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# EOSC CZ for Researchers

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CEITEC MAFIL FAIR Data Management Workshop
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MINISTRY OF EDUCATION, YOUTH AND SPORTS

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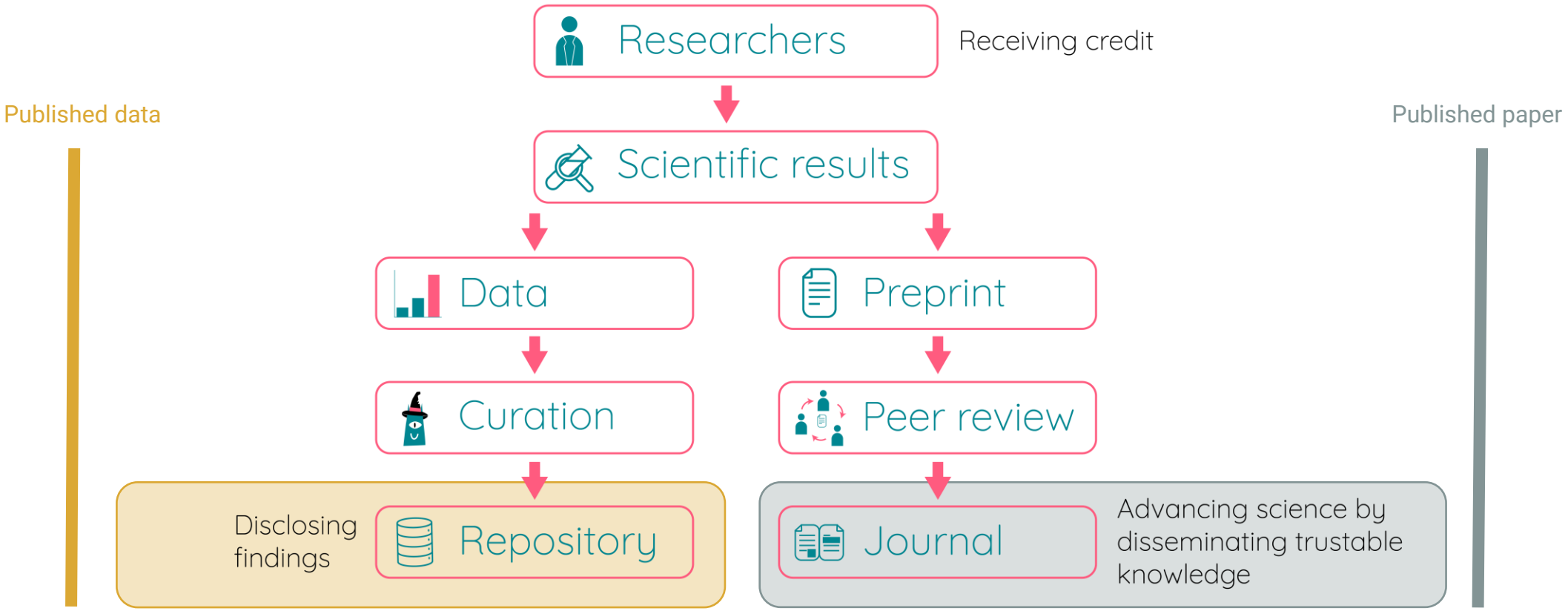
# About Me

- 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.


# European Open Science Cloud (EOSC)

# Peer reviewed research

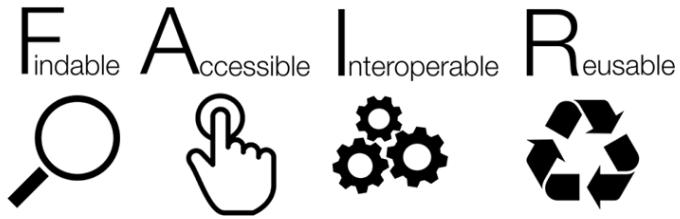


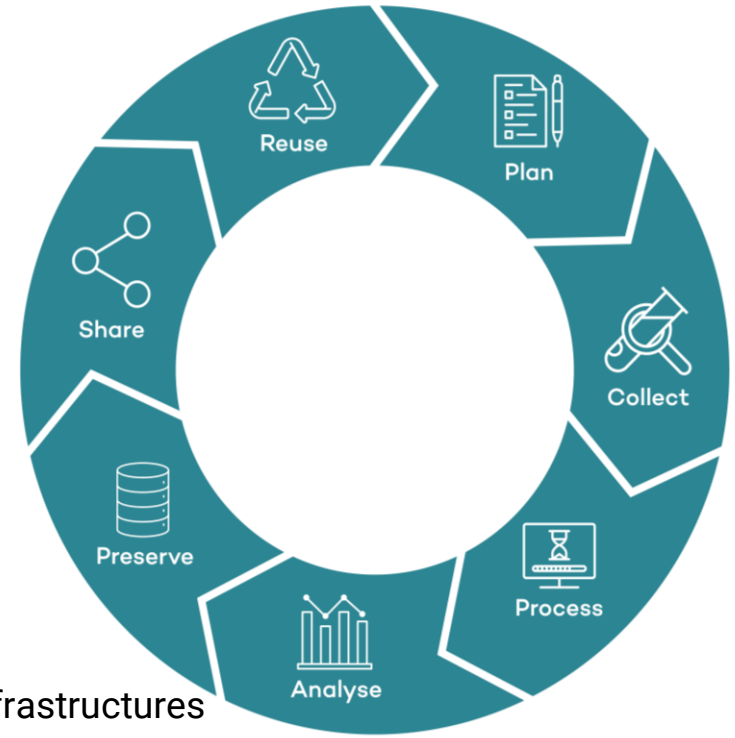

This ALSO is a figurative checkmark in your career

This is a figurative checkmark in your career

# EOSC Initiative in the Czech Republic

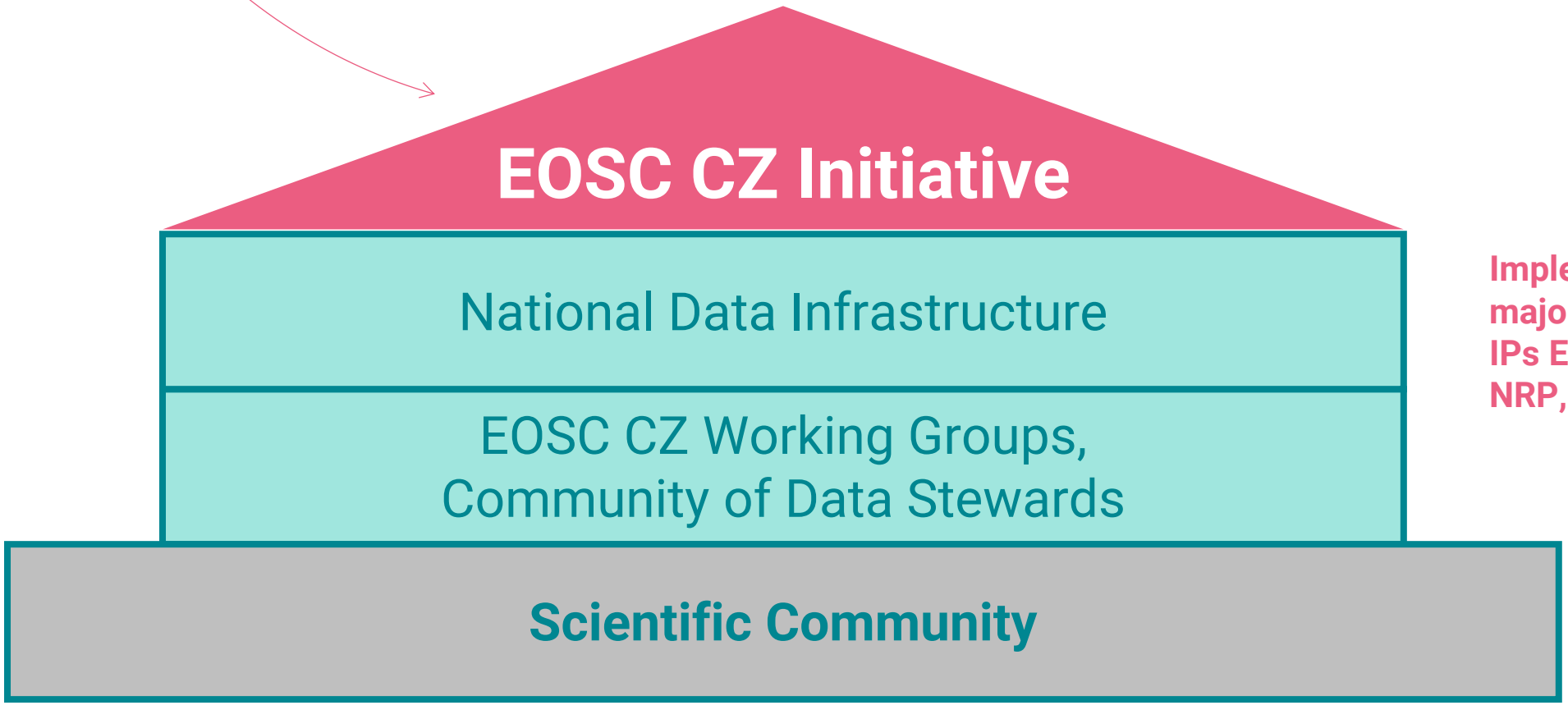
- The main output is the National Data Infrastructure.
  - A common platform for sharing, managing and accessing data and computing resources.
  - Support of scientific and multidisciplinary research activities across scientific disciplines and disciplines.




- Primarily **Preserve, Share, Reuse**
- **Plan** and **Collect** is a matter of research
- **Process** and **Analyse** is related to (e-)infrastructures

# FAIR Data Support in Czech Republic




**Implementation through major national projects – IPs EOSC-CZ, CARDS, NRP,...**

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# Researchers Are Building Facilities for Researchers

National Data Infrastructure (NDI) Architecture

Metadata

Core Services

Education and Human Resources

Bio/Health/Food

Materials Sciences and Engineering

Data Management for Artificial Intelligence and Machine Learning

Social Sciences

Physical Sciences

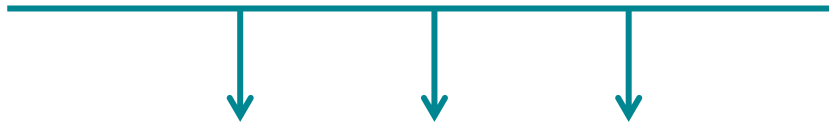
Humanities and the Arts

Environmental Sciences

Sensitive Data

## EOSC CZ Working Groups

- EOSC main community
- 4 cross-cutting: inputs to the NRP
- 8 sectoral: prerequisites for OS II
- open to anyone interested (accepts new members at any time)



**An open platform for implementing EOSC**

# Researchers Are Building Facilities for Researchers

**Controlled Vocabularies and Ontologies in the NRP/NDI**

The Task Force on Controlled Vocabularies in the NRP/NDI originated from an initiative of the National Technical Library – specifically the Centre for Repositories and Metadata Management. The aim of the Task Force is to develop a methodology for working with controlled vocabularies and ontologies within the NRP/NDI, describing the process from the selection of a controlled vocabulary by a domain repository to its registration in the National Repository Catalogue.

**It is possible to create your own task force**

If you are interested, please contact

info@eosc.cz

## Task Forces EOSC CZ

- Topics relevant to a wide range of research communities.
- Specific goals, max. 1 year.
- Membership is subject to the approval of the TF leader.
- The condition is membership in a PS.

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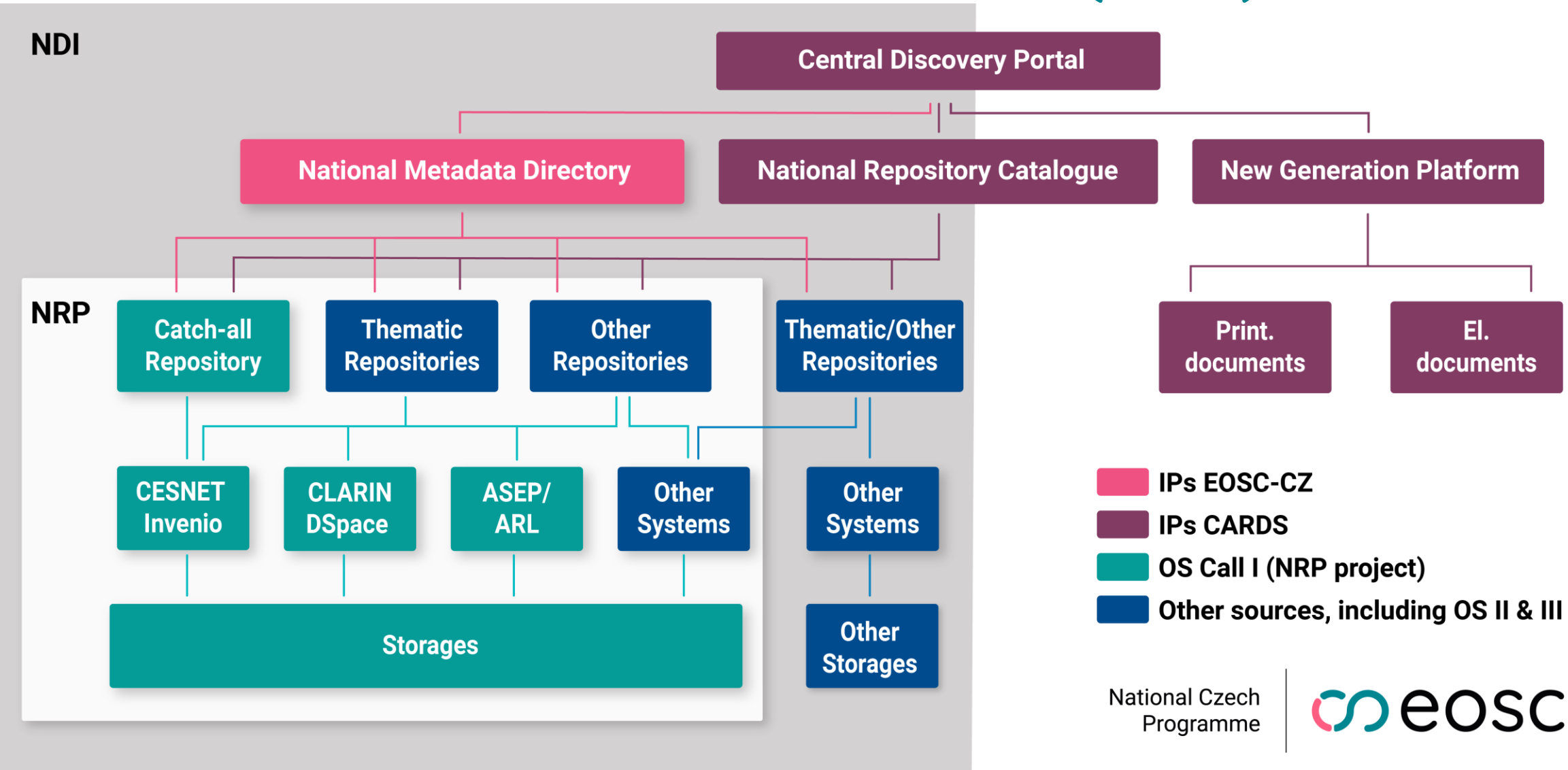
# Infrastructure for Research Data in the Czech Republic

**Available today (or very soon) free of charge for all scientists in the Czech Republic:**

1. National Data Infrastructure (NDI)
2. Data repositories
3. Data management tools and services
4. Training and materials for research data management
5. Professional support in the form of a data steward and other professional roles (also with the support of OS III)

# National Data Infrastructure (NDI)



# CZECH DATA REPOSITORIES

ARTS

AGROFOOD

AI

CORPUS

GENASIS

OMICS

ZOOLOGY

SIMULATIONS

SENSORS

DUNE

ARCHAEO-LOGY

BIOIMAGING

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

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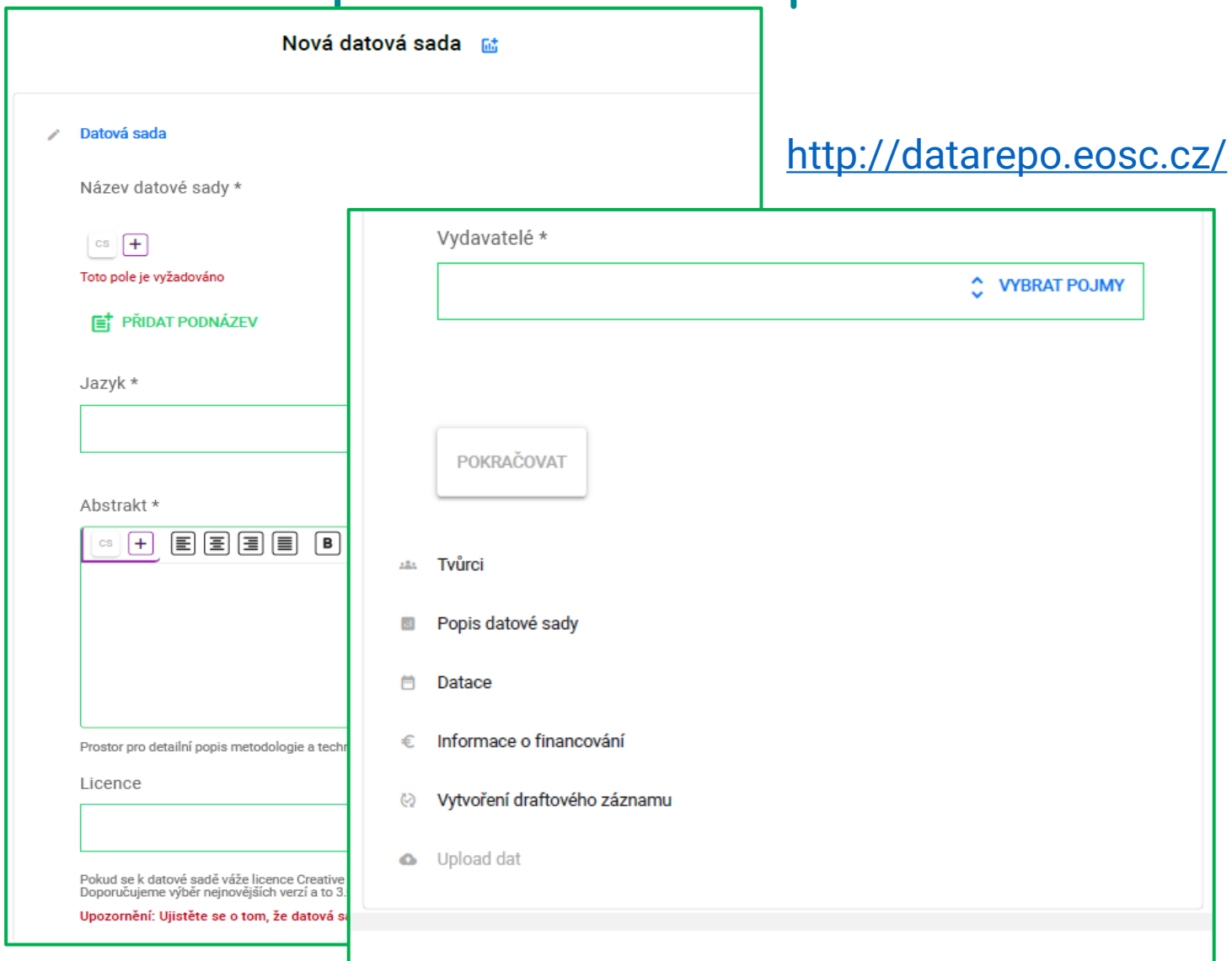
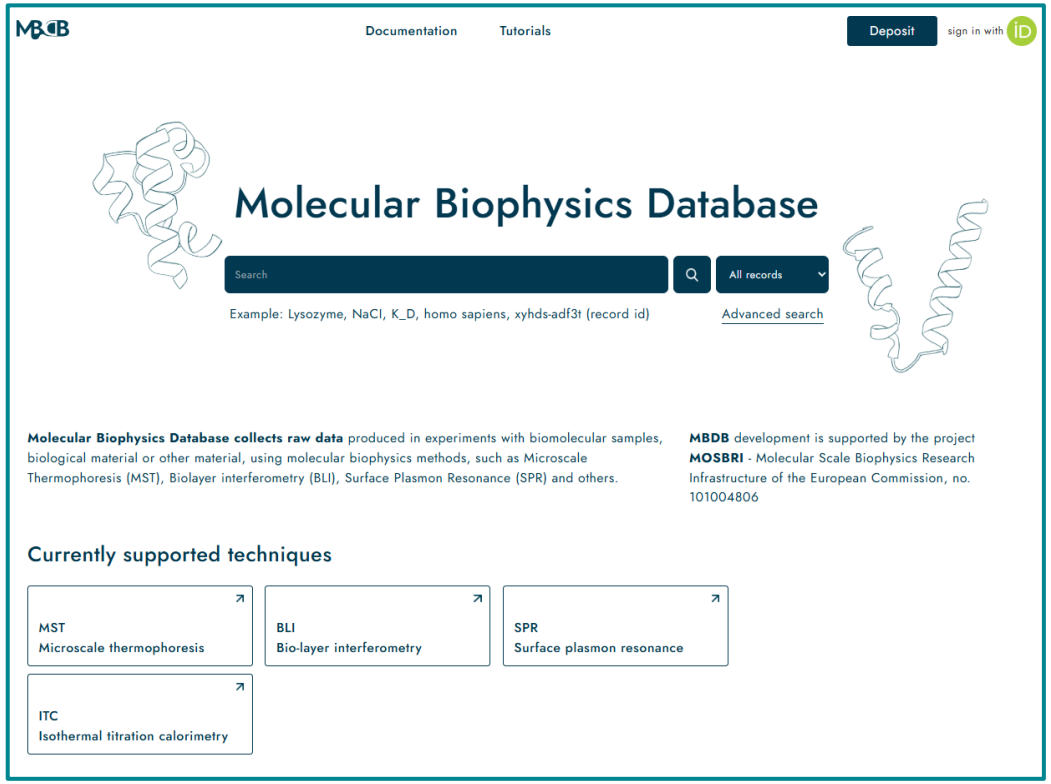
# Examples of Repositories




http://datarepo.eosc.cz/




https://mbdb-data.org/

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# NDI Outputs: Storage Capacities

## Repositories

- Catch-all repository
- **Thematic (domain-specific) repositories**
  4 pilots: Molecular Biophysics Database*, National Repository for Biodiversity Data, Repository for Biological Imaging Data, ArchaeoVault
- National Metadata Directory

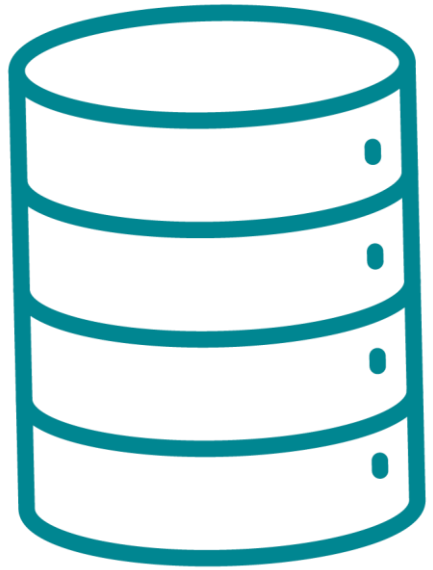
## Repository systems

- 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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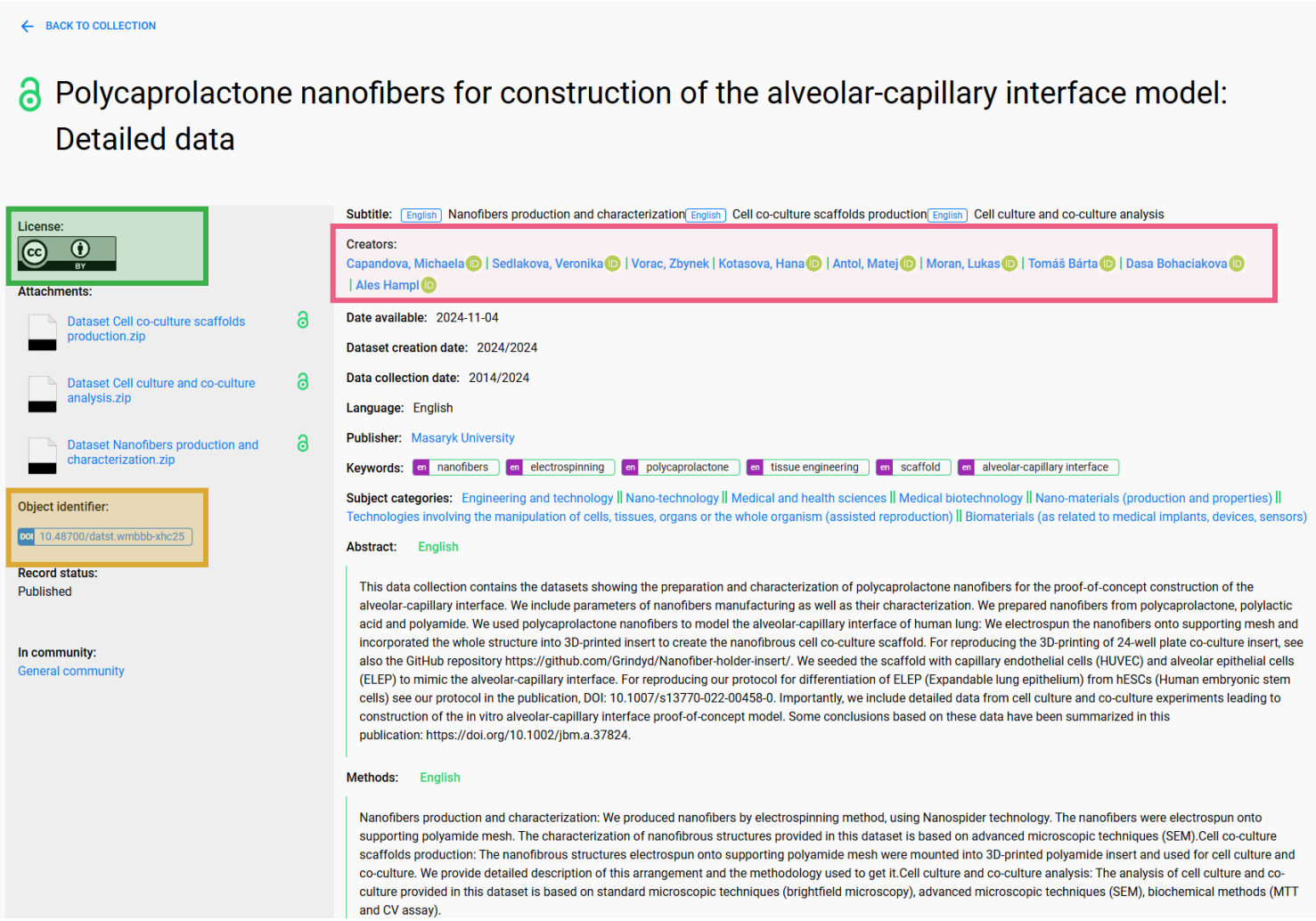
# AI-ready (Valuable) Data



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

**A**ccessible + **I**nteroperable

**R**eusable (licence)

Machine actionable (metadata)

= AI-ready record (dataset)

**VALUABLE SCIENTIFIC RESULT**

# 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.

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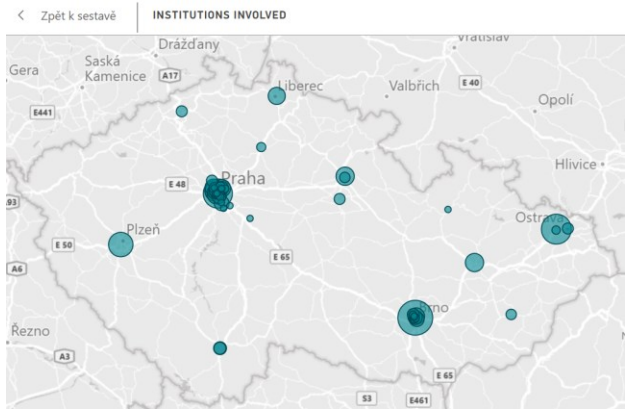
# Education – EOSC CZ Training Center

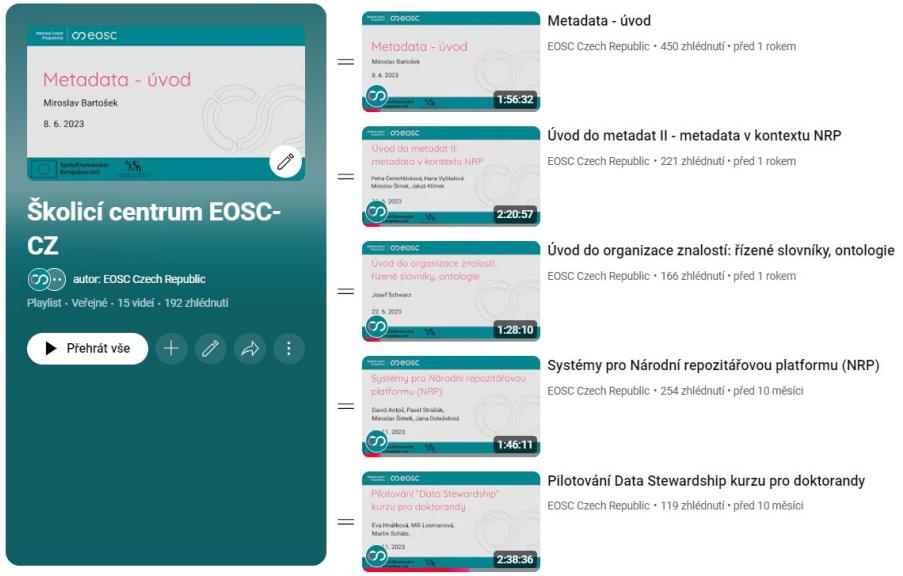
In total since the beginning of the project:

- **40 training sessions – 4000 participants**
- **4 conferences – 509 (on-site) participants**

The training is attended by scientists and academics from all parts of the country...

More at https://www.eosc.cz/skoleni, including recordings of passed trainings.



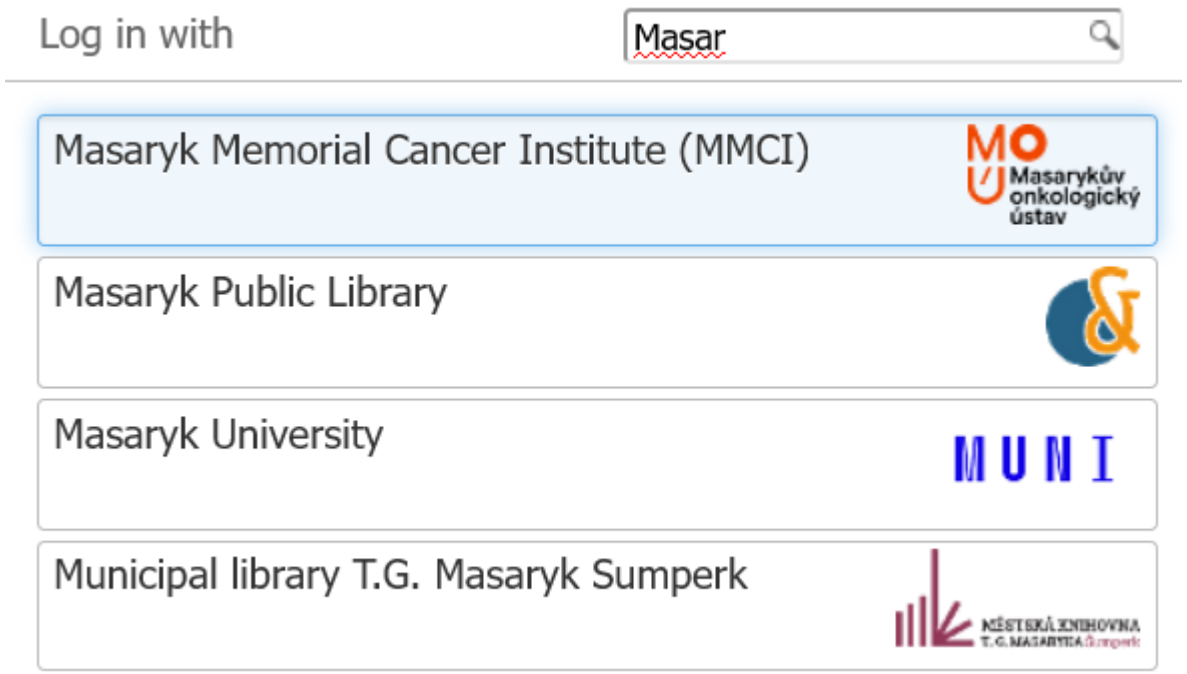



# Expert Support: Data Stewards

- Positions at research institutions focused on supporting research data management.
- Responsibility for setting up and following best practices when working with data.
- Ensuring data integrity and security and compliance with FAIR principles.
- The link between research, infrastructure and data management.
- IPs EOSC CZ can, among other things, help with the promotion of open jobs.
- More about data stewards on the eosc.cz website.

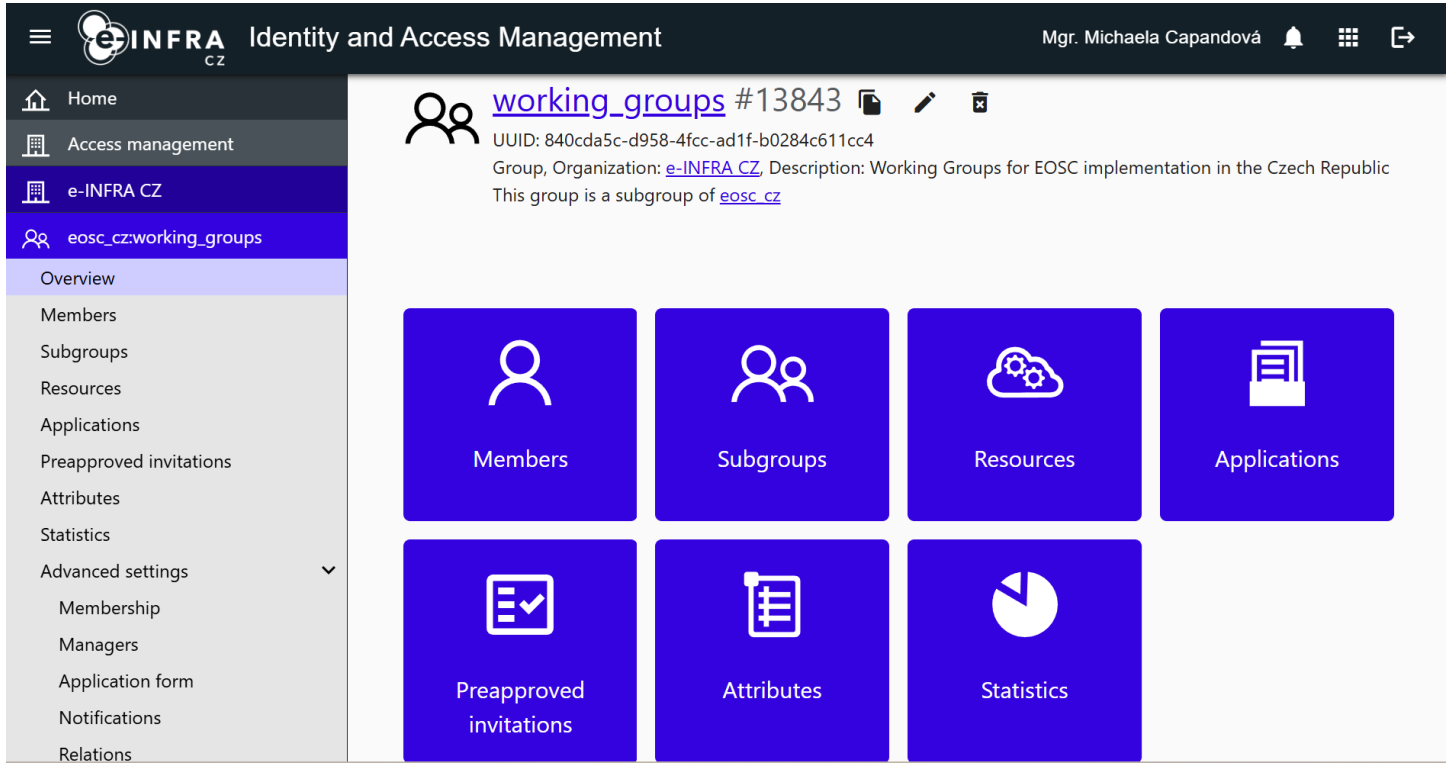
# Data Access Control

- 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, …



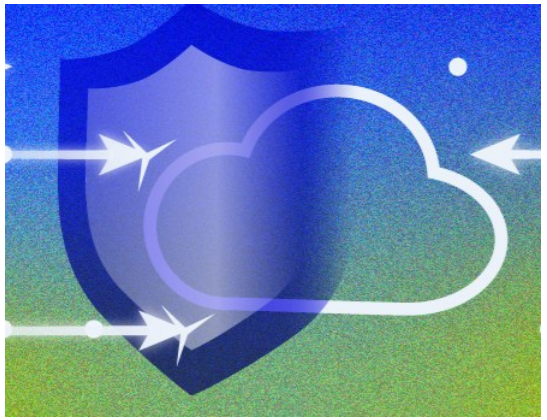
# Authentication and Authorization Infrastructure

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/



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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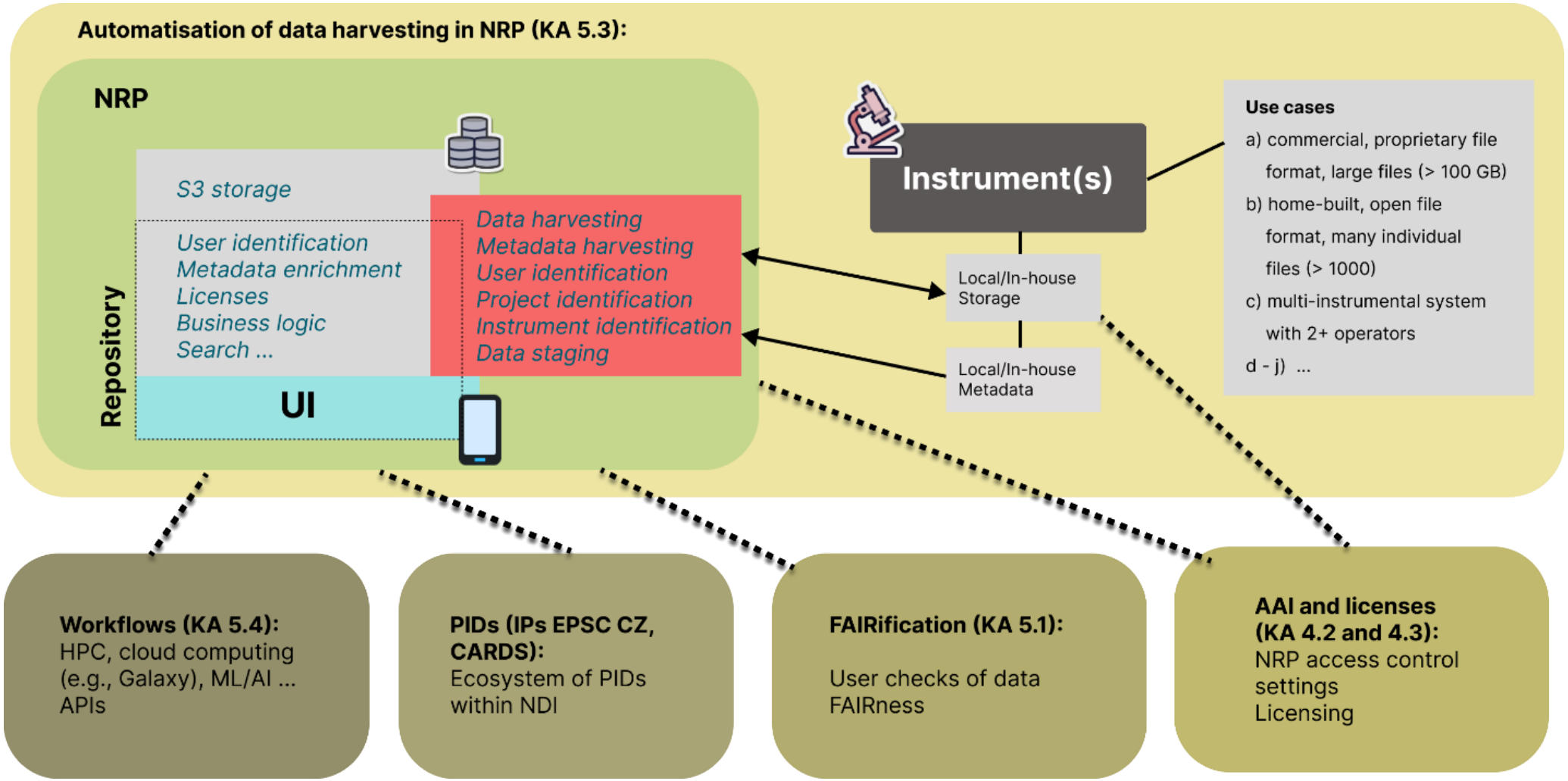
# Automation of Data and Metadata Collection

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



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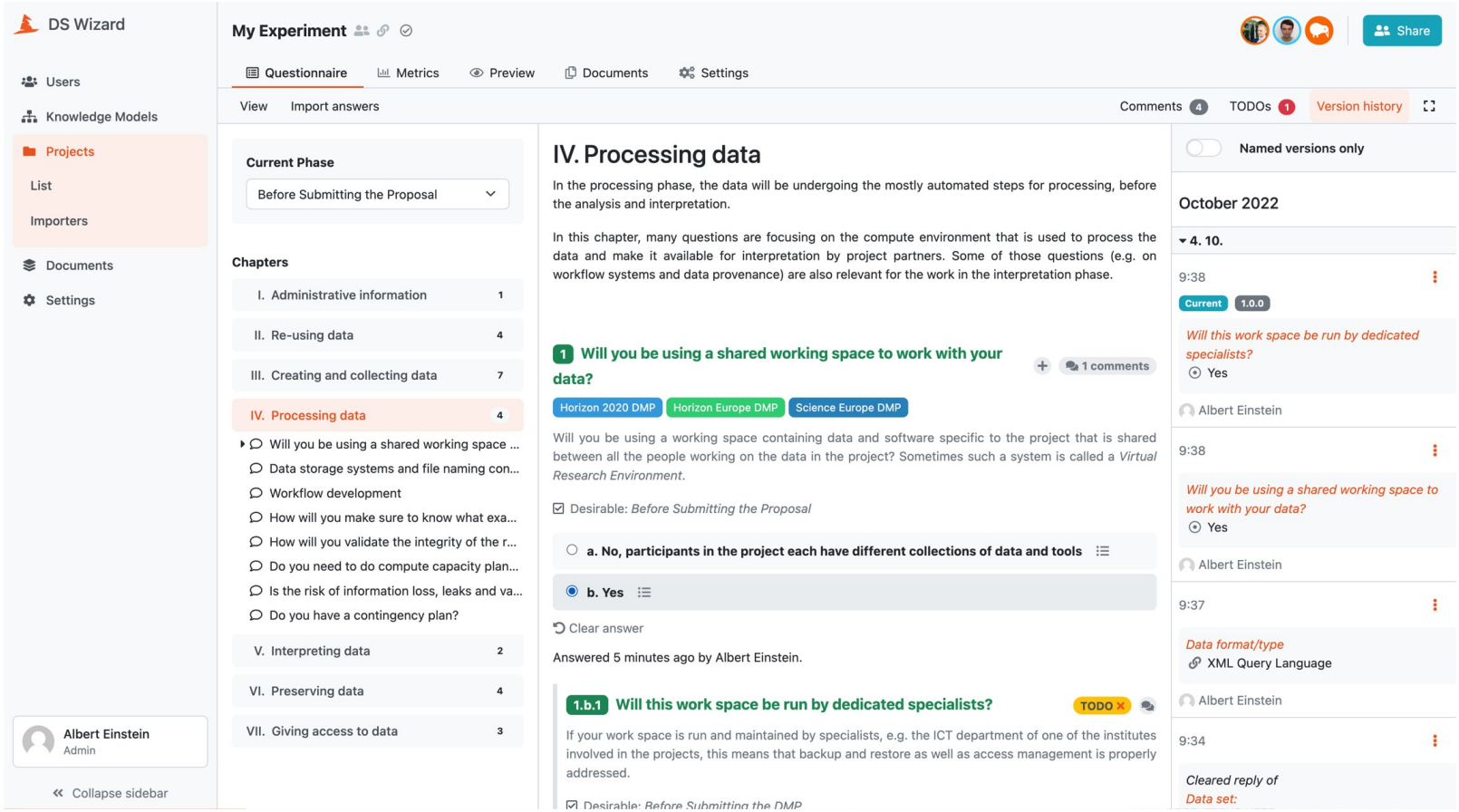
# Support for Data Management Planning

- 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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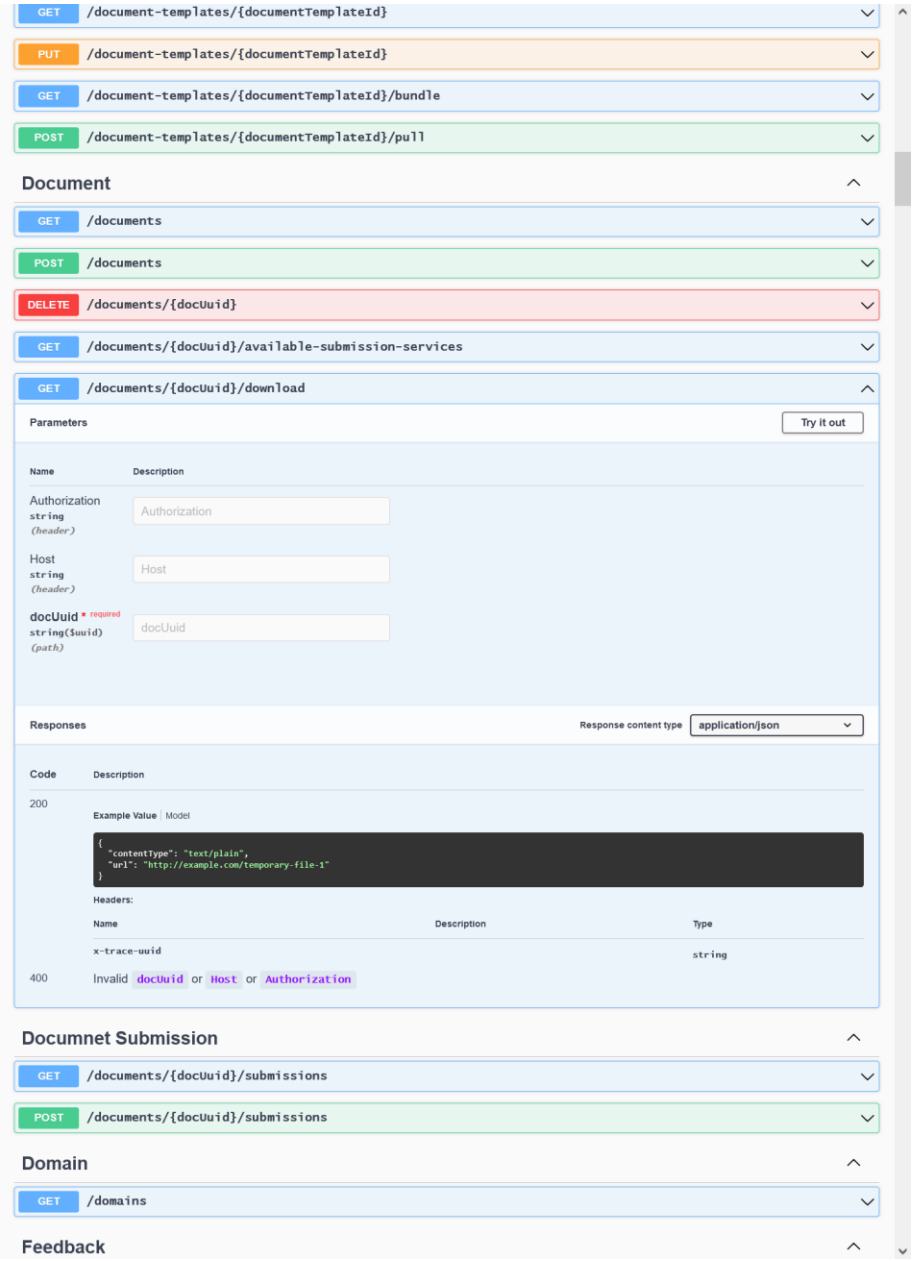
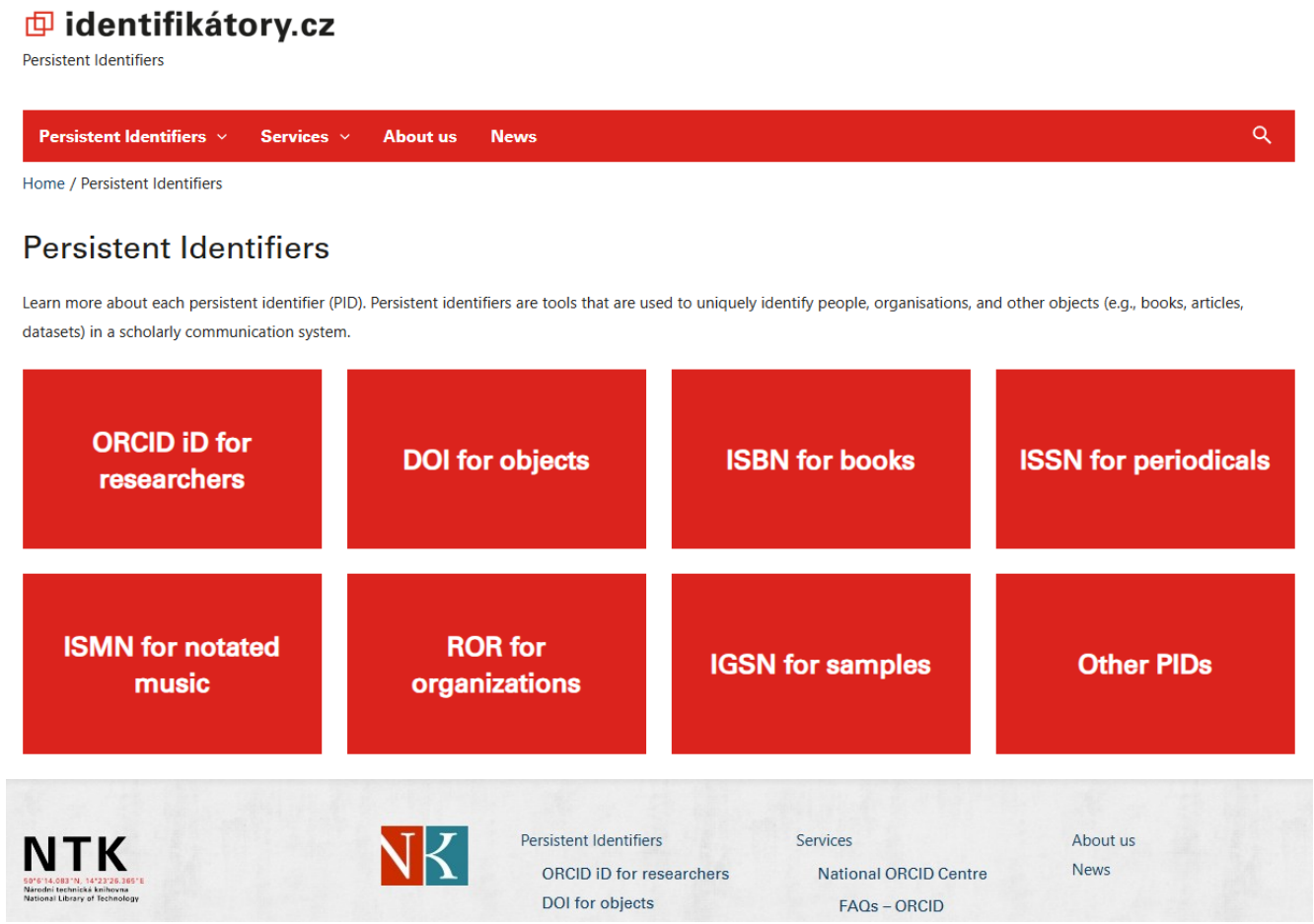
FAIR: Findable, Accessible, Interoperable

# 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, …



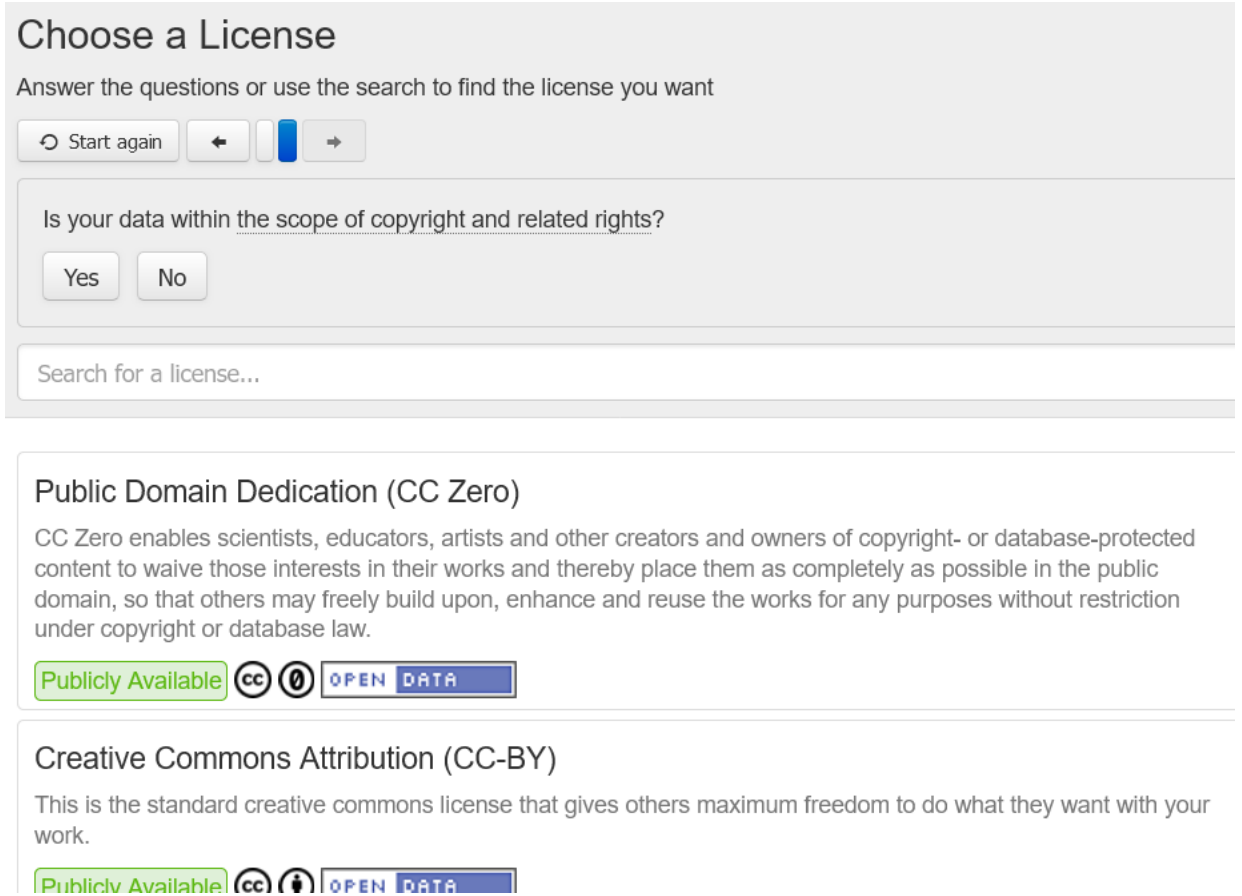
# Persistent Identifiers




https://identifikatory.cz/en/

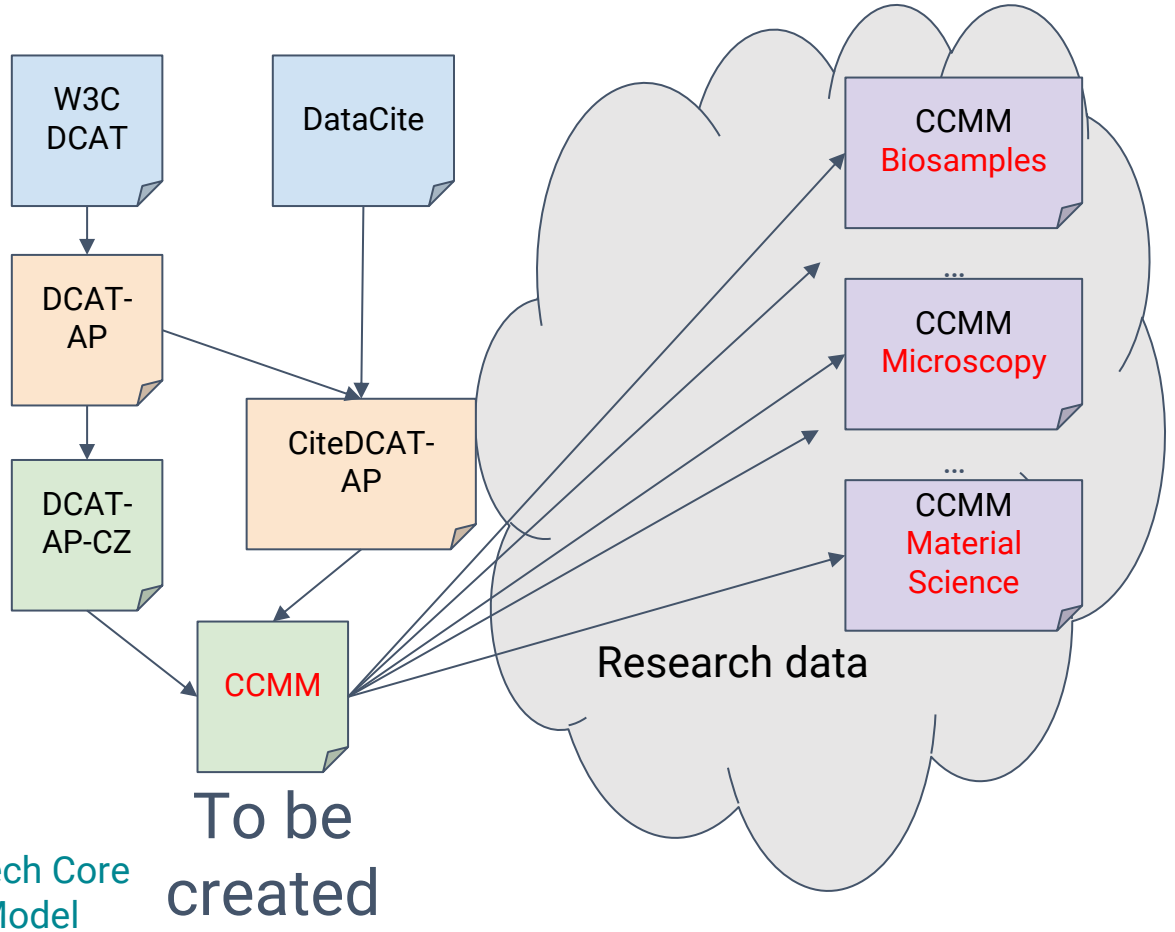
# Support Work with Licenses

- 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

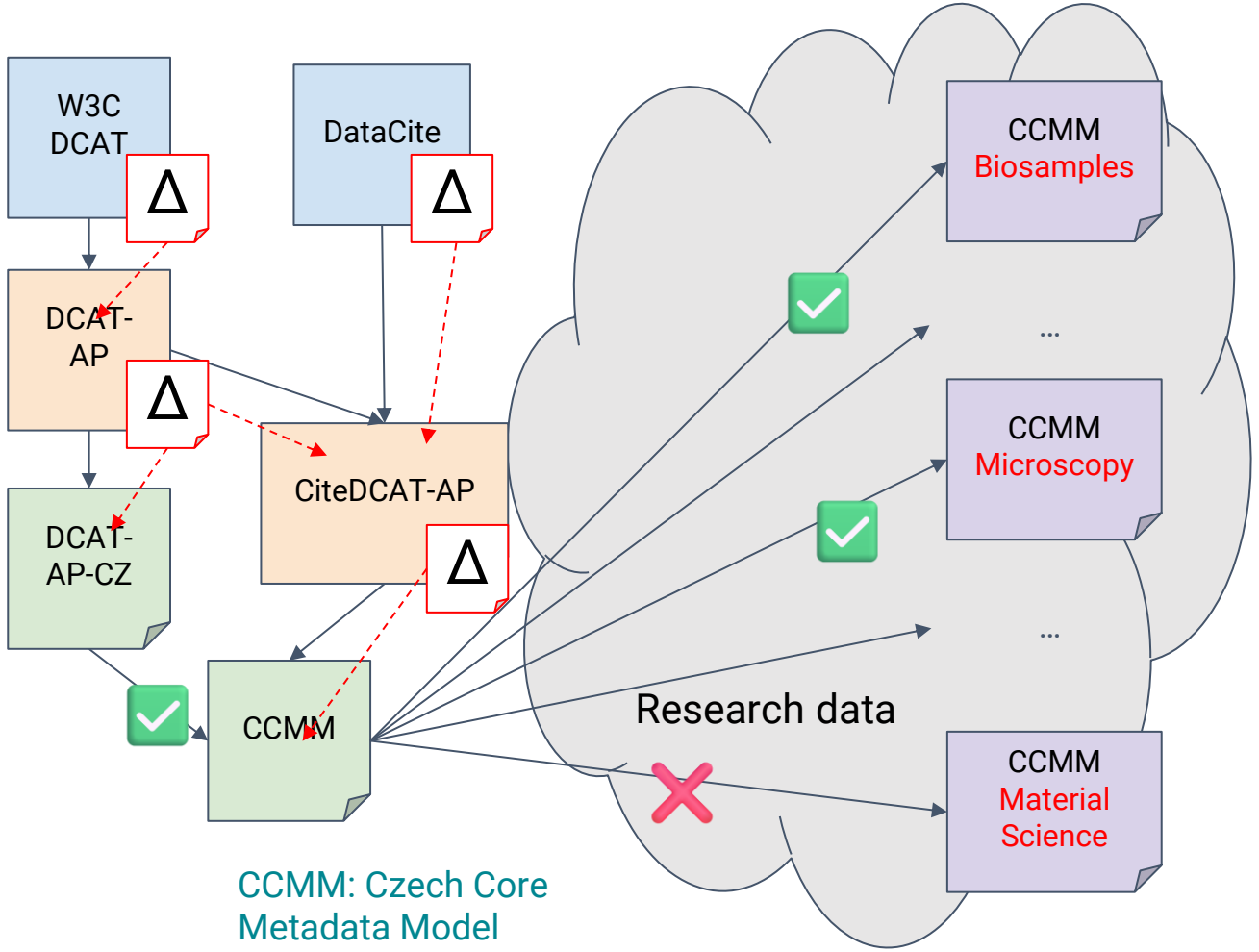
- https://dataspecer.com/
- Research data metadata profiles:
  - What happens, when
    - DCAT v2 → DCAT v3?
    - DCAT-AP v2.1.1 → DCAT-AP 3.0.1?
    - DataCite 4.4 → DataCite 4.5?
- We want changes to be propagated automatically.



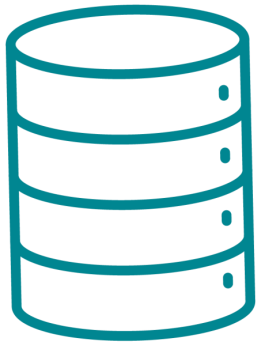

CCMM: Czech Core Metadata Model

# 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**

# Useful Links and Contacts

EOSC CZ Website

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

@EOSC Czech Republic

@eosccz.bsky.social

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# Thank you for your attention

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E: info@eosc.cz W: www.eosc.cz/en

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