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FAIR on the First Try

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2025-12-03

Co-funded by the European Union

MINISTRY OF EDUCATION, YOUTH AND SPORTS

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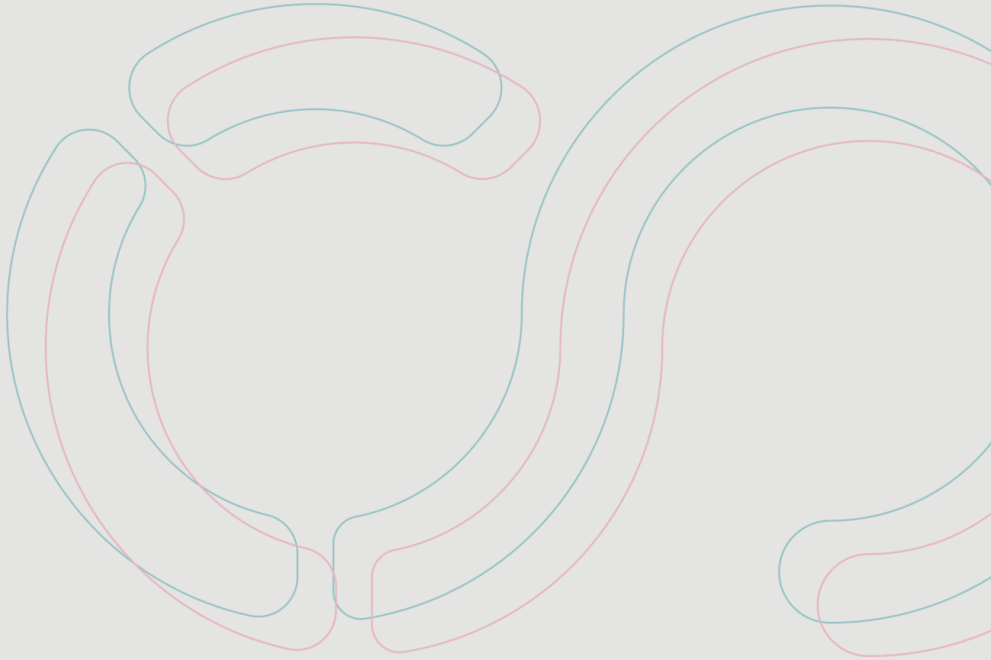
About Me

- Leader of EOSC CZ open working group Core Services.
  - https://www.eosc.cz/en/working-groups/core-services
- Leader of end-user-services oriented work packages in the NRP project.
  - https://www.eosc.cz/en/projects/national-repository-platform-for-research-data-os-i-nrp/national-repository-platform
- Open Science support team member at CERIT-SC | ICS MU
  - Focus on data management and FAIR data support.
  - Including sensitive data (SensitiveCloud).
- Good coffee and tea lover.

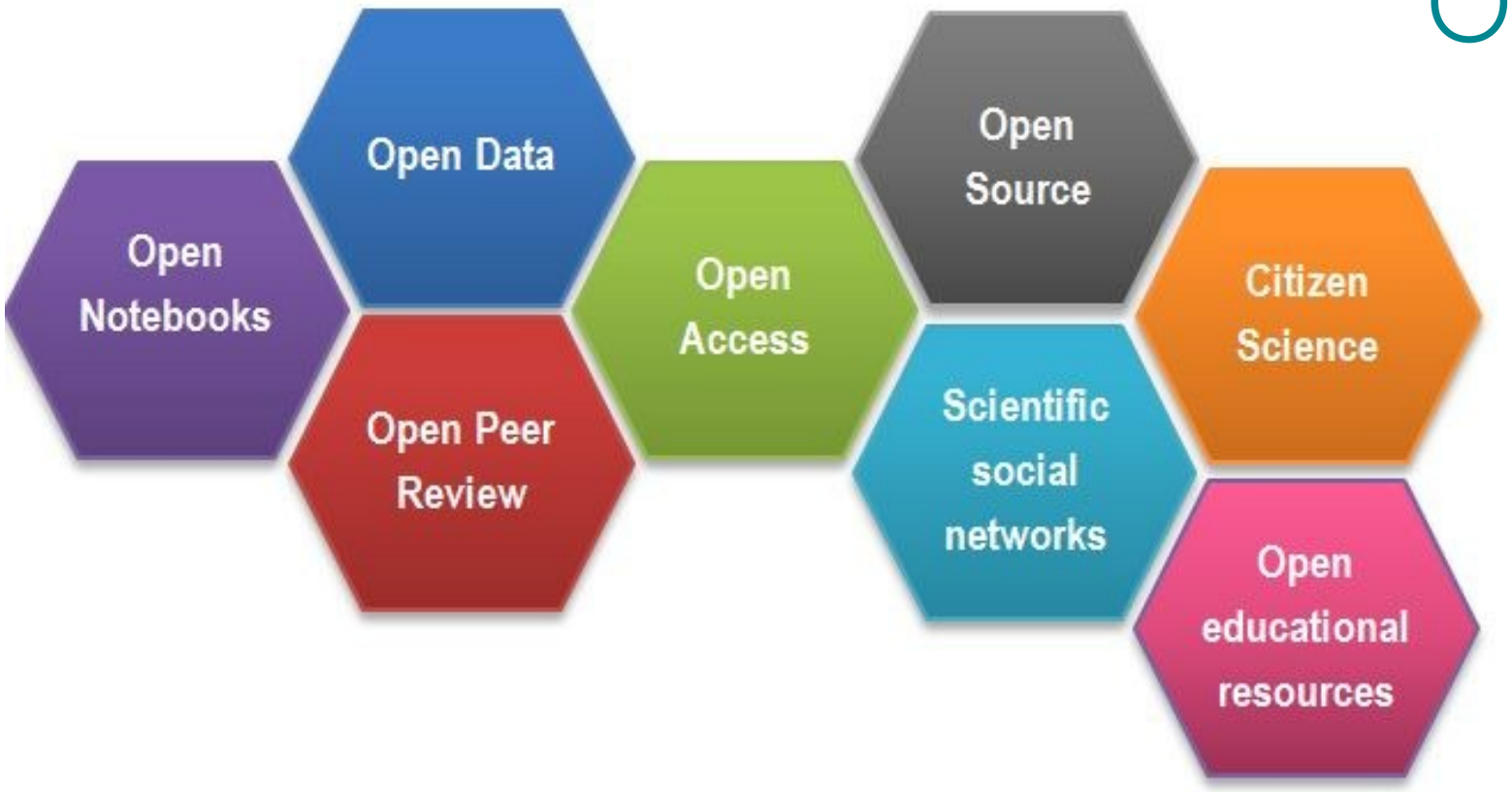
Outline

1. Context
2. Research Data Life-Cycle
3. Data, Managed Data, FAIR Data, Open Data…
4. Data Management Plan (DMP) in Research Project Calls
5. Create New or Reuse Existing Data
6. Tools and Resources to Support FAIR Principles
7. Where to Store Research Data
8. Persistent Identifiers (PIDs)
9. European Open Science Cloud (EOSC)

Context



Open Science



Source: https://www.fosteropenscience.eu/node/1420

Research Data Life-Cycle

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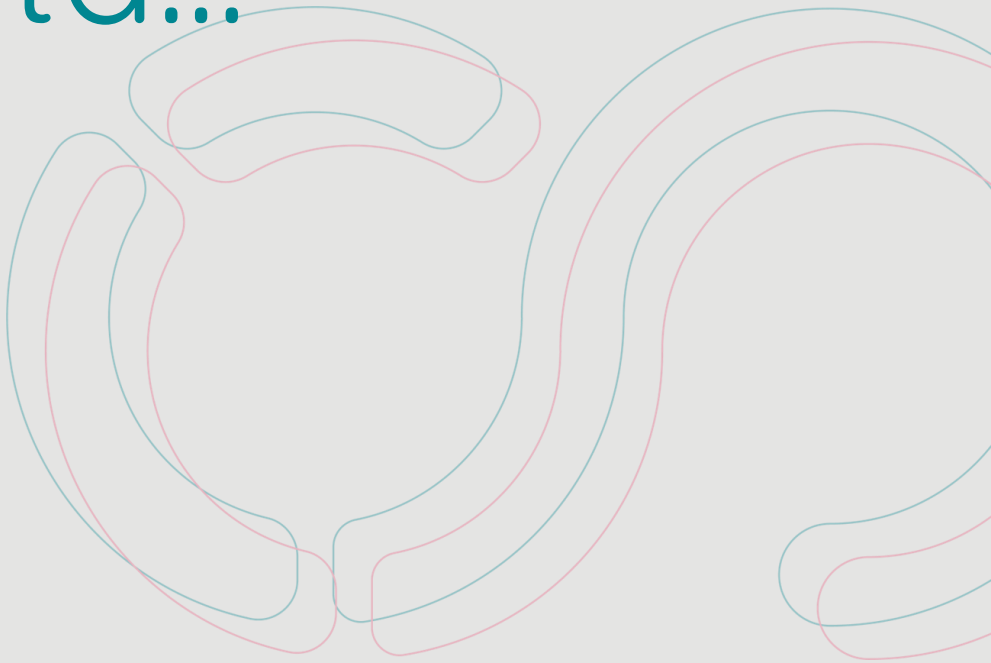
Research Data Life-Cycle

Source: ELIXIR RDMkit, https://rdmkit.elixir-europe.org/

- What data do you (re)use?
  - Including licenses that allow you to do so.
- What data do you generate and how?
- Where do you store, backup, and long-term archive data?
- How do you permanently and uniquely identify it?
- How do you process it?
- How do you analyze it?
- Where do you publish and share it?
- Who pays for all of this?
- What are the data really about?
- What are the data suitable (or unsuitable) for?
- Who can reuse the data?
- What specific data support your results?
- How can they be used to repeat your experiments, etc.?

Data, Managed Data, FAIR Data, Open Data...



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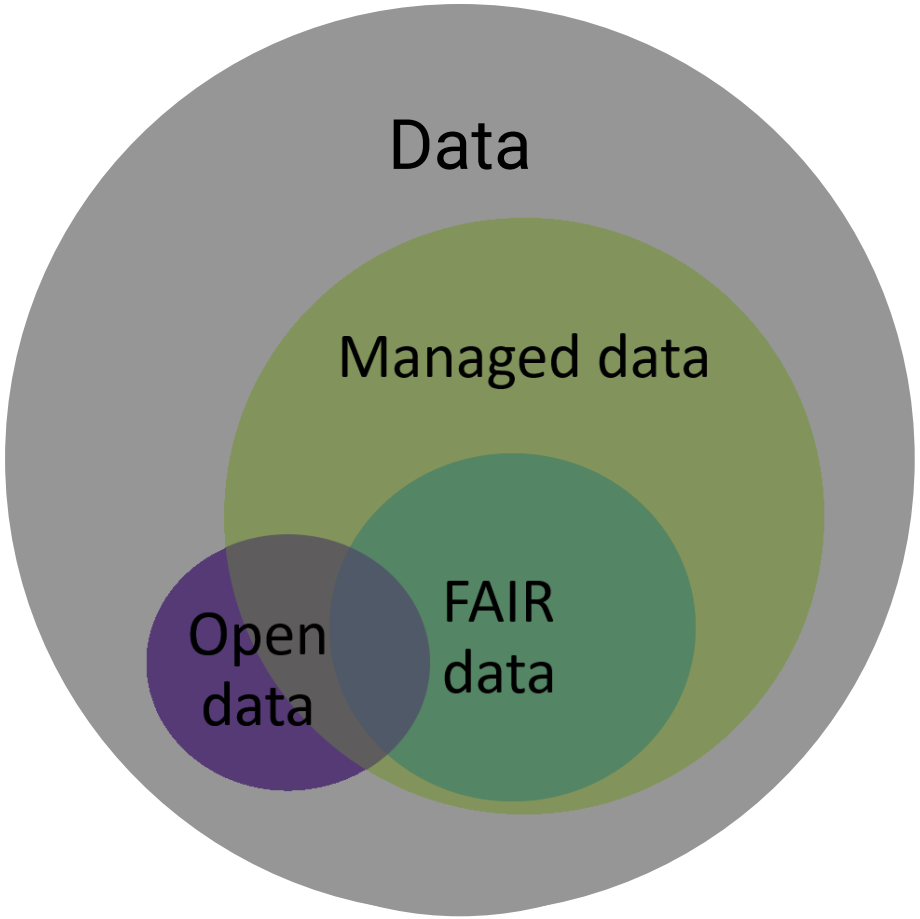
Research Data Levels



Source: FAIR příručka pro data steward komunitu v ČR, https://doi.org/10.71495/hxfc-6f57

- FAIR principles:
  - Findable
  - Accessible
  - Interoperable
  - Reusable

5-Stars Deployment Scheme for Open Data

★ Make your stuff available on the Web (whatever format) under an open license.

★★ Make it available as structured data (e.g., Excel instead of image scan of a table).

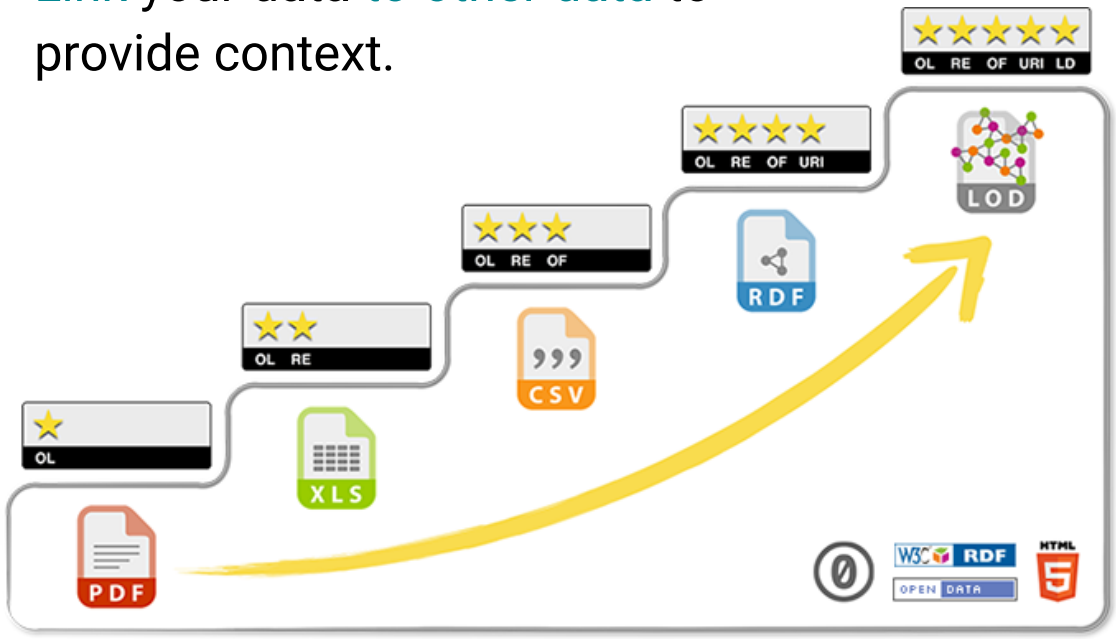
The dataset is provided in a machine-readable format that allows automated machine processing.

★★★ Make it available in a non-proprietary open format (e.g., CSV instead of Excel).

★★★★ Use URIs to denote things, so that people can point at your stuff.

★★★★★ Link your data to other data to provide context.

In 2010, Tim Berners-Lee published a system for assessing the openness of linked data, the so-called 5-Star Linked Open Data.



Source: FAIR příručka pro data steward komunitu v ČR, https://doi.org/10.71495/hxfc-6f57

FAIR Principles

https://www.go-fair.org/fair-principles/

- FAIR is an abbreviation of the four English adjectives denoting these principles.
- Findable
  - For people and machines.
  - We need (machine-readable) metadata that is available to search engines/users.
  - We need unique persistent identifiers (PIDs).
- Accessible
  - Technical solution for access to data and metadata – use standard open protocols (e.g. https://) common in the field.
  - The data does not have to be freely accessible – then the authentication mechanisms should be common and standard (e.g. OpenID Connect) in the field.
  - If the data itself is inaccessible (not public or has been deleted), at least the metadata should be freely available (for Findable and audit-record of the deleted data).
- Interoperable
  - Similar to Accessible, but not about access protocols, but about the data itself.
  - Data and metadata in machine-readable open formats common in the field.
  - Other data/metadata should be referenced using standard persistent identifiers.
- Reusable
  - Rather the goal we are aiming at in the previous points, rather than a separate principle.
  - Clear declaration of license, use of open licenses (e.g. CC0, CC-BY).
  - Data and metadata in industry-standard and usable formats.
  - Provenance metadata – a relatively new area dealing with the metadata record of all operations with data from their inception to the present.

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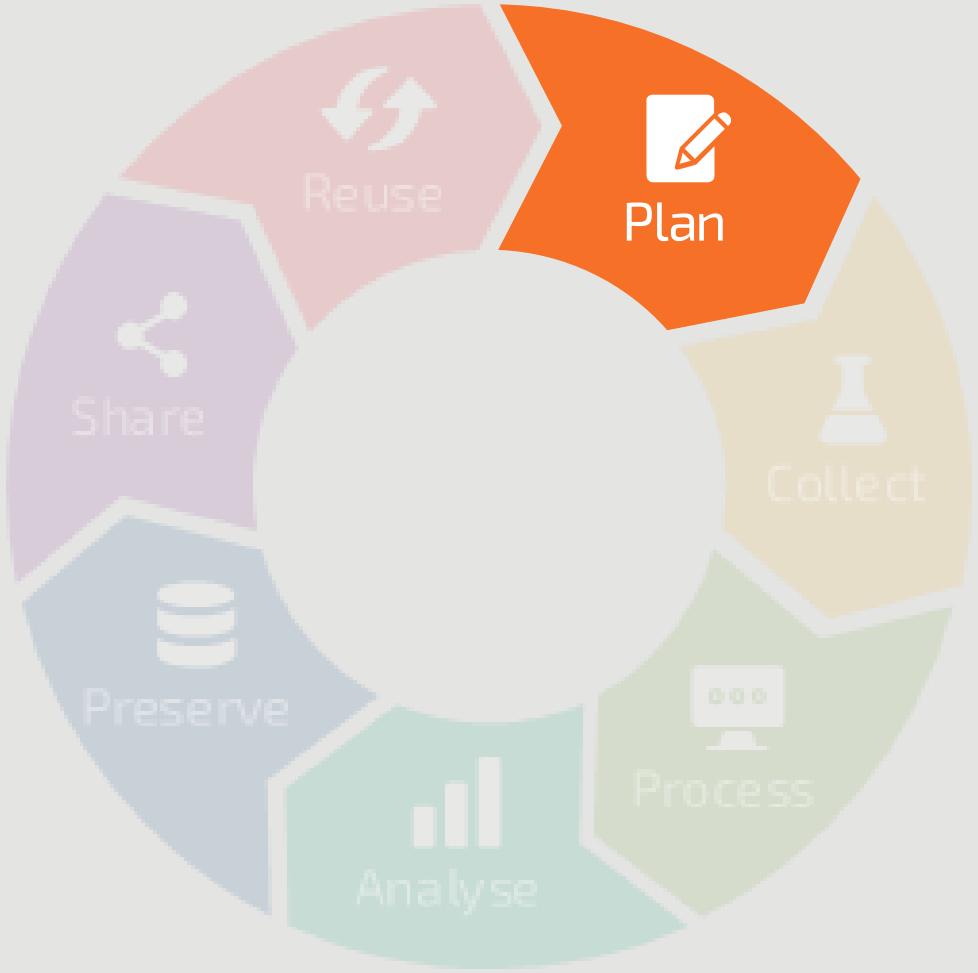
FIP Mini-Questionnaire

https://www.go-fair.org/how-to-go-fair/fair-implementation-profile/

Building your FAIR implementation profile.

Community description	
Name of Community	*e.g. ENVRI*
Description of Community	
Supporting Links	
Research Domain	*e.g. Environmental Sciences*
Data Steward	*e.g. ORCID #*
Date of FIP creation	

FAIR principle	Question	FAIR enabling resource types	Your answers
F1	What globally unique, persistent, resolvable identifiers do you use for metadata records?	Identifier type	*e.g. PURL, DOI*
F1	What globally unique, persistent, resolvable identifiers do you use for datasets?	Identifier type	
F2	Which metadata schemas do you use for findability?	Metadata schema	
F3	What is the technology that links the persistent identifiers of your data to the metadata description?	Metadata-Data linking mechanism	
F4	In which search engines are your metadata records indexed?	Search engines	
F4	In which search engines are your datasets indexed?	Search engines	
A1.1	Which standardized communication protocol do you use for metadata records?	Communication protocol	
A1.1	Which standardized communication protocol do you use for datasets?	Communication protocol	
A1.2	Which authentication & authorisation technique do you use for metadata records?	Authentication & authorisation technique	
A1.2	Which authentication & authorisation technique do you use for datasets?	Authentication & authorisation technique	
A2	Which metadata longevity plan do you use?	Metadata longevity	
I1	Which knowledge representation languages (allowing machine interoperation) do you use for metadata records?	Knowledge representation language	
I1	Which knowledge representation languages (allowing machine interoperation) do you use for datasets?	Knowledge representation language	
I2	Which structured vocabularies do you use to annotate your metadata records?	Structured vocabularies	
I2	Which structured vocabularies do you use to encode your datasets?	Structured vocabularies	
I3	Which models, schema(s) do you use for your metadata records?	Metadata schema	
I3	Which models, schema(s) do you use for your datasets?	Data schema	
R1.1	Which usage license do you use for your metadata records?	Data usage license	
R1.1	Which usage license do you use for your datasets?	Data usage license	
R1.2	Which metadata schemas do you use for describing the provenance of your metadata records?	Provenance model	
R1.2	Which metadata schemas do you use for describing the provenance of your datasets?	Provenance model	



Data Management Plan (DMP) in Research Project Calls

Open Science and Projects

- Requirements for compliance with Open Science principles have already been established as a standard part of research project calls.
- Often mandatory and optional principles:
  - Mandatory: Open Access, Data Management (DMP)
  - Optional: Citizen Science, Open Source, Preprints, …
- DMP is a living document: Regular updates are expected.

ENLIVEN ('Encouraging Lifelong Learning for an Inclusive and Vibrant Europe') Data Management Plan

- https://hdl.handle.net/11353/10.1139743
- DMP from the area of Social Sciences.
  - Audio and video data, transcription of interviews.
  - Restricted access to the data.
- Use of existing data + collection of own data.
- Continuous updating of the DMP.
  - Changes are summarized in a table.
  - Migration of some of the data to the UK.
  - Data saved encrypted in MS O365 Teams.
- Ethic aspects are described in a standalone document referenced from the DMP.
- Joined project of multiple institutions → explicit definition of responsibilities.
- Nice description of data protection.
  - Information on anonymization procedures in the DMP appendix.
- Documentation and produced publications (including project website) are covered in the DMP.
- Description of the used hardware and software could be more detailed.
  - Nevertheless, the backup process and strategy are described.
- Described intellectual properties and QA process.

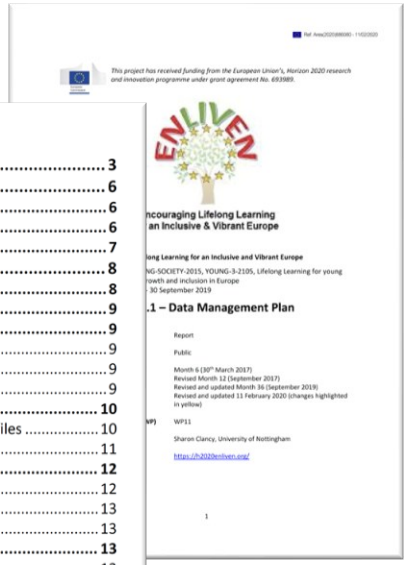
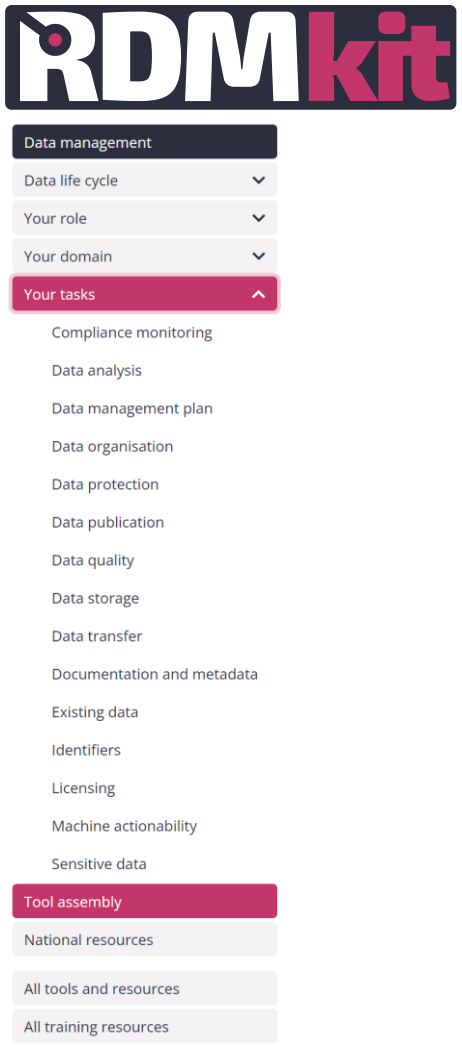


Table of Contents

Create New or Reuse Existing Data

Create New or Reuse Existing Data

- **Check the licence** if you are going to reuse an existing data/software!
- The ELIXIR Research Data Management Kit (RDMkit)
  - https://rdmkit.elixir-europe.org/
  - Online guide to data management in the life sciences.
  - Links to several external sources.

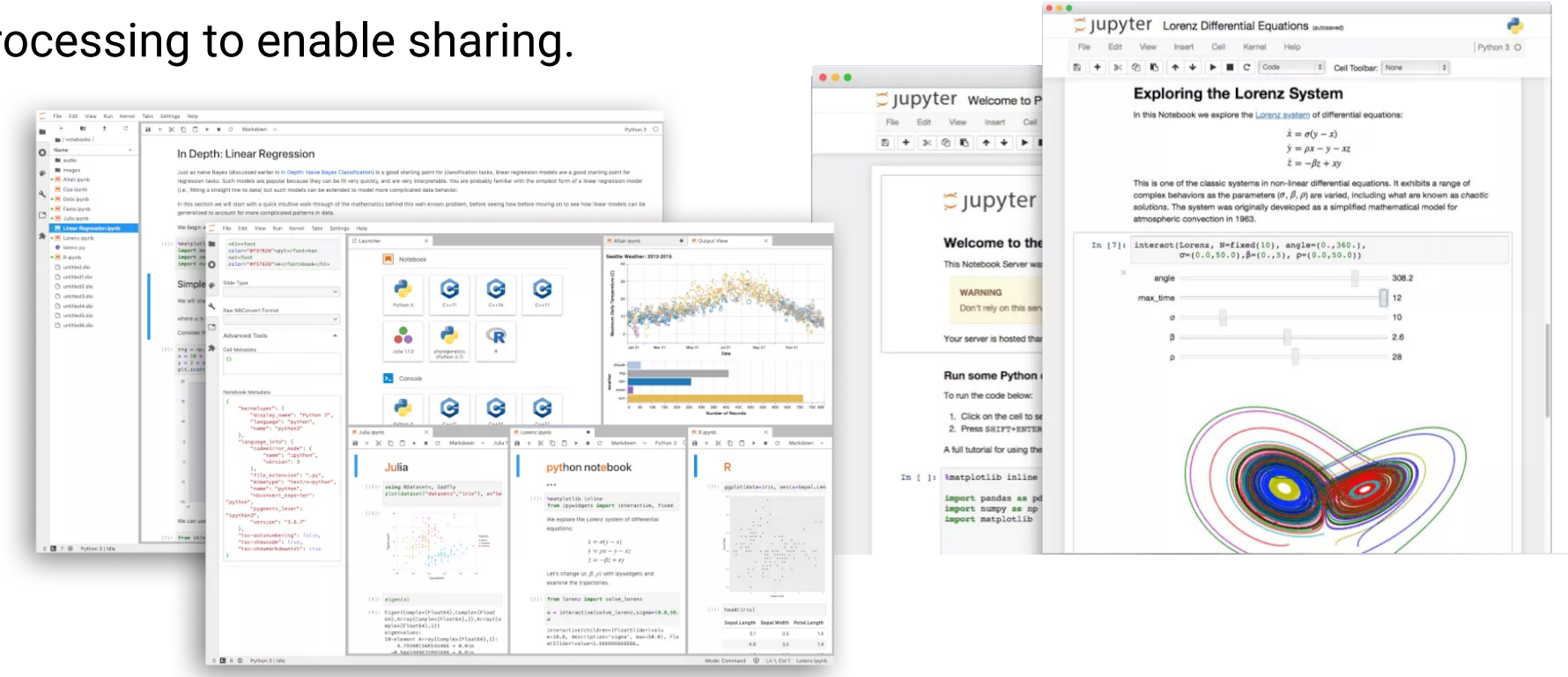


Tools and Resources to Support FAIR Principles

Tools and Resources to Support FAIR Principles

JupyterLab

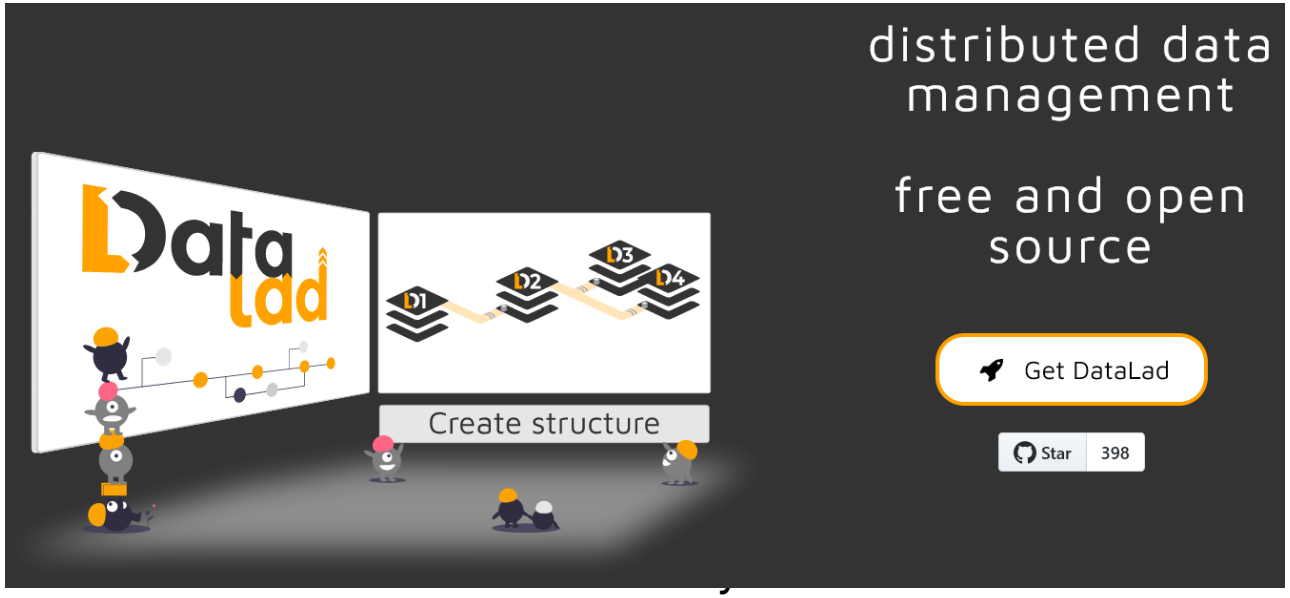
- https://jupyter.org/
- Documented data processing to enable sharing.



Tools and Resources to Support FAIR Principles

DataLad

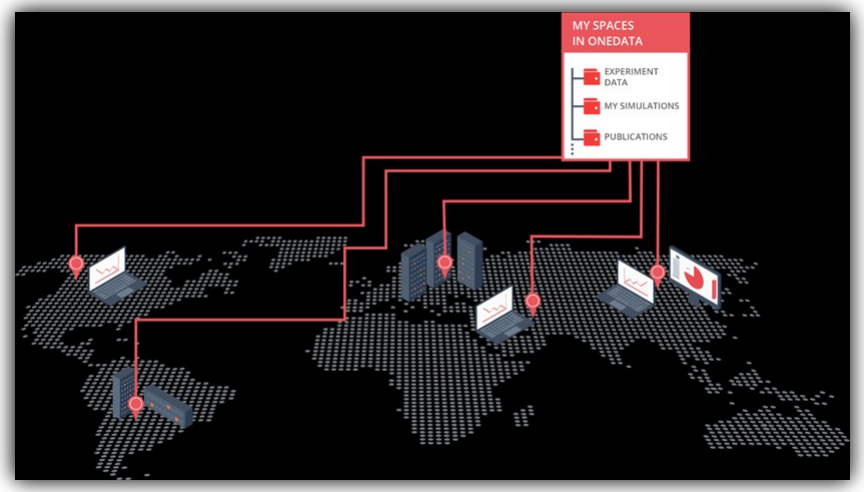
- https://www.datalad.org/
- *DataLad is a free and open-source distributed data management system that keeps track of your data, creates structure, ensures reproducibility, supports collaboration, and integrates with widely used data infrastructure.*



Tools and Resources to Support FAIR Principles

OneData

- https://onedata.org/
- *Perform heavy computations on huge datasets. Access your data in a dropbox-like fashion regardless of its location. Publish and share your results with public or closed communities.*



Where to Store Research Data

Example: Storages at MU and Recommendations for their Use

- Centrally managed by Institute of Computer Science
  - https://it.muni.cz/en/categories/data-storage
- Recommendations their use:
  - Data type categorization.
  - Storage technology categorization.
  - Matrix of suitability of different storages for different types of data.

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Example: Storages at MU – Suitability of storage for different types of data

STORAGE TYPE	USAGE			
	GREEN: PUBLIC DATA	BLUE: INTERNAL DATA	ORANGE: DISCRETE DATA	RED: SENSITIVE DATA
PORTABLE MEDIA (FLASH DRIVES, EXTERNAL HDD, CD, DVD, ...)	Appropriate	Possible Encryption recommended	Inappropriate Possible when using encryption	Inappropriate
LOCAL STORAGE				
IN COMPUTERS (DESKTOP, LAPTOPS)	Appropriate	Appropriate	Appropriate Encryption recommended	Inappropriate possible in well-justified cases, when performing an individual analysis, using encryption and applying other security measures resulting from the analysis
IN MOBILE DEVICES (MOBILE PHONES, TABLETS, ...)	Appropriate	Appropriate Screen lock required (pattern, fingerprint reader, PIN, password)	Possible Encryption required Strong screen lock required (fingerprint reader, PIN, password)	Inappropriate possible in well-justified cases, when performing an individual analysis, using encryption and applying other security measures resulting from the analysis
ICS NETWORK AND CLOUD STORAGE (SO-CALLED STANDARD AND MEDIUM NETWORK STORAGE, SEE IT CATALOGUE, CERIT-SC STORAGE)	Appropriate	Appropriate	Appropriate	Appropriate It is recommended to perform an individual analysis, use encryption and apply other security measures that result from the analysis

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Example: Storages at MU – Suitability of storage for different types of data

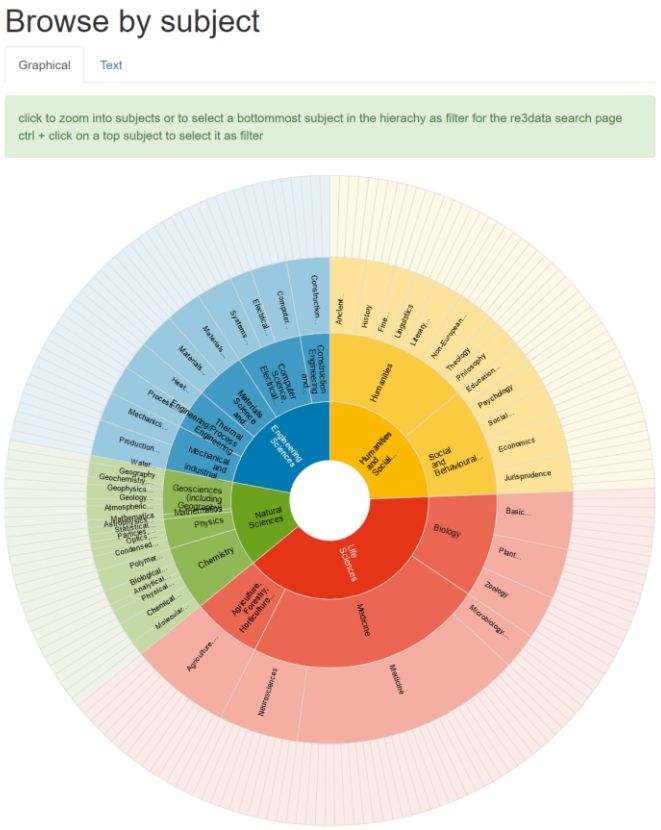
STORAGE TYPE	USAGE			
	GREEN: PUBLIC DATA	BLUE: INTERNAL DATA	ORANGE: DISCRETE DATA	RED: SENSITIVE DATA
IS MUNI REPOSITORY (E.G. DOCUMENT SERVER, FILE DEPOSITORY, ETC.)	Appropriate	Appropriate	Appropriate	Appropriate It is recommended to perform an individual analysis, use encryption and apply other security measures that result from the analysis
CESNET STORAGE (E.G. CESNET ARCHIVE STORAGE, OWNCLOUD, FILESENDER, ..., SEE CESNET DATA STORAGE DEPARTMENT)	Appropriate	Appropriate	Appropriate	Appropriate It is recommended to perform an individual analysis, use encryption and apply other security measures that result from the analysis
EXTERNAL STORAGE				
WITH A CONTRACT WITH MUNI				
MUNI MICROSOFT O365 (MUNI O365 ONEDRIVE, SHAREPOINT, ..., VIZ MUNI O365)	Appropriate	Appropriate	Appropriate Encryption recommended	Possible only with adequate procedural coverage of the situation based on an individual analysis and the application of security measures that result from the analysis
MUNI GOOGLE G SUITE FOR EDUCATION (SEE MUNI GOOGLE APPS)	Appropriate	Appropriate	Inappropriate Possible when using encryption	Inappropriate
GRAMMARLY	Appropriate	Appropriate	Inappropriate	Inappropriate
WITHOUT A CONTRACT WITH MUNI				
PUBLIC GOOGLE, MICROSOFT, DROPBOX, ... STORAGES	Appropriate	Inappropriate	Inappropriate	Inappropriate

Repositories for Research Data: Types

- Topical, national, institutional, catch-the-all, …
- A common procedure for working with research data is to divide it by disciplines, not by country or institution.
  - We do not consider national/institutional/… specifics, but research topic specifics.
- If we are dealing with a project/institutional/national standard, we must be compatible with international industry practices.
  - Industry standards are addressed by, for example, EOSC Task Forces: https://www.eosc.eu/task-force-faq

How to Find/Select a Data Repository

- Repository directories:
  - Open Access Repositories: OpenDOAR
  - Data repositories: re3data.org
- OpenAIRE: How to find a trustworthy repository for your data
  - Trusted certified repositories are preferred.
    - CoreTrustSeal (list of certified repositories).
    - Nestor Seal (verification according to DIN 31644).
    - ISO 16363.
  - For example, the well-known Zenodo has no certification…
- The most used general repositories include
  - Zenodo,
  - Figshare, or
  - Dryad.



Source: https://www.re3data.org/browse/by-subject/

What to Look Out for when Choosing a Repository

- Will the repository assign a persistent identifier (e.g. DOI) to your data?
  Persistent identifiers make your data easier to find and cite.
- Is the repository trustworthy/certified?
  With certified repositories, you can be more sure that your data is well taken care of.
- Does the selected repository provide open access to the stored data?
  If you want to share your data openly, then this is the key information.
- Will the repository license your data? Does it state clear conditions under which the data stored in the repository can be used?
  It's important that users of your data know how they can handle it.
- Will the repository provide a landing page for your data?
  Metadata will help others find the data, find out what the data is, and also how to cite it.
- Does the repository allow versioning?
  If you update your dataset, you can upload the updated version as a new version to the original dataset. The new dataset is assigned its own persistent identifier and users can easily find out what the latest version is or which version was used in the original study.

Persistent Identifiers (PIDs)

Persistent Identifiers (PIDs)

- They are supposed to ensure the separation of the identification of the object as such,
  - person,
  - institution,
  - publication,
  - dataset,
- from its current physical location.

- Example – dataset *https-set*
  - Dataset identifier: https://doi.org/10.48791/4mxp-r725
  - Current physical location: https://ucnmuni.sharepoint.com/teams/mu-UVT-https-set/Shared%20Documents/Forms/AllItems.aspx?id=%2Fteams%2Fmu%2DUVT%2Dhttps%2Dset%2FShared%20Documents%2Fhttps%2Dset%2Dv1%2E0%2E0&p=true&ga=1
  - The physical location is likely to change in the future – a move to the National catch-all data repository, is being considered.
  - Changes don't matter – users are *always* presented with a link to the data being DOI 10.48791/4mxp-r725, which always takes them to the current location.

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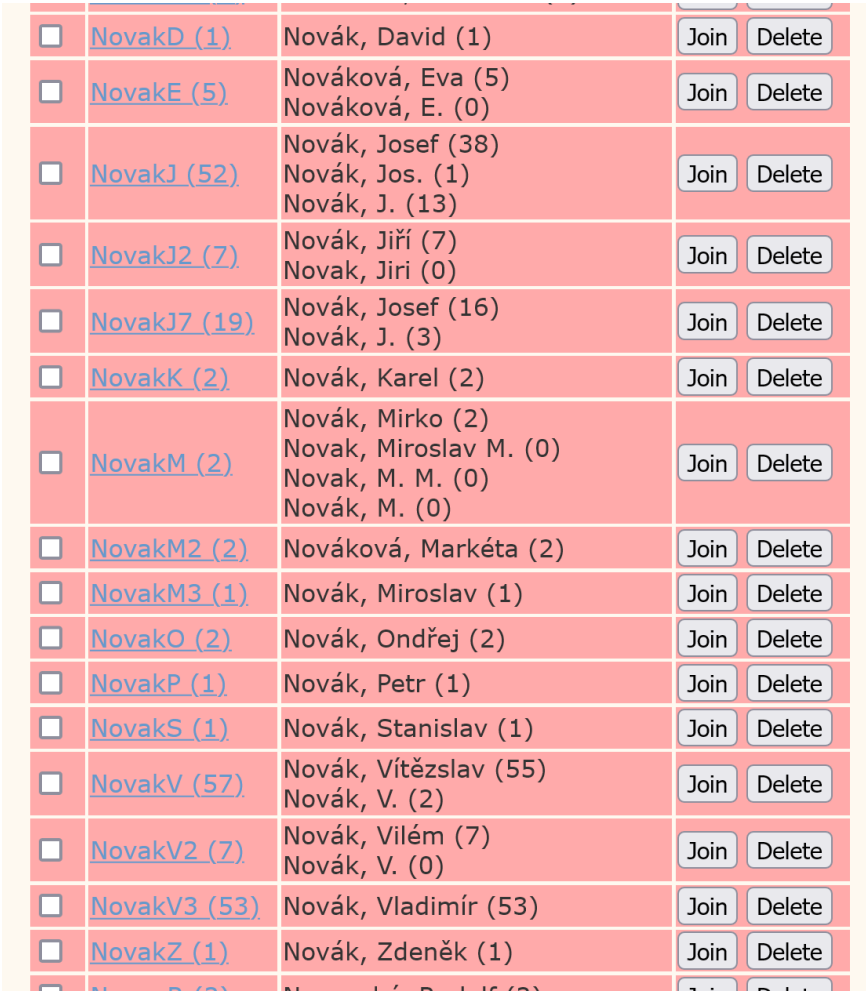
Persistent Identifiers (PIDs)

- They are intended to ensure clarity.
- Example – names of natural persons:
  - Multiple forms of writing the name of one physical person.
  - Multiple different individuals with the same name.
- They are intended to ensure persistence.
  - Metadata physically located with a third party, independent of the physical location of the referenced entity.
- The identifier's owner takes care of updating the metadata and updating the route to the current location.
- The third party is responsible for preserving the latest version and history of the metadata and the existence of the identifier itself, even if the owner of the identifier stops caring for it. And even if the identified entity is not retained as such.



☐	NovakD (1)	Novák, David (1)	Join Delete
☐	NovakE (5)	Nováková, Eva (5) Nováková, E. (0)	Join Delete
☐	NovakJ (52)	Novák, Josef (38) Novák, Jos. (1) Novák, J. (13)	Join Delete
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☐	NovakS (1)	Novák, Stanislav (1)	Join Delete
☐	NovakV (57)	Novák, Vítězslav (55) Novák, V. (2)	Join Delete
☐	NovakV2 (7)	Novák, Vilém (7) Novák, V. (0)	Join Delete
☐	NovakV3 (53)	Novák, Vladimír (53)	Join Delete
☐	NovakZ (1)	Novák, Zdeněk (1)	Join Delete

Source: Authors' database of the project DML-CZ

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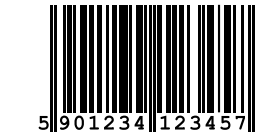
Popular PIDs

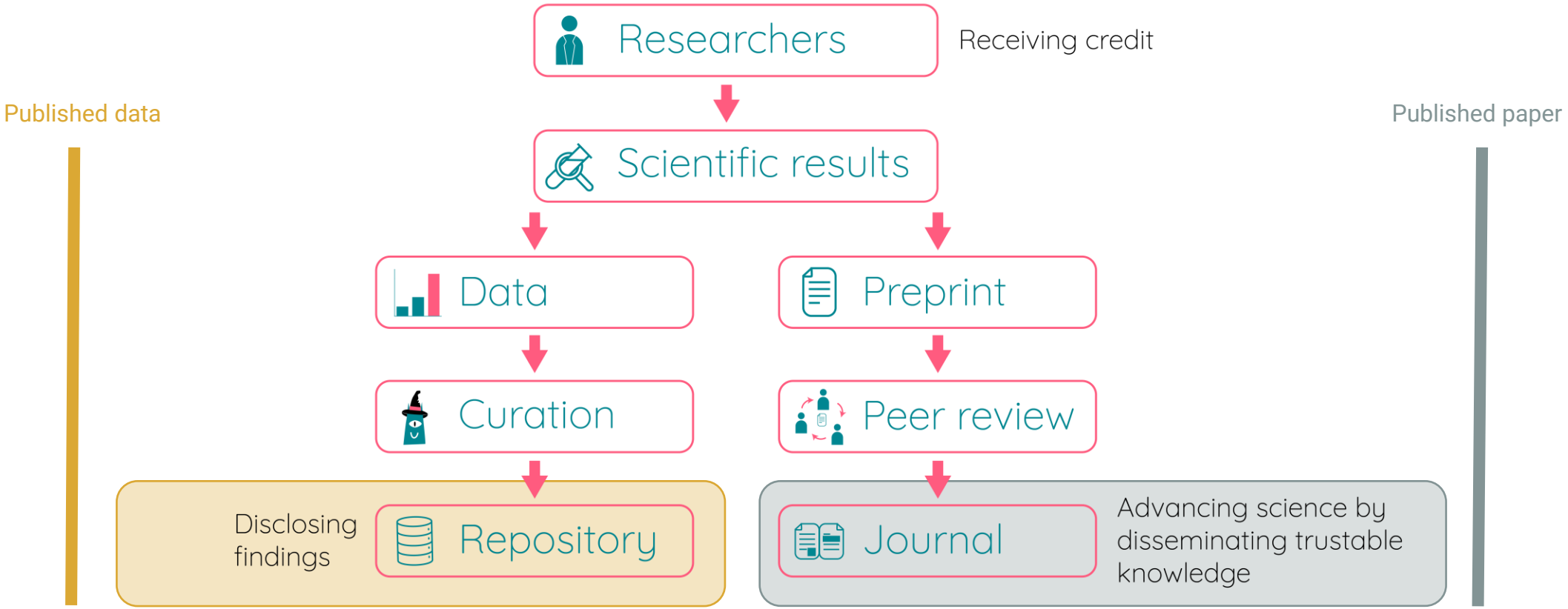
- People
  - **ORCID**: https://orcid.org/
    - Example: **0000-0001-6399-5453**
- Institutions
  - **ROR**: https://ror.org/
    - Example: **02j46qs45**
- Publications
  - **DOI**: https://www.crossref.org/
    - Example: **10.5817/CP2022-3-1**
- Datasets
  - **DOI**: https://datacite.org/
    - Example: **10.48791/4mxp-r725**
  - **Handle**: https://handle.net/
    - Example: **11222.digilib/130328**
- Books
  - **ISBN**: https://www.isbn-international.org/
    - Example: **978-3-16-148410-0**
- Journals
  - **ISSN**: http://portal.issn.org/
    - Example: **0378-5955**
- Business articles
  - **EAN13**: https://www.gs1.org/standards/barcodes/ean-upc
    - Example: **5901234123457**



- Inhabitants of the Czech Republic
  - **Birth Number** (~Social Security Number): https://www.zakonyprolidi.cz/cs/2004-302/
    - Example: **736028/5163**

European Open Science Cloud (EOSC)

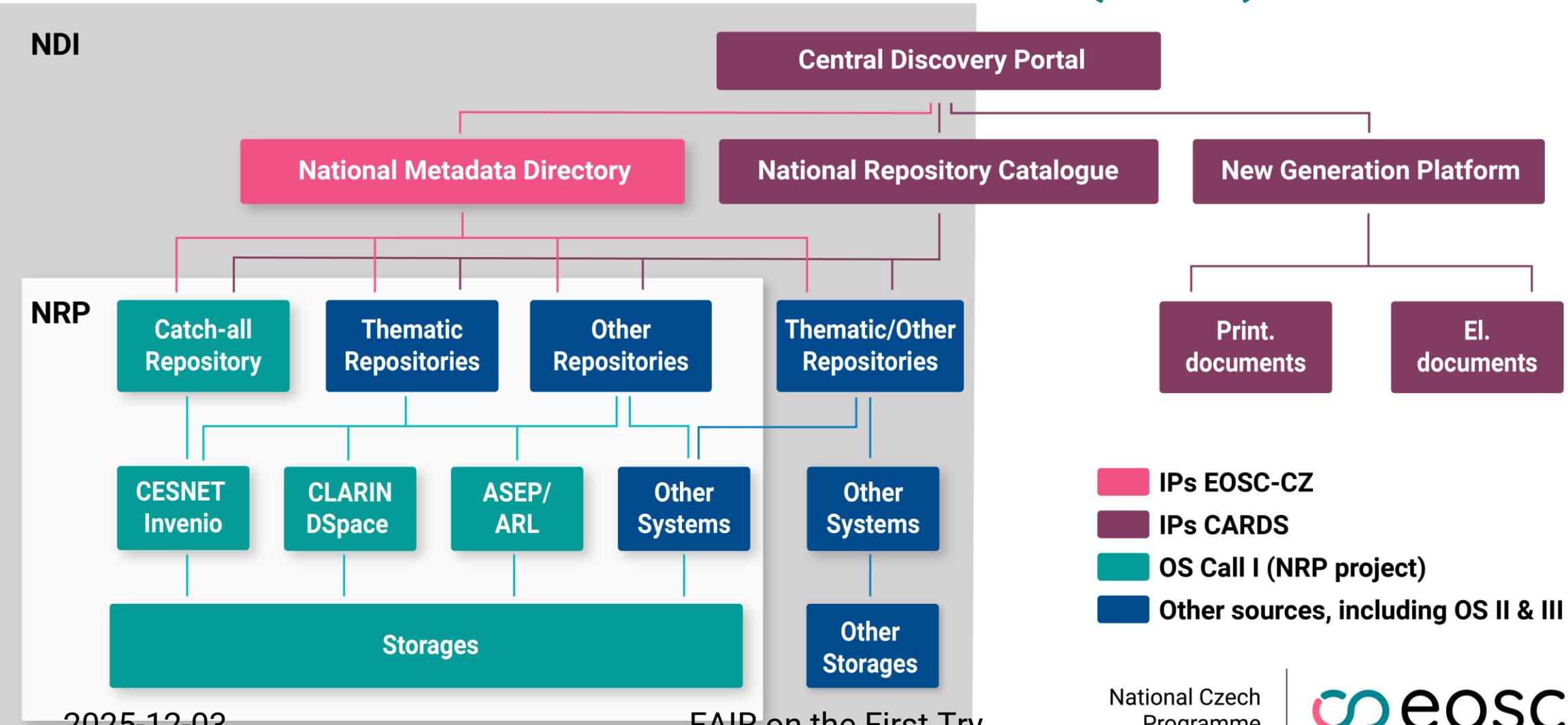
Peer reviewed research



This ALSO is a figurative checkmark in your career

This is a figurative checkmark in your career

National Data Infrastructure (NDI)



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NDI Outputs: Storage Capacities

Repositories

- Catch-all repository (2025)
- **Thematic (domain-specific) repositories**

  4 pilots: Molecular Biophysics Database*, National Repository for Biodiversity Data, Repository for Biological Imaging Data, ArchaeoVault (end of 2025)
  - Others from 2025/2026
- National Metadata Directory

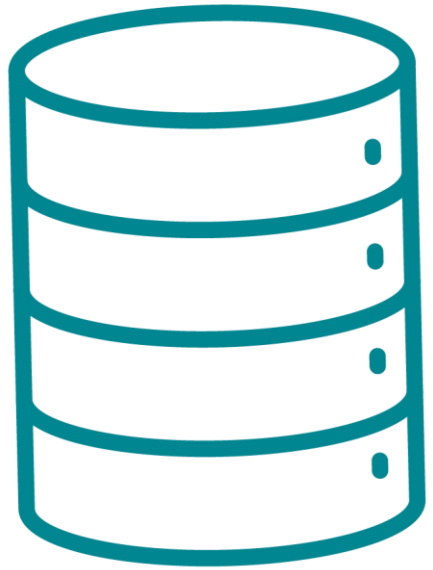
Repository systems

- CESNET Invenio, CLARIN-DSpace, ASEP-ARL

Hardware

- Physical, distributed storage infrastructure
- Total of 50+ PB of user data storage capacity

https://mbdb-data.org/



* in production mode already

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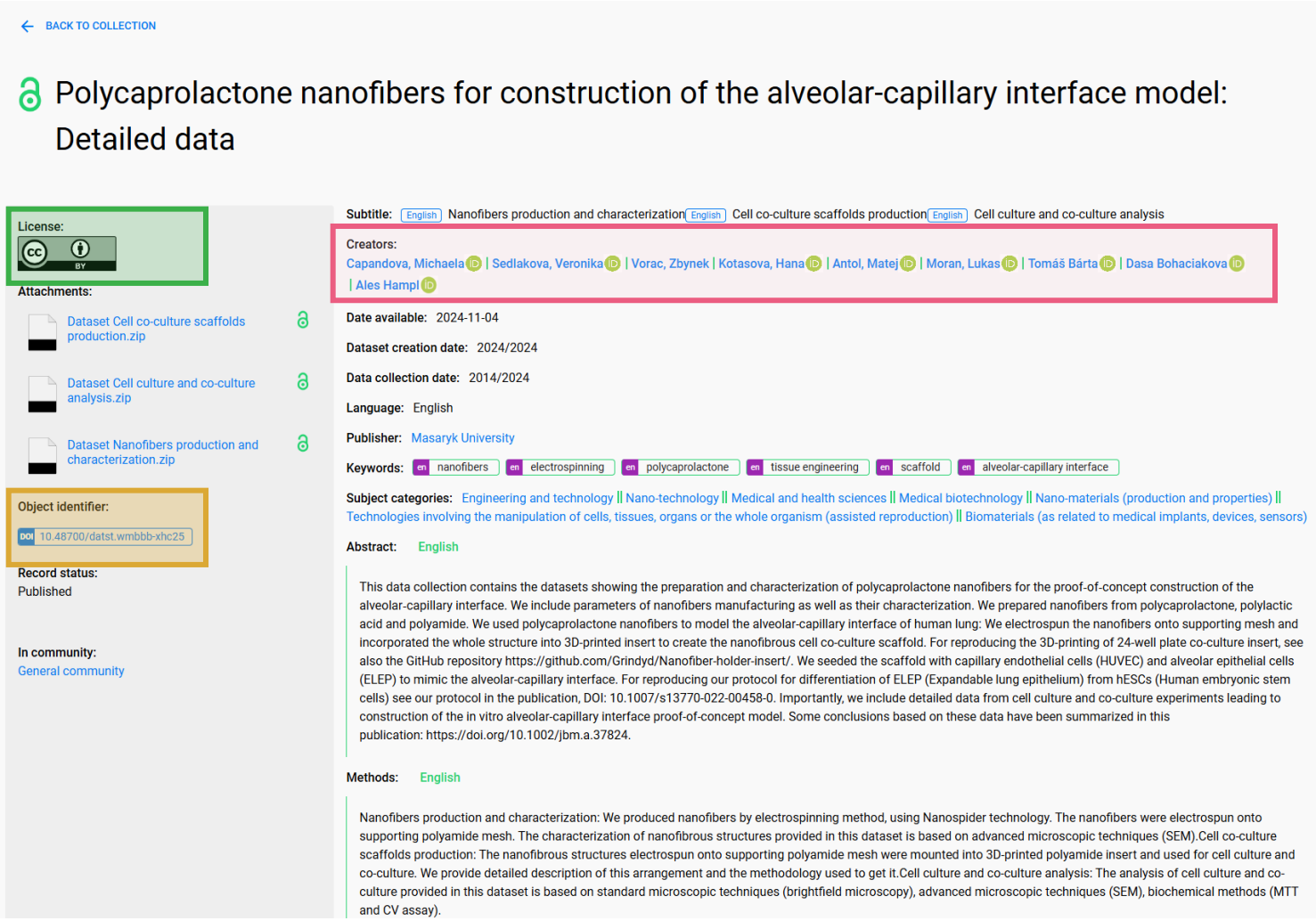
AI-ready (Valuable) Data



BACK TO COLLECTION

Polycaprolactone nanofibers for construction of the alveolar-capillary interface model: Detailed data

License: CC BY

Attachments:
- Dataset Cell co-culture scaffolds production.zip
- Dataset Cell culture and co-culture analysis.zip
- Dataset Nanofibers production and characterization.zip

Object identifier: DOI 10.48700/datst.wmbbb-xhc25

Record status: Published

In community: General community

Subtitle: English Nanofibers production and characterization English Cell co-culture scaffolds production English Cell culture and co-culture analysis

Creators: Capandova, Michaela | Sedlakova, Veronika | Vorac, Zbynek | Kotasova, Hana | Antol, Matej | Moran, Lukas | Tomáš Bárta | Dasa Bohaciakova | Ales Hampl

Date available: 2024-11-04

Dataset creation date: 2024/2024

Data collection date: 2014/2024

Language: English

Publisher: Masaryk University

Keywords: en nanofibers en electrospinning en polycaprolactone en tissue engineering en scaffold en alveolar-capillary interface

Subject categories: Engineering and technology || Nano-technology || Medical and health sciences || Medical biotechnology || Nano-materials (production and properties) || Technologies involving the manipulation of cells, tissues, organs or the whole organism (assisted reproduction) || Biomaterials (as related to medical implants, devices, sensors)

Abstract: English

This data collection contains the datasets showing the preparation and characterization of polycaprolactone nanofibers for the proof-of-concept construction of the alveolar-capillary interface. We include parameters of nanofibers manufacturing as well as their characterization. We prepared nanofibers from polycaprolactone, polylactic acid and polyamide. We used polycaprolactone nanofibers to model the alveolar-capillary interface of human lung: We electrospun the nanofibers onto supporting mesh and incorporated the whole structure into 3D-printed insert to create the nanofibrous cell co-culture scaffold. For reproducing the 3D-printing of 24-well plate co-culture insert, see also the GitHub repository https://github.com/Grindyd/Nanofiber-holder-insert/. We seeded the scaffold with capillary endothelial cells (HUVEC) and alveolar epithelial cells (ELEP) to mimic the alveolar-capillary interface. For reproducing our protocol for differentiation of ELEP (Expandable lung epithelium) from hESCs (Human embryonic stem cells) see our protocol in the publication, DOI: 10.1007/s13770-022-00458-0. Importantly, we include detailed data from cell culture and co-culture experiments leading to construction of the in vitro alveolar-capillary interface proof-of-concept model. Some conclusions based on these data have been summarized in this publication: https://doi.org/10.1002/jbm.a.37824.

Methods: English

Nanofibers production and characterization: We produced nanofibers by electrospinning method, using Nanospider technology. The nanofibers were electrospun onto supporting polyamide mesh. The characterization of nanofibrous structures provided in this dataset is based on advanced microscopic techniques (SEM).Cell co-culture scaffolds production: The nanofibrous structures electrospun onto supporting polyamide mesh were mounted into 3D-printed polyamide insert and used for cell culture and co-culture. We provide detailed description of this arrangement and the methodology used to get it.Cell culture and co-culture analysis: The analysis of cell culture and co-culture provided in this dataset is based on standard microscopic techniques (brightfield microscopy), advanced microscopic techniques (SEM), biochemical methods (MTT and CV assay).

Your (author)

Citable (DOI) + **F**indable

Accessible + **I**nteroperable

Reusable (licence)

Machine actionable (metadata)

= AI-ready record (dataset)

VALUABLE SCIENTIFIC RESULT

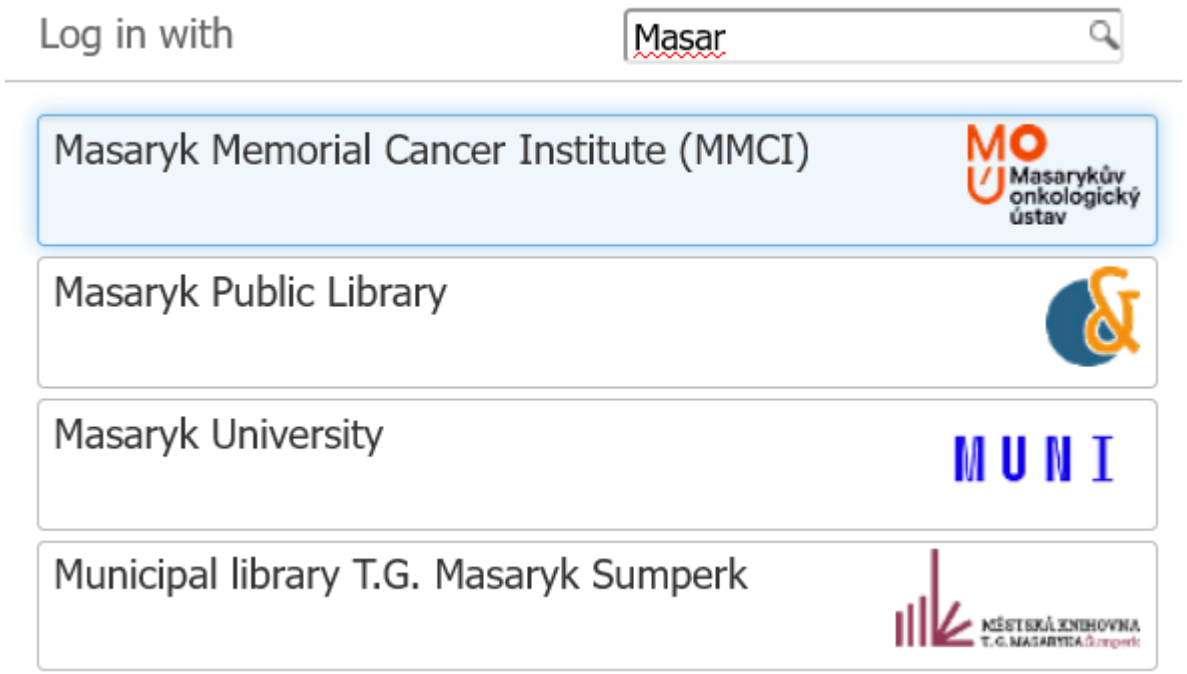

ARTS
AGROFOOD
AI
CORPUS
GENASIS
OMICS
ZOOLOGY
SIMULATIONS
SENSORS
DUNE
ARCHAEO-LOGY
BIOIMAGING
CZECH DATA REPOSITORIES
SOLAR
PLANTS
MAPS AND DATA
LINGUISTICS
ISOARCH
SOCIAL
FUNGI
SENSITIVE SOCIAL DATA
MOLECULAR BIOPHYSICS
BIO/CHEM
OBSERVA-TORY
ARCHAEO-VAULT
IMAGING
ARCHAEO-MAPS
BIODIVER-SITY
CRYSTALO-GRAPHY
PLASMA
PHENOTYPE
LASER PHYSICS
LAUEDB
MATERIALS
EXPOSOME
TELESCOPE
BIBLIO-GRAPHY
BIOPHYSICS
BIOMONI-TORING
REPO CZ

NDI Outputs: Tools and Services

- Support for data management planning (DMP).
- Metadata profile management.
- Support for license handling.
- Support for working with persistent identifiers.
- Support for FAIRification of research data.
- Automation of data collection.
- Electronic laboratory notebooks.
- Overall cybersecurity and system compliance.

Data Access Control

- FAIR Data, “As open as possible, as closed as necessary”.
  - We need precise access control to data, metadata, services.
- Federative system – use your institutional identity, your well-known authentication web page.
  - Effective collaboration across institutions, individuals, …



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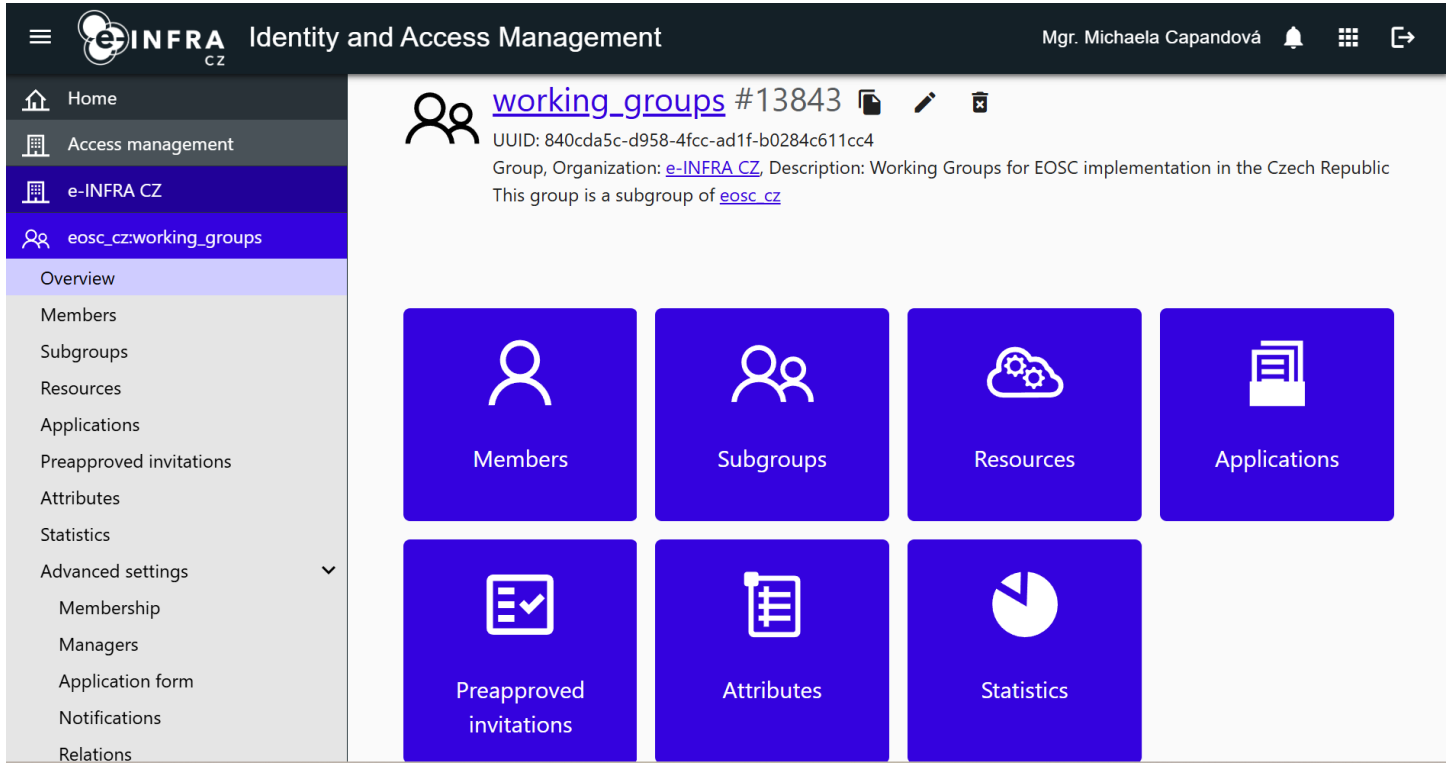
Authentication and Authorization Infrastructure

Enabling users from different institutions to easily access data and services.



- Access and identity management
- Group and role management
- Permission assignment

https://perun-aai.org/

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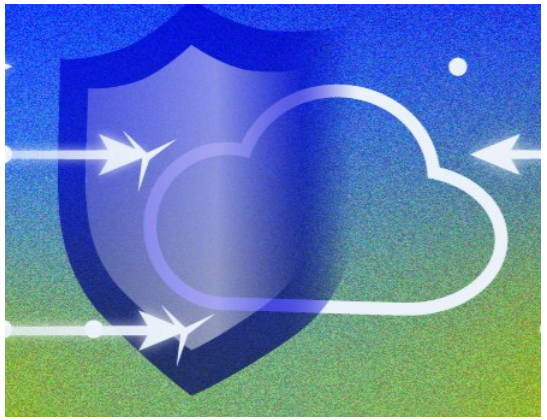
SensitiveCloud



SensitiveCloud

Secure environment for storing, sharing and processing sensitive data.

- Primarily designed for work with your own sensitive data.
- Gradually extended to support controlled data sharing.
  - Main technical component for handling sensitive data within NDI.
- Includes storage, computing resources and support for ready-to-use web applications.

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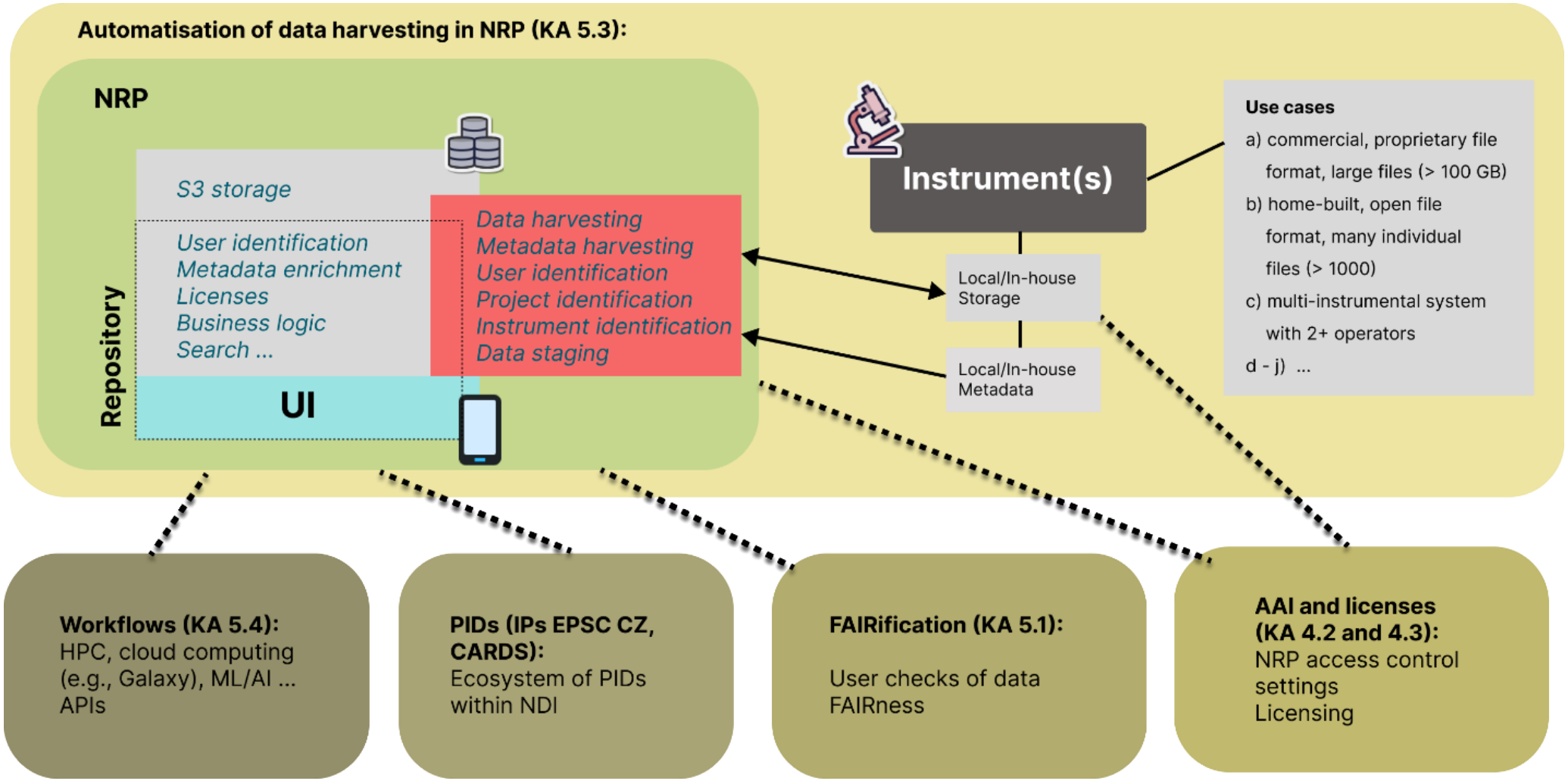
Automation of Data and Metadata Collection

FAIR: **A**ccessible, **I**nteroperable, **R**eusable



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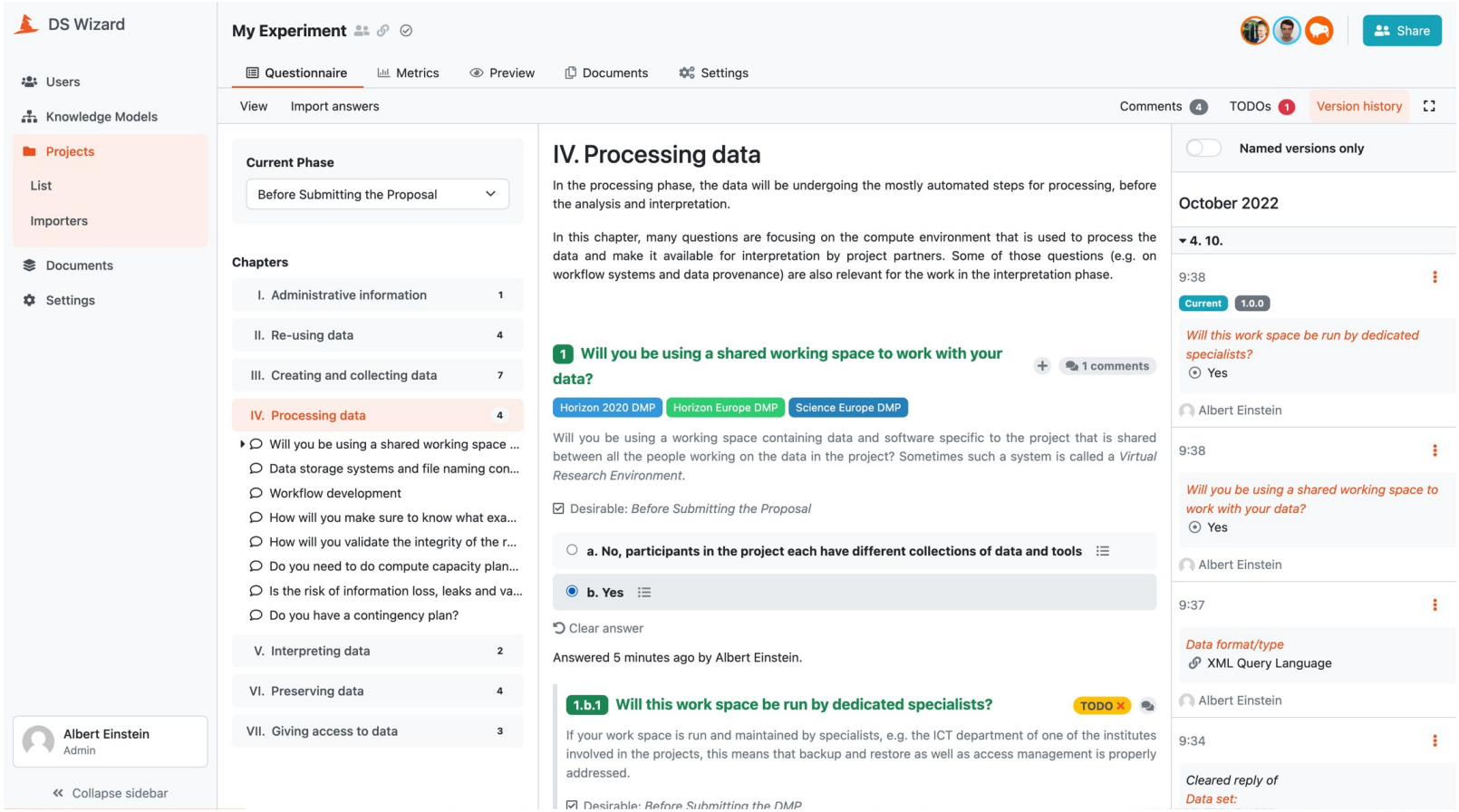
Support for Data Management Planning

- We expect integration of tools like Data Stewardship Wizard (DSW) directly to the platform.
  - https://dmp.eosc.cz/
- Integration allows effective re-use of available (meta)data.



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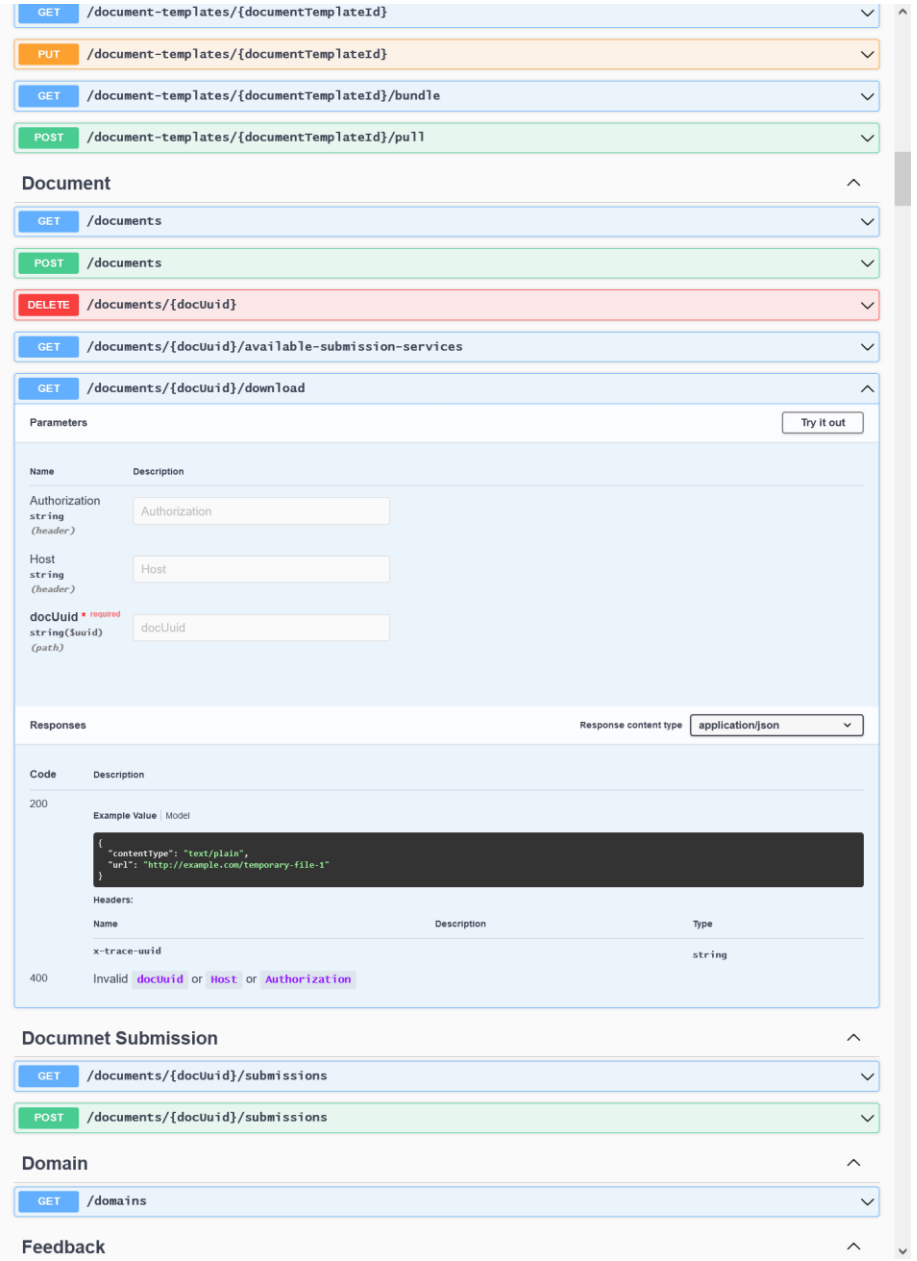
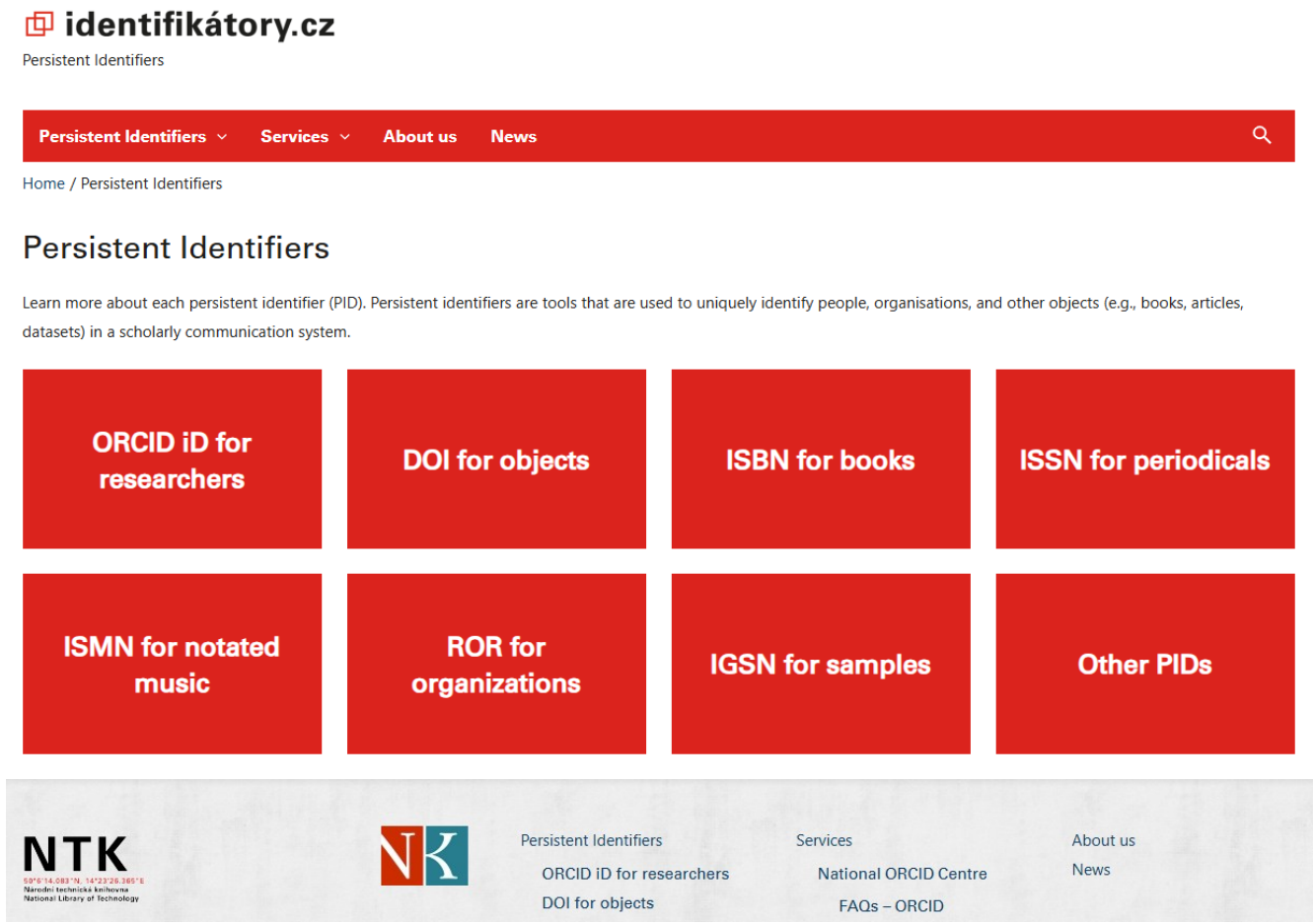
FAIR: Findable, Accessible, Interoperable

Machine-Actionable

- Automate as much as possible.
  - API and machine-readability for data and metadata.
- As much as possible read from metadata of the datasets, from infrastructure configuration, …



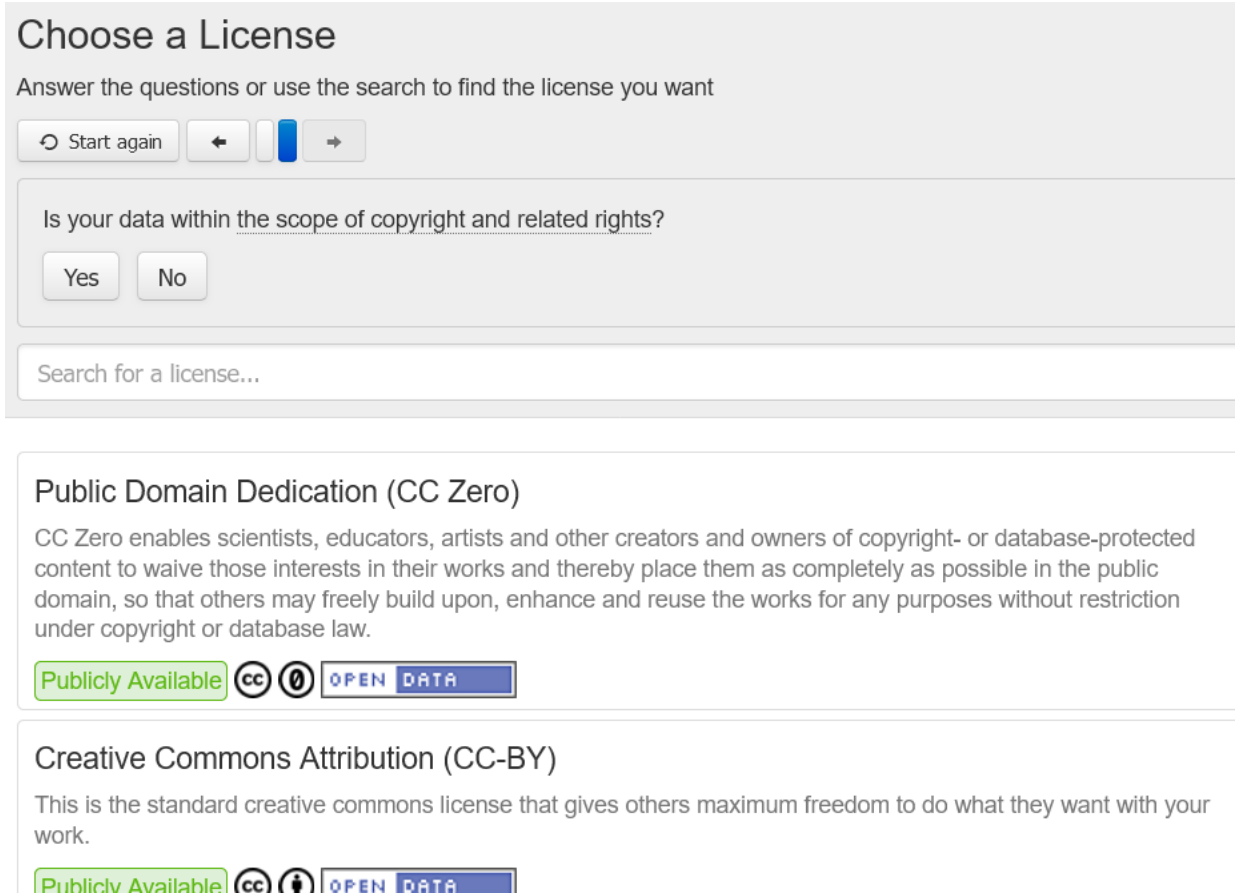
Persistent Identifiers



https://identifikatory.cz/en/

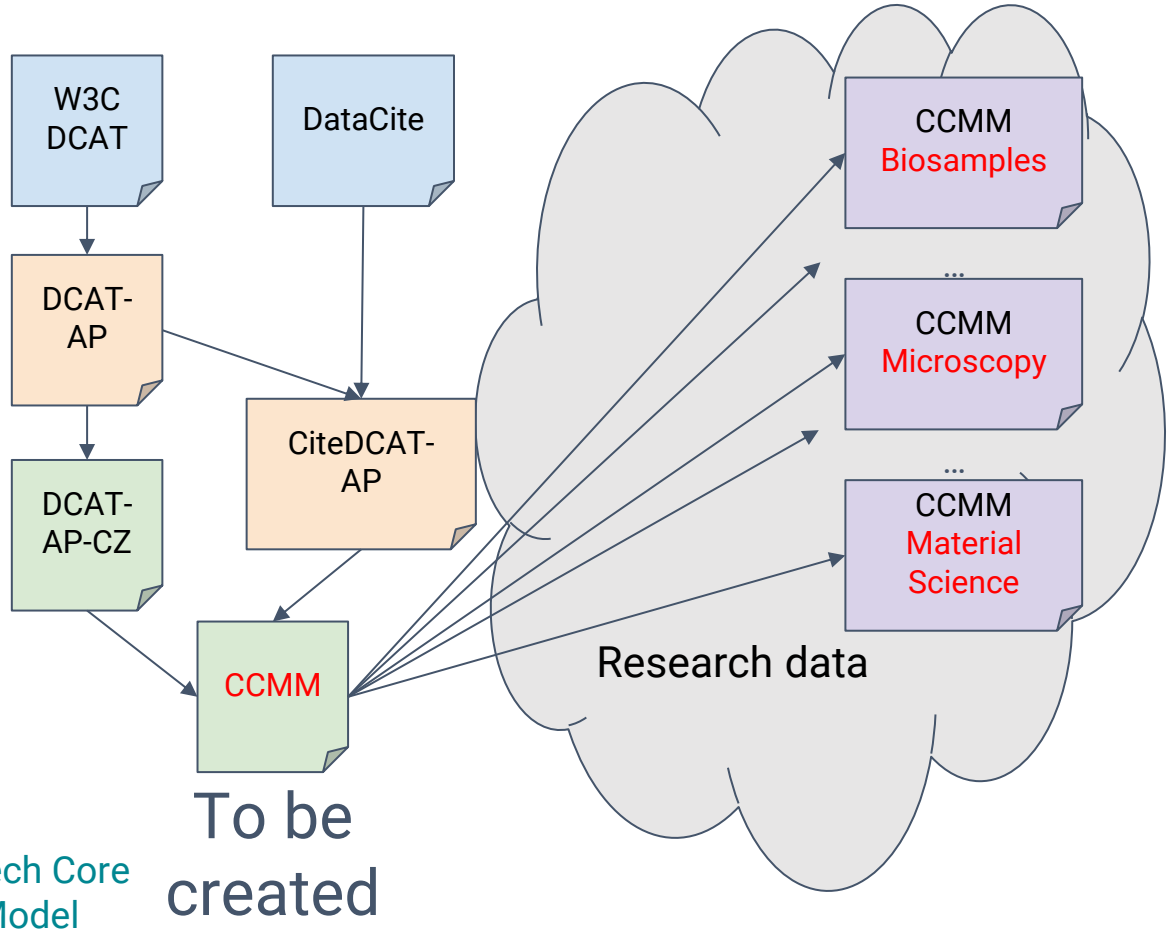
Support Work with Licenses

- Templates of deposition licenses governing the rules for upload of datasets to repositories.
- License chooser for users‘ datasets on upload.
- Framework for dataset‘s license-based access control to dataset with limited access.
- Integration and machine actionability.
  - Connection to data management, access control, …



Managing Metadata Profiles in NRP

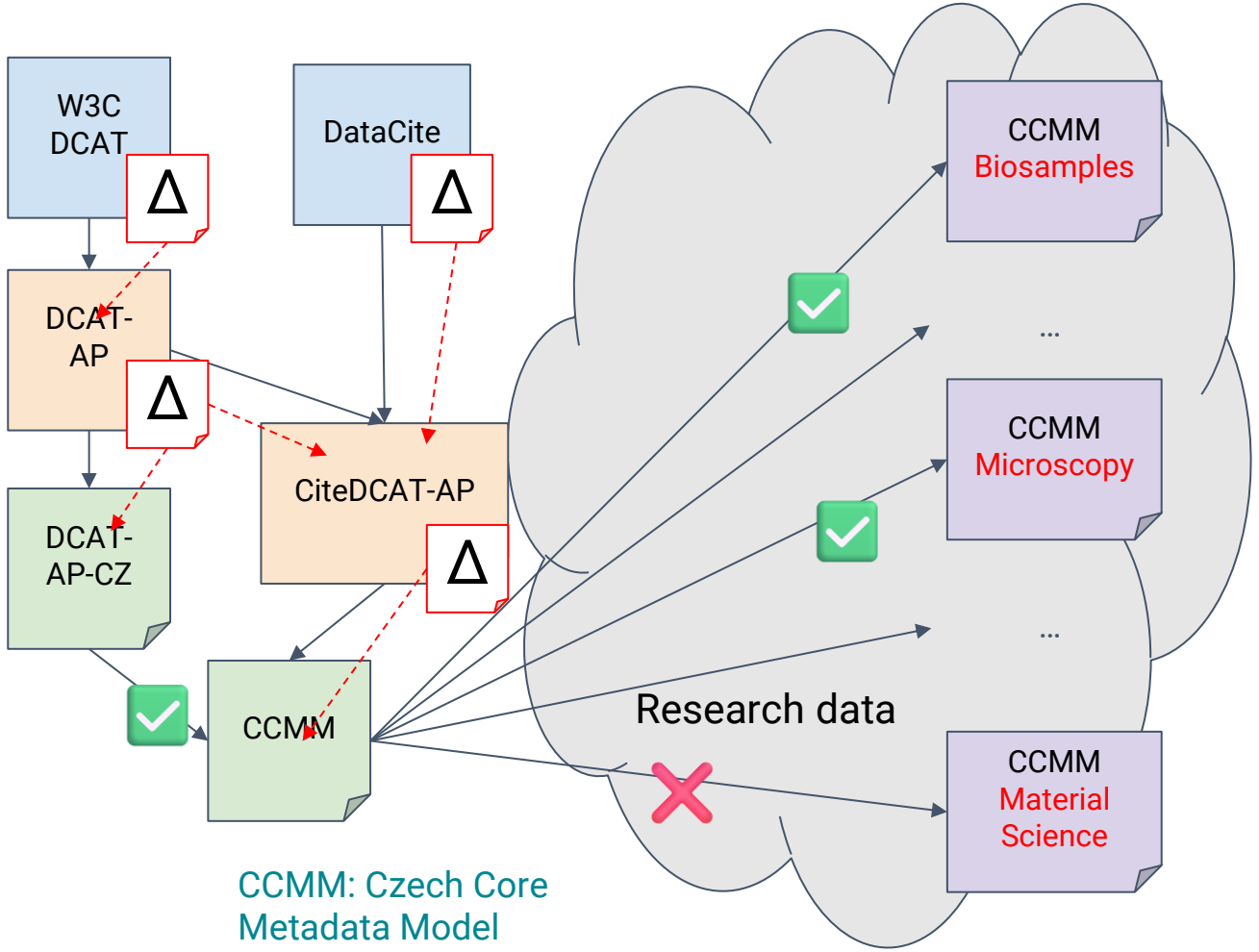
- https://dataspecer.com/
- Research data metadata profiles:
  - What happens, when
    - DCAT v2 → DCAT v3?
    - DCAT-AP v2.1.1 → DCAT-AP 3.0.1?
    - DataCite 4.4 → DataCite 4.5?
- We want changes to be propagated automatically.



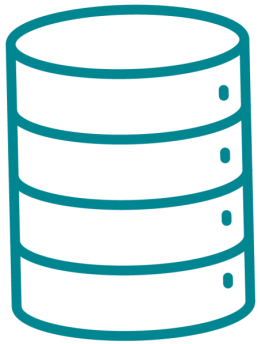
CCMM: Czech Core Metadata Model

Managing Metadata Profiles in NRP

- https://dataspecer.com/
- But also
  - profile compliance validation (✅ ❌),
  - description of changes in specifications (Δ),
  - change propagation mechanism (⇢),
  - implementation in tools.



NDI Outputs: Summary



Storage capacities

Tools and services

Computing capacities

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Useful Links and Contacts

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EOSC CZ Newsletter

- Any questions?
  - info@eosc.cz
- Ideas for a lecture or a training?
  - events@eosc.cz
- Get in touch with our PR
  - pr@eosc.cz

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