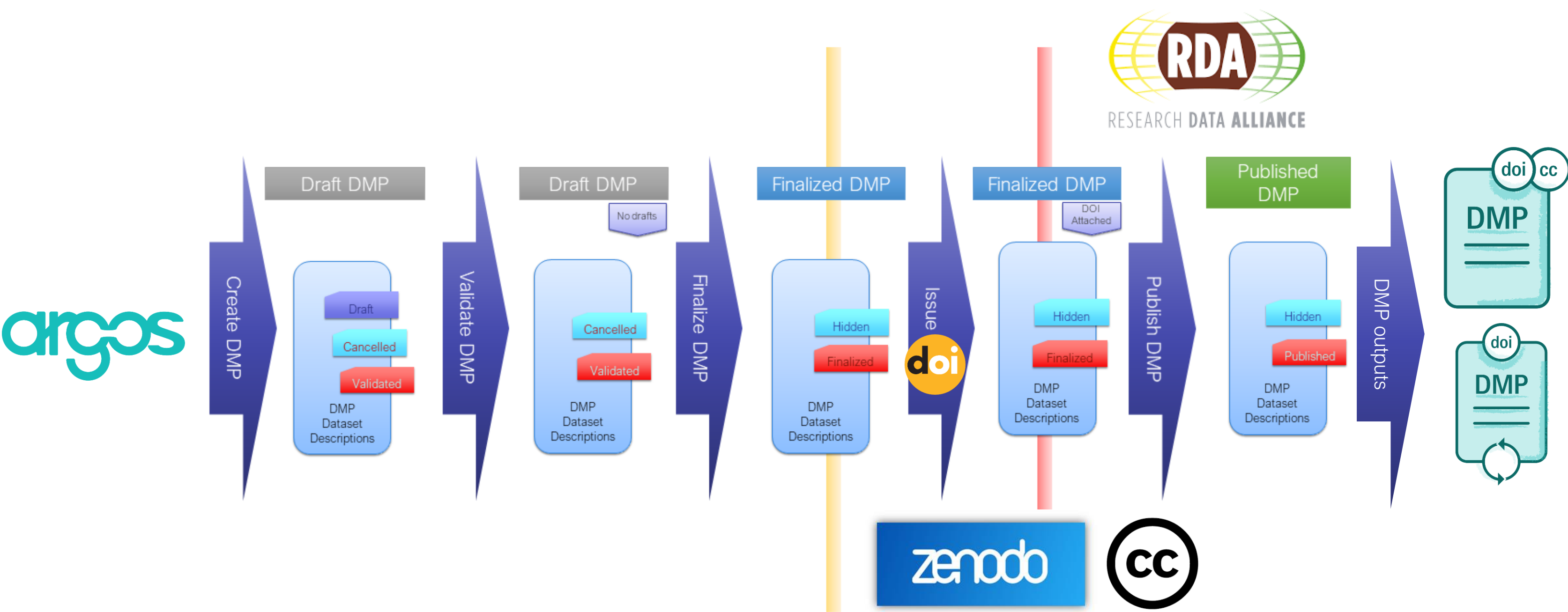
Bring your Data Management Plans closer to where data are generated, analysed and stored.

Start your DMP

argos.openaire.eu

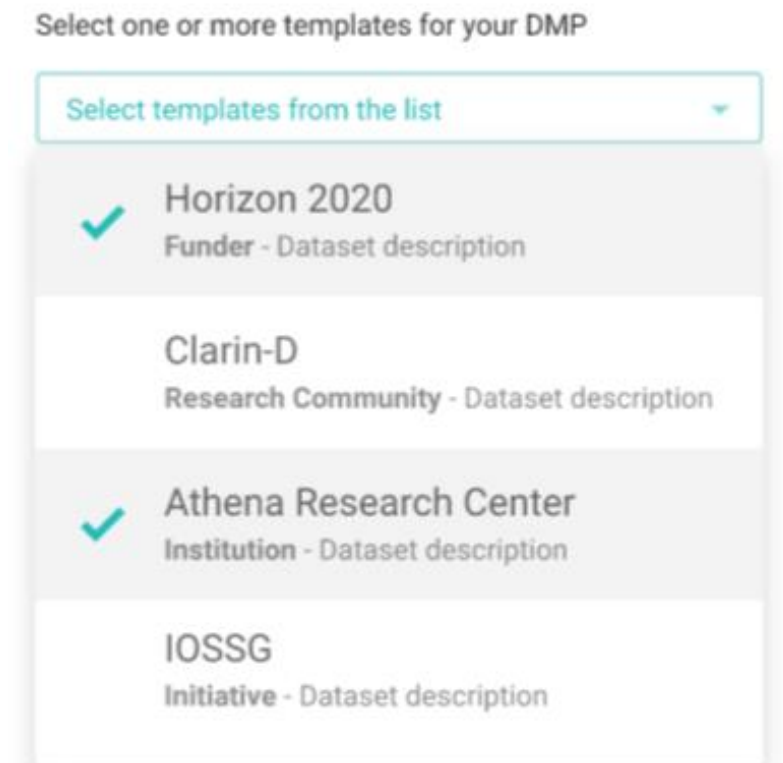
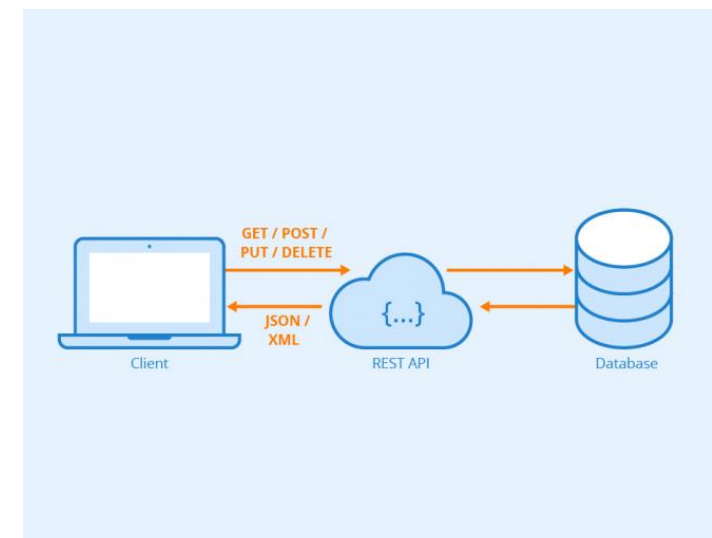
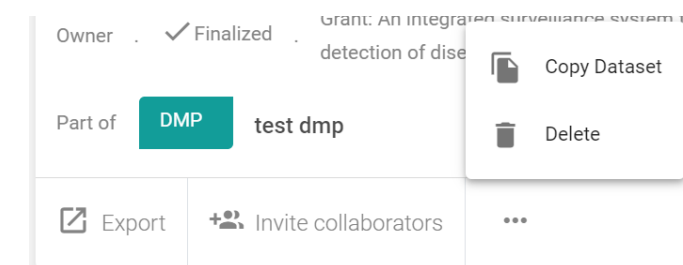
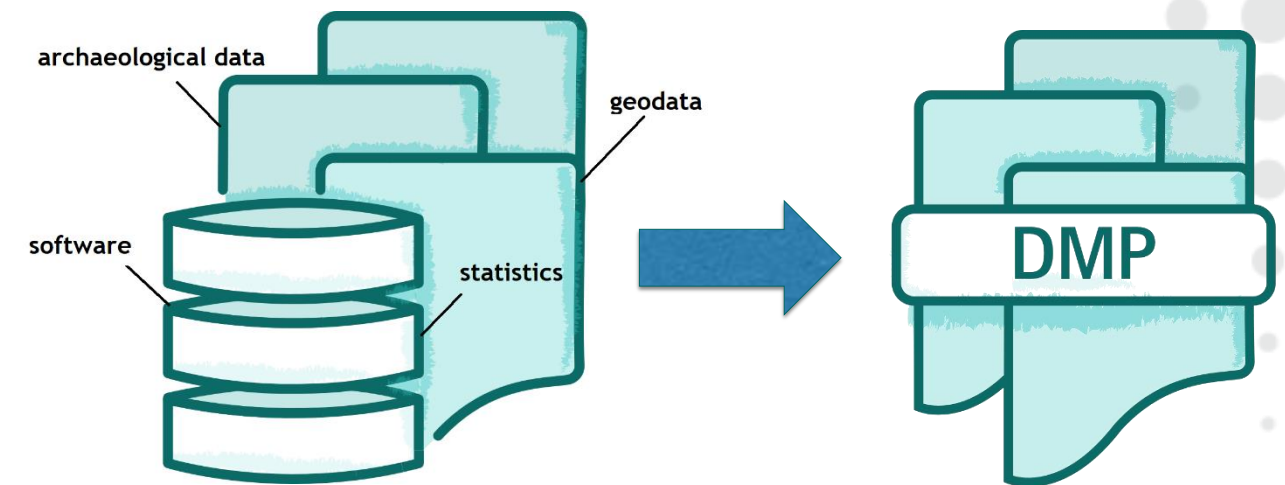


DMP Lifecycle and DMP outputs



Key features 1/2

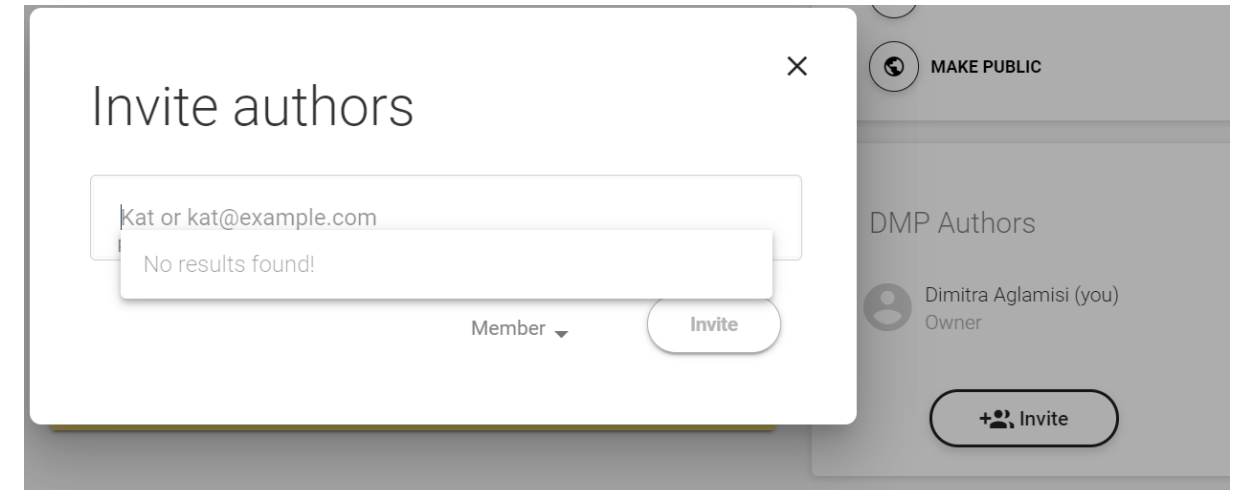
- Differentiates DMPs from Datasets
-> DMPs can have more than one descriptions of Dataset
- A DMP can contain more than one RDM templates
- Easy selection of OpenAIRE and EOSC resources



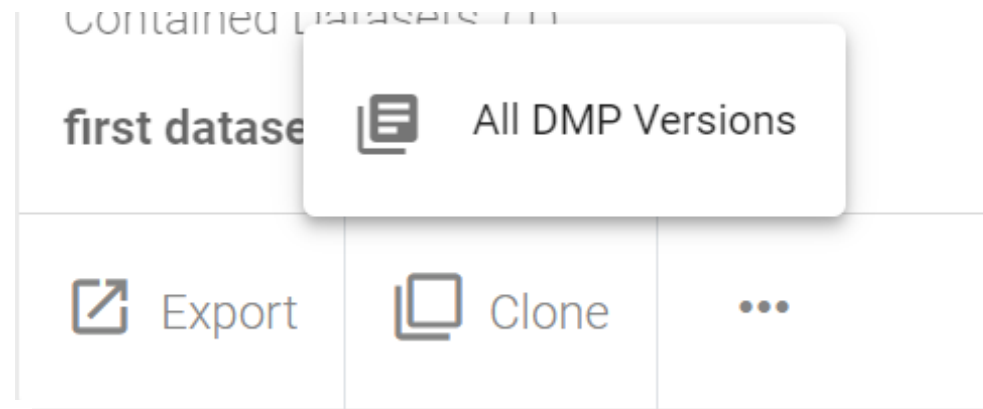
Key features 2/2

- Supports collaborative writing
- Supports exports in JSON format
-> interoperability

- Provides  and versioning of DMPs



```
"dmp": {
  "contact": {
    "mbox": "elli.libd@gmail.com",
    "name": "Elli Papadopoulou",
    "contact_id": {
      "identifier": "a7c440e8-4e29-4d84-812a-1b2d5cb605f5",
      "type": "other"
    }
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      ],
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      "security_and_privacy": [
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      "technical_resource": [
      ],
      "title": "Horizon 2020 Dataset Description"
    }
  ]
}
```



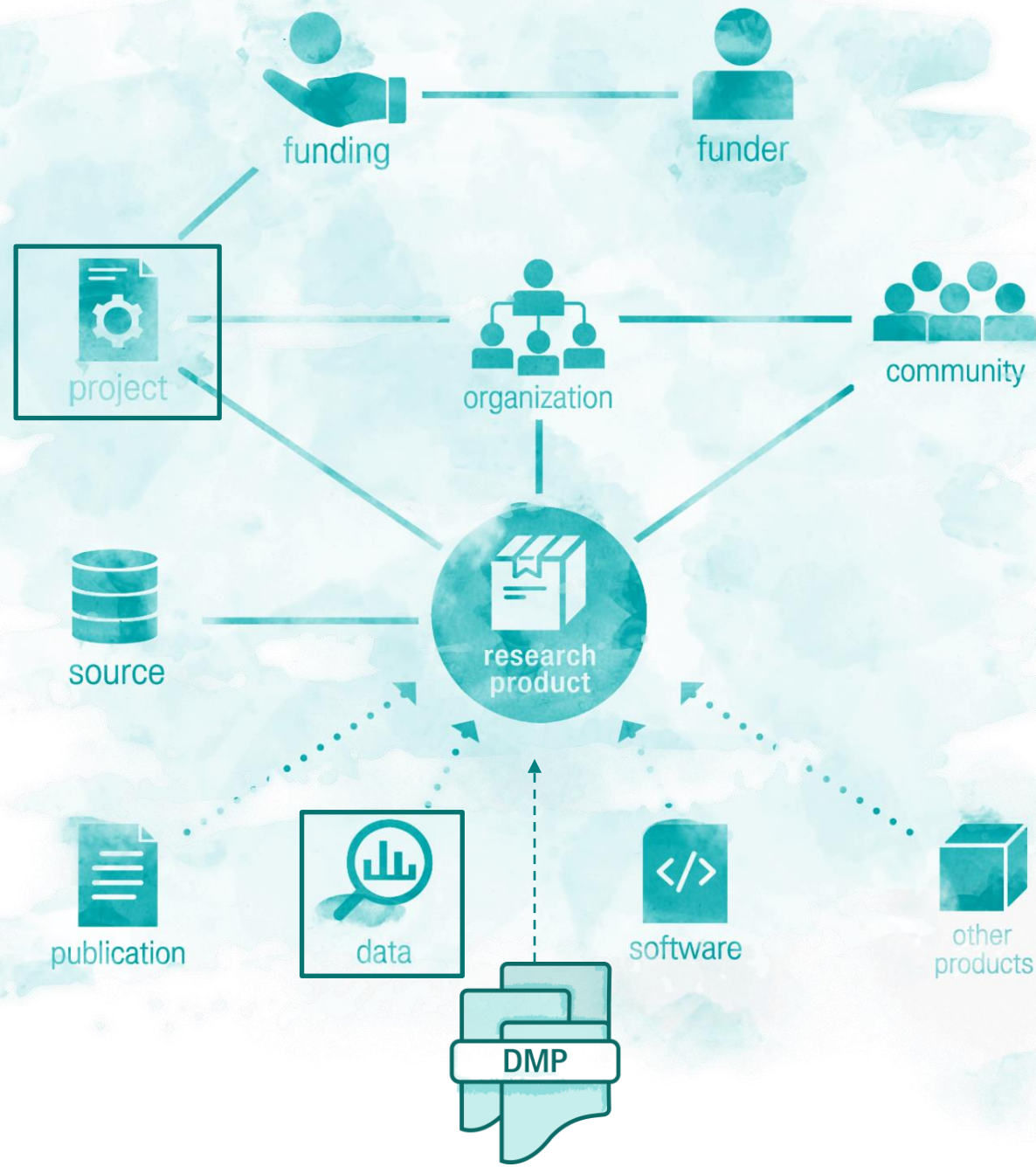
Enhancements



EXPLORE

MONITOR

DEVELOP



Open Science Primers: getting you started on good practices

Open Access Basics
An Open Access primer to get you started

An RDM Handbook
A primer on managing your research data

ALL | A | B | C | D | E | F | G | H | I | L | M | N | P | R | S | T | U

- Austria**
Gerda McNeill
University of Vienna
- Belgium**
Inge Van Nieuwerburgh
University of Ghent
- Belgium**
Emilie Hermans
University of Ghent
- Bulgaria**
Peter Stanchev
Bulgarian Academy of Sciences
- Bulgaria**
Georgi Simeonov
Bulgarian Academy of Sciences
- Croatia**
Jadranka Stajnovski
Ruđer Bošković Institute
- Cyprus**
Sylvia Kikoumidou
University of Cyprus
- Cyprus**
Natasia Ioannou
University of Cyprus
- Cyprus**
Zafeiro Marri
University of Cyprus
- Czech Republic**
Michal Růžbika
Masaryk University
- Denmark**
Asger Vaering Larsen
Syddansk Universitet
- Denmark**
Anne Thorst Mølbye
Syddansk Universitet
- Estonia**
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University of Tartu
- Estonia**
Pauli Assinen
University of Helsinki
- Estonia**
Kimmo Koskinen
University of Helsinki
- France**
André Dazy
Coqware
- Germany**
Anja Oberlander
University of Konstanz
- Germany**
Lena Dehor
University of Konstanz
- Greece**
Eli Papadopoulou
ATHENA Research & Innovation Center
- Greece**
Ilana Arava
HEAL-Link
- Hungary**
Gyongyi Karacsorny
University of Debrecen
- Hungary**
Judit Fazekas-Paragh
University of Debrecen
- Ireland**
Anna Sigríður Guðnadóttir
Londrina University
- Ireland**
Niamh Brennan
Trinity College Library
Dublin
- Ireland**
Eddie Davies
Trinity College Library
Dublin



argos

CHIST-ERA DMP demo

<https://argos.openaire.eu/>

Your opinion matters



Argos usability questionnaire

Hello,

We have just launched a newer version of Argos (<https://argos.openaire.eu/>) and we are looking to gather some feedback from you!

Argos provides a dynamic environment for collaborative writing of Data Management Plans (DMPs) that:

<https://docs.google.com/forms/d/12RSCrUjdSDp2LZLpjDKOi44cN1fLDD2q1-F66SqZlis/edit>

Help us become better;
Send us your feedback!

Useful Resources

argos

What's New: <https://www.openaire.eu/openaire-welcomes-argos-new-version>

User Guide: <https://argos.openaire.eu/user-guide>

Factsheet: <https://argos.openaire.eu/splash/assets/media-kit/Factsheet.pdf>

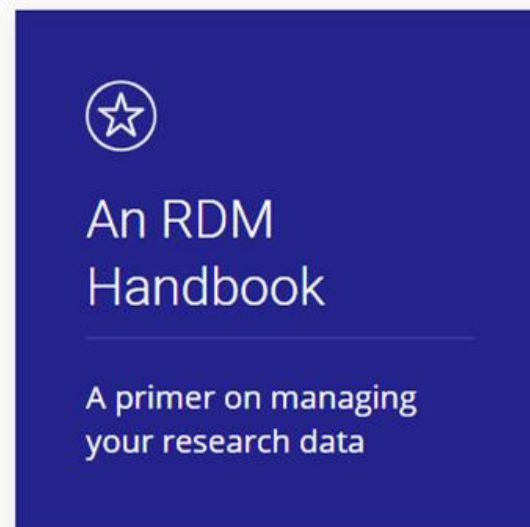
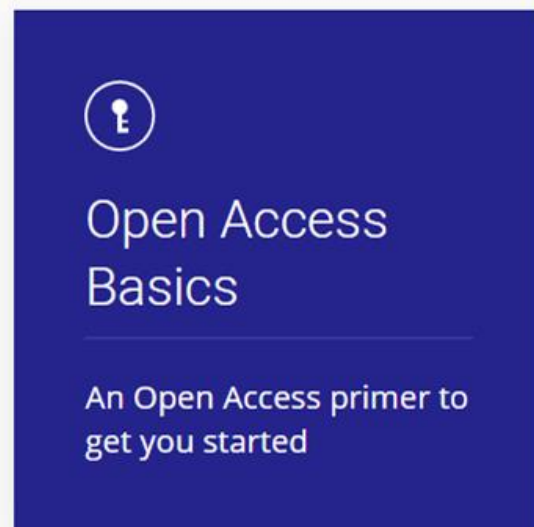
FAQs: <https://argos.openaire.eu/splash/about/faqs.html>

Contact us: argos@openaire.eu

Learn and get informed 1/3



Open Science Primers: getting you started on good practices



<https://www.openaire.eu/os-primers>

- ❑ Essential information and tutorials on basic concepts
- ❑ Supporting material
- ❑ Support through NOADs and the Helpdesk

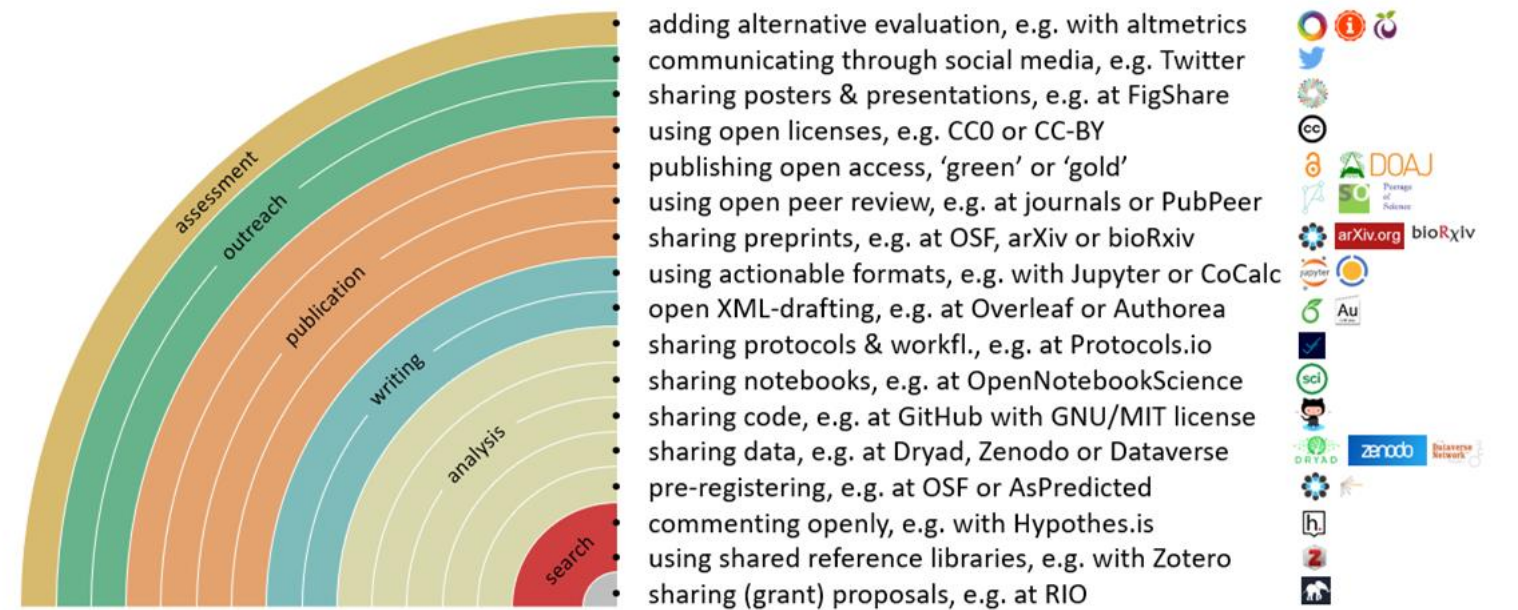
Learn and get informed 2/3



- ❑ Modules about Open Science subjects
- ❑ Self-paced e-learning option (badges)
- ❑ Anyone can add content

<https://www.fosteropenscience.eu/>

You can make your workflow more open by ...



Bianca Kramer & Jeroen Bosman <https://101innovations.wordpress.com>

DOI: [10.5281/zenodo.1147025](https://doi.org/10.5281/zenodo.1147025)

- ❑ Best practices for open workflows
- ❑ Indicative tools

https://zenodo.org/record/1147025#.XrF_IKgzY2w

Learn and get informed 3/3

Top 10 FAIR Data & Software Things

about github repository download/cite license #top10fair

The Top 10 FAIR Data & Software Things are brief guides (stand alone, self paced training materials), called "Things", that can be used by the research community to understand how they can make their research (data and software) more FAIR (Findable, Accessible, Interoperable and Reusable). Each discipline/topic has its own specific list:

Nanotechnology

Astronomy

Linked Open Data

Imaging

Music

- ❑ FAIR in disciplines
 - ❑ Basic concepts
 - ❑ Best practices
 - ❑ Activities

<https://librarycarpentry.org/Top-10-FAIR/>

OpenUP
HUB



- ❑ Review
- ❑ Assess
- ❑ Disseminate


<https://www.openuphub.eu/>

□ E-learning

- Under development – 2 courses open for enrollment
- 10 modules
 - Rationale
 - Learning Outcomes
 - Resources
 - Tools
 - Research Articles and Reports
 - Key Posts
 - Other

**OPEN
SCIENCE
MOOC**
FREE | OPEN | LEARNING

<https://opensciencemooc.eu/>



Europäisches Patentamt
European Patent Office
Office européen des brevets

e-learning centre

English (en) ▼

All courses ▼

Search 🔍

You are currently using guest access (Log in)

Lectures on PCT at the EPO

How to get a European patent
EURO-PCT

- ❑ Seminars on Patent Cooperation Treaty
- ❑ Recent developments
- ❑ How to fill an international application

<https://e-courses.epo.org/course/view.php?id=178>



- ❑ Essential skills for Data Management and Software development
- ❑ 3 streams: Software, Data, Library
- ❑ Open courses
- ❑ Pedagogy
- ❑ Instructors

<https://carpentries.org/>

IP agreements

IP Toolkit for Universities and PRIs: IP Commercialization and Knowledge Transfer

The IP Toolkit is designed to help universities and PRIs with knowledge/technology transfer and IP commercialization. It provides university managers, knowledge transfer officers and researchers with a baseline with which to develop their own entrepreneurial approach to IP management.

- Model agreements [DOC](#)
- Academic intellectual asset map [DOC](#)
- Hypothetical case studies [DOC](#)



- Material transfer agreements
- Provision of material
- Possession of material
- Safety
- Use of material
- New IP
- Publications
- ...

Material Transfer Agreement – Academic

IN THIS AGREEMENT, effective as of the _____ day of _____, [year]

*2 _____, a *3 _____, located at *4 _____ (“the Owner”)

AND

* _____, a _____, located at _____ *5 (“the Recipient”)

AGREE AS FOLLOWS:

BACKGROUND:

- A. The Owner owns or has rights to the Material.
- B. The Recipient has asked the Owner to provide a sample of the Material to the Recipient.

1. **MEANINGS**

Thank you!

Eli Papadopoulou

 elli.p@athenarc.gr

ORCID [0000-0002-0893-8509](https://orcid.org/0000-0002-0893-8509)

 [@elli_lib](https://twitter.com/elli_lib)

