PŘF MU OPEN SCIENCE SEMINAR

MUNI

9.11.2022

Open Science – Current status and emerging trends

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9.11.2022

Goals of today's seminar

„*The seminar will present the* *current state of Open Science and its impact on the research environment*, *specifically on the scientific research activity itself. Participants will be introduced to the* *general principles of Open Science* *and to specific sub-areas that this concept includes. The seminar will also introduce* *support options for Masaryk University* *researchers in this area.*"

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Todays' topics

1. **What and Why?** Open Science Concept, Open Access, Open/FAIR Data

2. **How?** Tools, methods, European Open Science Cloud, Open Resarch Europe, Horizon Europe etc.

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What and Why? Open Science Concept, Open Access, Open/FAIR Data

EC Definition of Open Science?

"Open Science represents a new approach to the scientific process based on cooperative work and new ways of diffusing knowledge by using digital technologies and new collaborative tools" (European Commission, 2016b:33).

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OECD Definition of Open Science?

"*To make the primary outputs of publicly funded research results* – publications and the research data – *publicly accessible* in digital format *with no or minimal restriction*" (OECD, 2015:7).
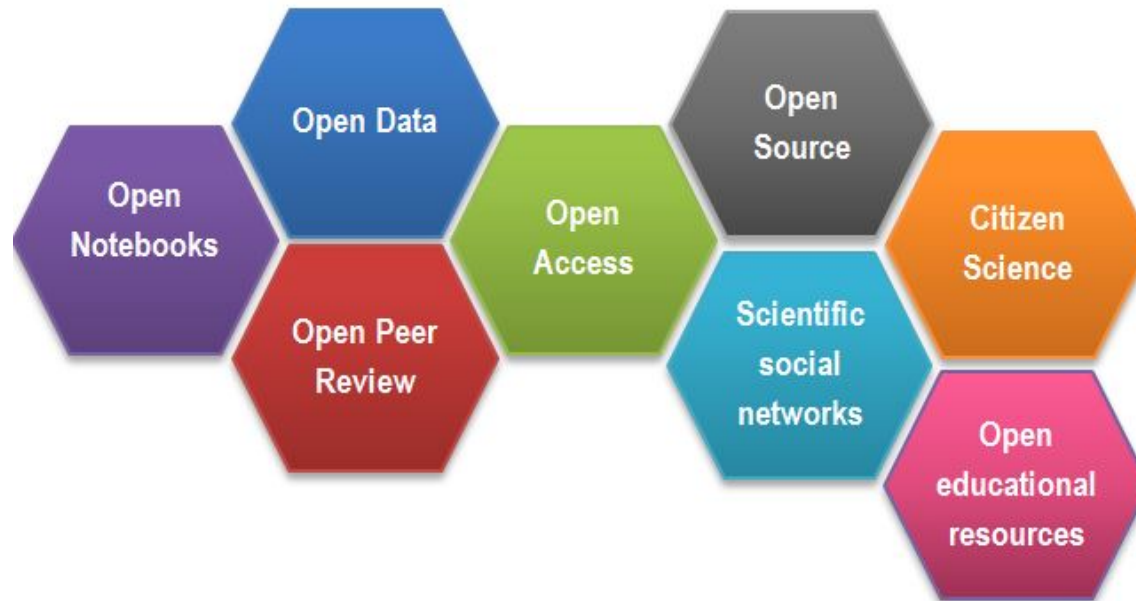
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FOSTER Definition of Open Science?

"*Open Science is about extending the principles of openness to the whole research cycle, fostering sharing and collaboration as early as possible thus entailing a systemic change to the way science and research is done.*"

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

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What is Open Science?

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

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What is Open Science 2?
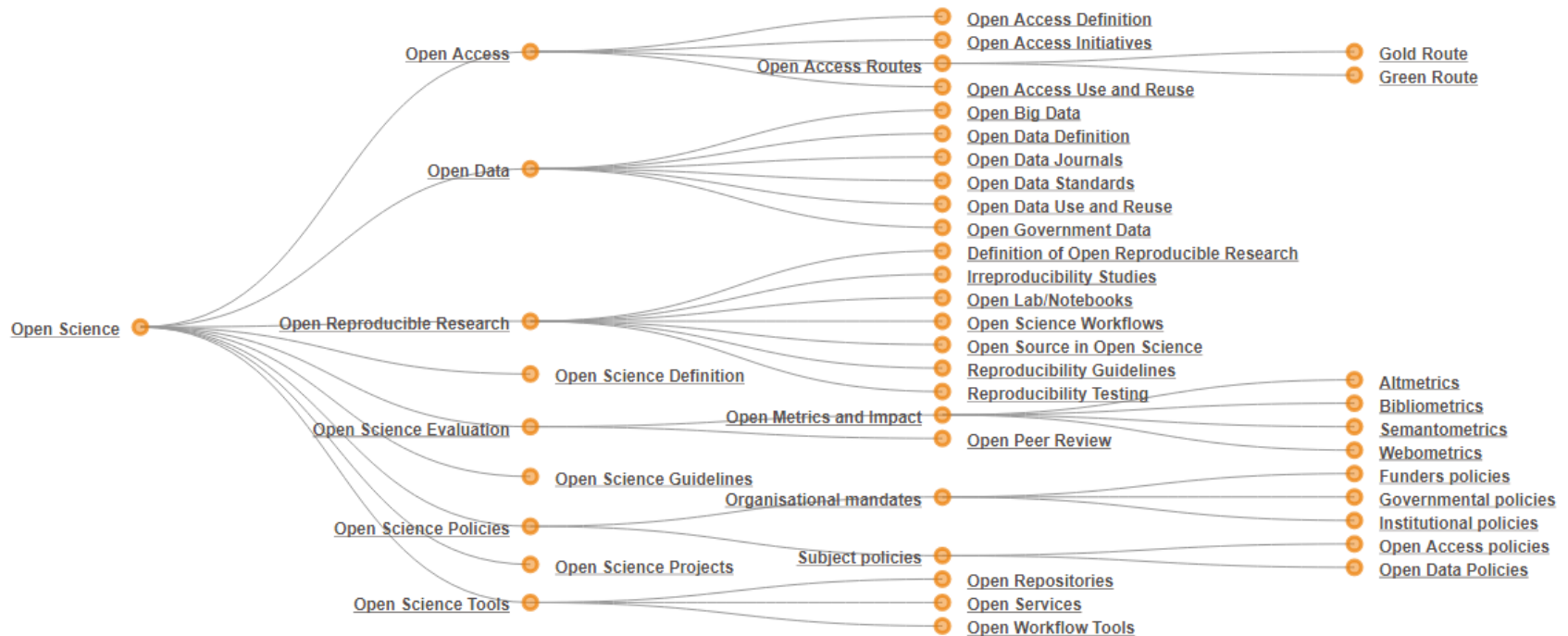
Source: https://www.fosteropenscience.eu/foster#taxonomy

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Open Science is still the same „old" science

Open Science = is still the same science, only its form is transformed for 21. century

More information: https://genomebiology.biomedcentral.com/articles/10.1186/s13059-015-0669-2

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Openness is only a form of publication

„Knowledge is open if anyone is free to access, use, modify, and share it — subject, at most, to measures that preserve provenance and openness."

Zdroj: https://opendefinition.org/od/2.1/en/

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Impact for Science: Development of Scientific Method

„A method of procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses. '*criticism is the backbone of the scientific method*'.

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Several ideas to consider when thinking about openning your research

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Research process (data vs. publ.)
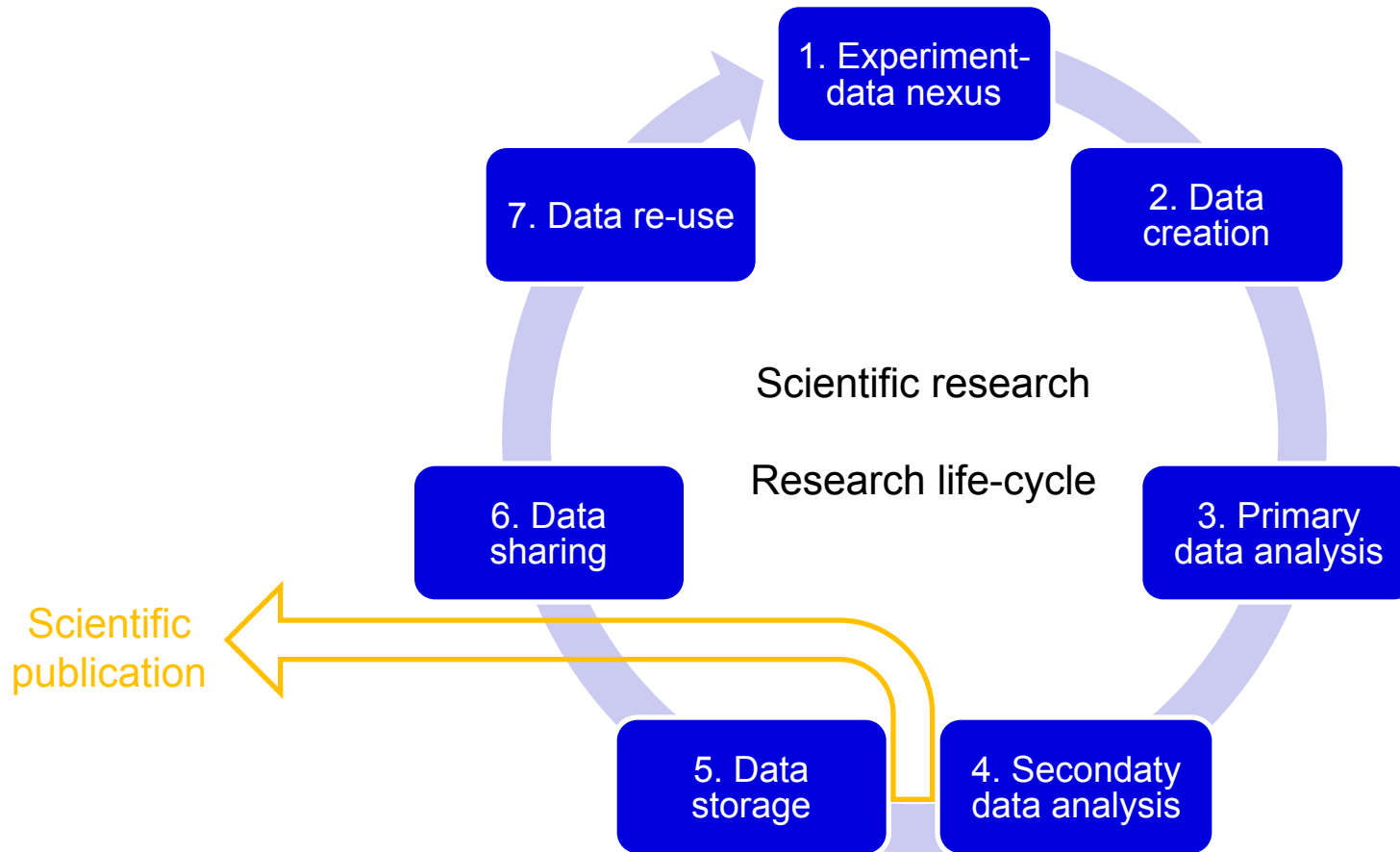
Interoperability is the key

3 layers to take into consideration:

1. Managerial (strategy, metodology)

2. Technical (repositories)

3. Legal (directives, licenceses CC)
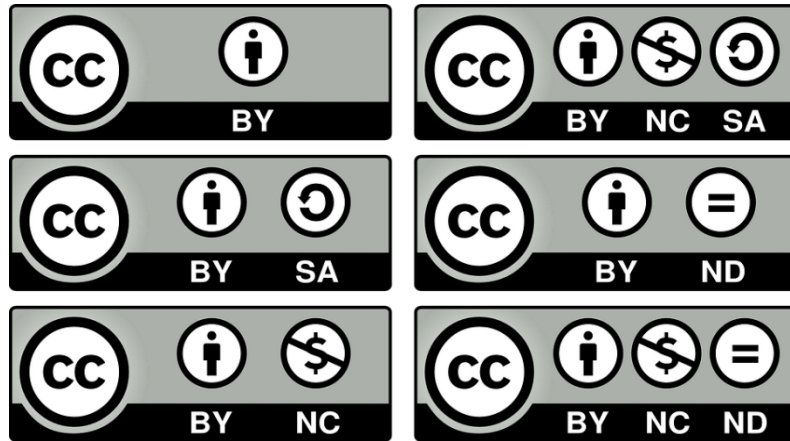
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Open Science Stakeholders

1. Scientists

2. Librarians

3. Data Specialists

4. Lawyers

5. Universities

6. Funders

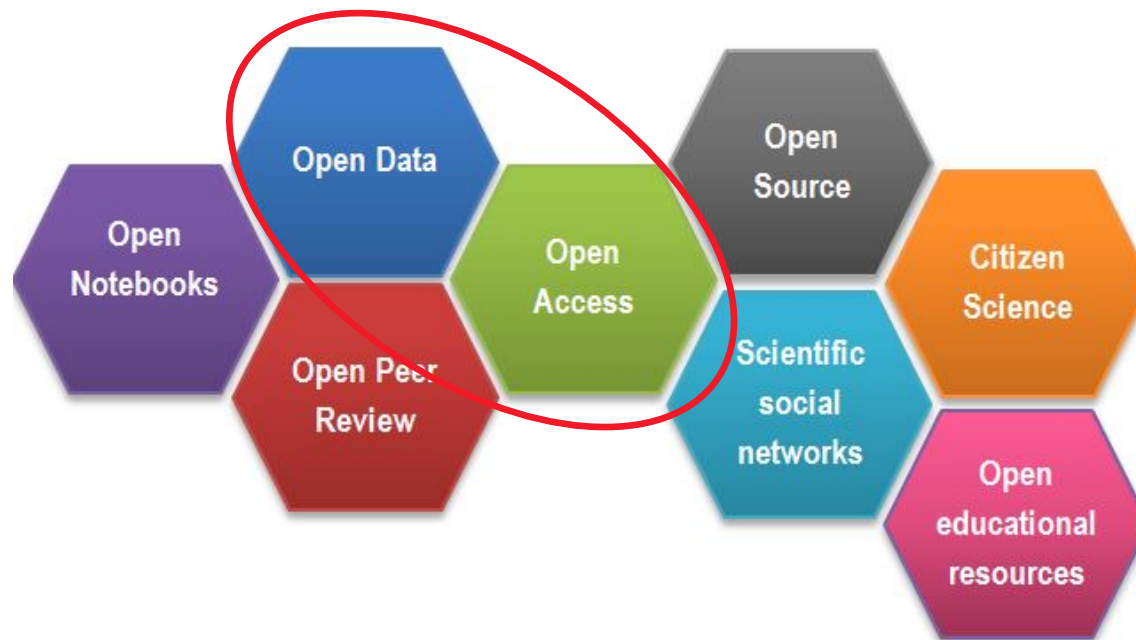7. Readers/Citizens

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Open Science vs. Commercialization
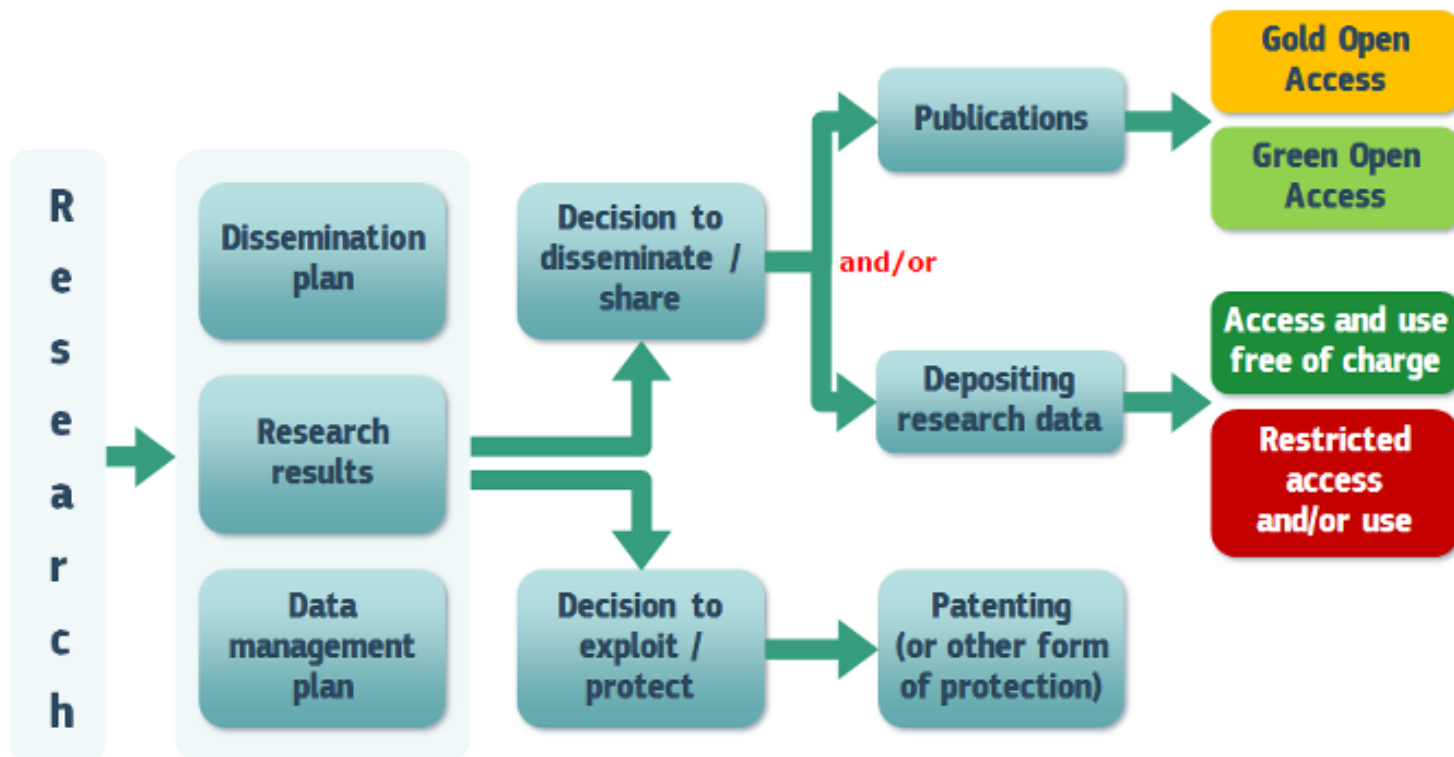
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CC Licence as legal tool to make OS reality

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What is Open Science at MUNI?

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

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Questions?

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Why is sharing of research data important?

Revision of results

– Wrong methodology, omission of „bad data", discovery of „manipulation" with data)

Reproducibility of science

– Possibility to repeat the experiment and compare results

Re-use of generated data

– Cost savings (there is no need to make an expensive experiment again)
– Uniqueness of data (use of data, that are not possible to gather again)
– Use of unused data (astronomy – pictures of night sky)
– Use of data in new contexts and for new uses

Acceleration of Innovation cycle (economic benefit)

– Possibility to innovate more rapidly by using the existing data
– Possibility for companies to use research data for innovation

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What to consider when thinking about Open/FAIR Data

– No immediate access („first use right")

– Not possible to open always (personal information or private know-how)

– Size of Data (GB, TB, PB, thousands of files)

– Variability of format and types (not only text)

– Differences between research fields – standards

– Different data categories (which one to share?)
  - Raw data (primary research data – analog from sensors and measurements,…)
  - Processed data (digitalization, cleaning, certification, anonymization)
  - Analyzed data (models, graphs, tables, visualizations -> discoveries, conclusions)

– Difficulties connected with sharing data for someone else (description, etc.)

– There is a lot thing to develop still
  - reliability, comprehensiveness, quality, ownership, long-term storage, data curation, …
  - Positive feedback from scientific community?

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Process definition of research data

„Data created during the research experiment".

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Two types of data to share

1. Data supporting a journal article

„Data, including associated metadata, needed to validate the results presented in scientific publications."

2. Individual data sets

„Other data, including associated metadata connected to particular research project (as specified in the 'data management plan")

Source: H2020 Programme AGA – Annotated Model Grant Agreement Version 5.2 – 26.6.2019. [online] s. 248. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf

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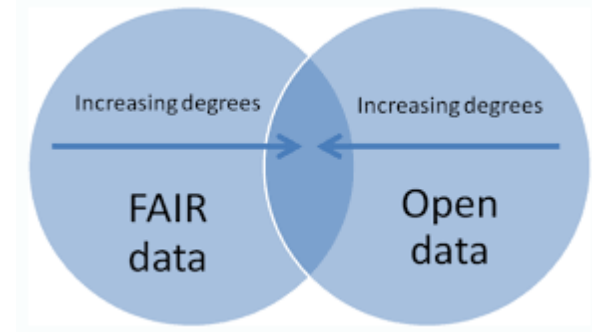
Open/FAIR data

Open Data ↔ <u>FAIR Data</u>
„As Open as Possible, as Closed as Necessary"

— **F**indable – metadata, registration, global persistent identifiers

— **A**ccessible – standards for machine-readibility, AAI

— **I**nteroperable – semantic description of data and metadata, standards

— **R**eusable – clear licensing, data provenance (reproducibility)

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Data layers

Data

„Managed" Data

FAIR Data

Open Research Data
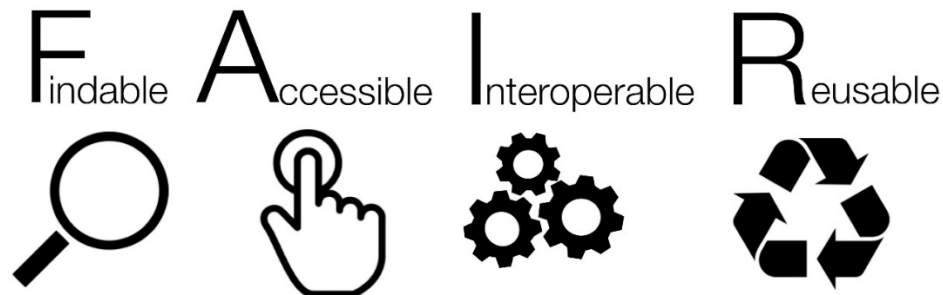
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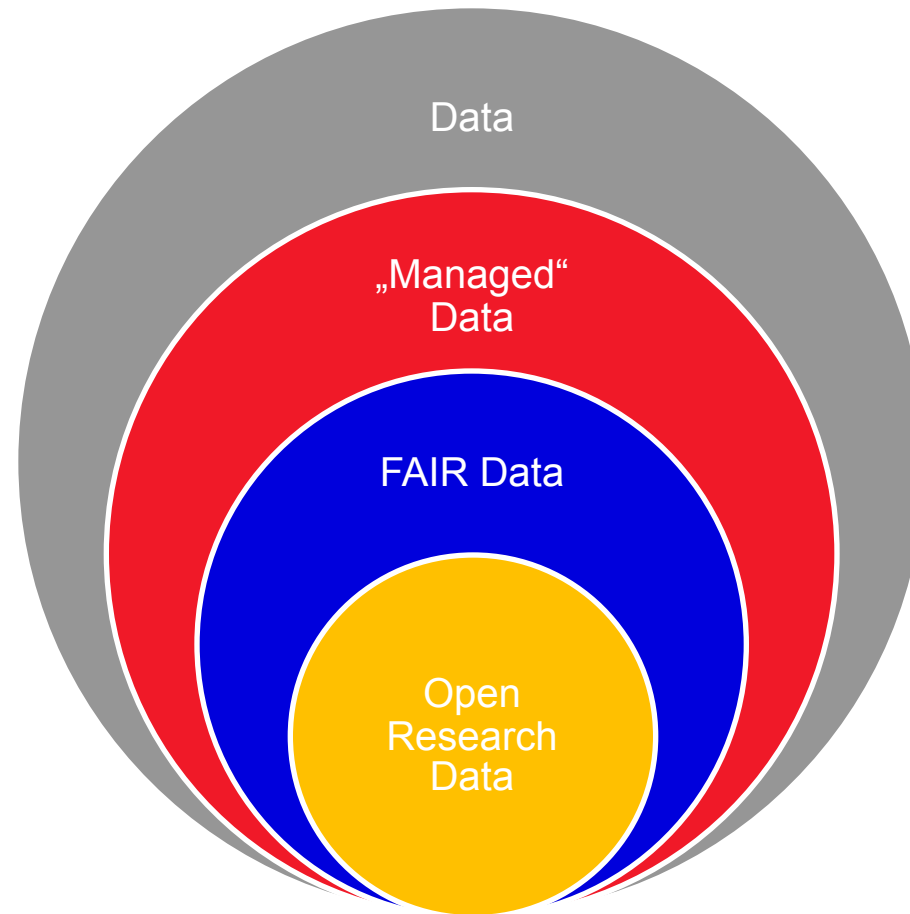
Research proces (data vs. publ.)

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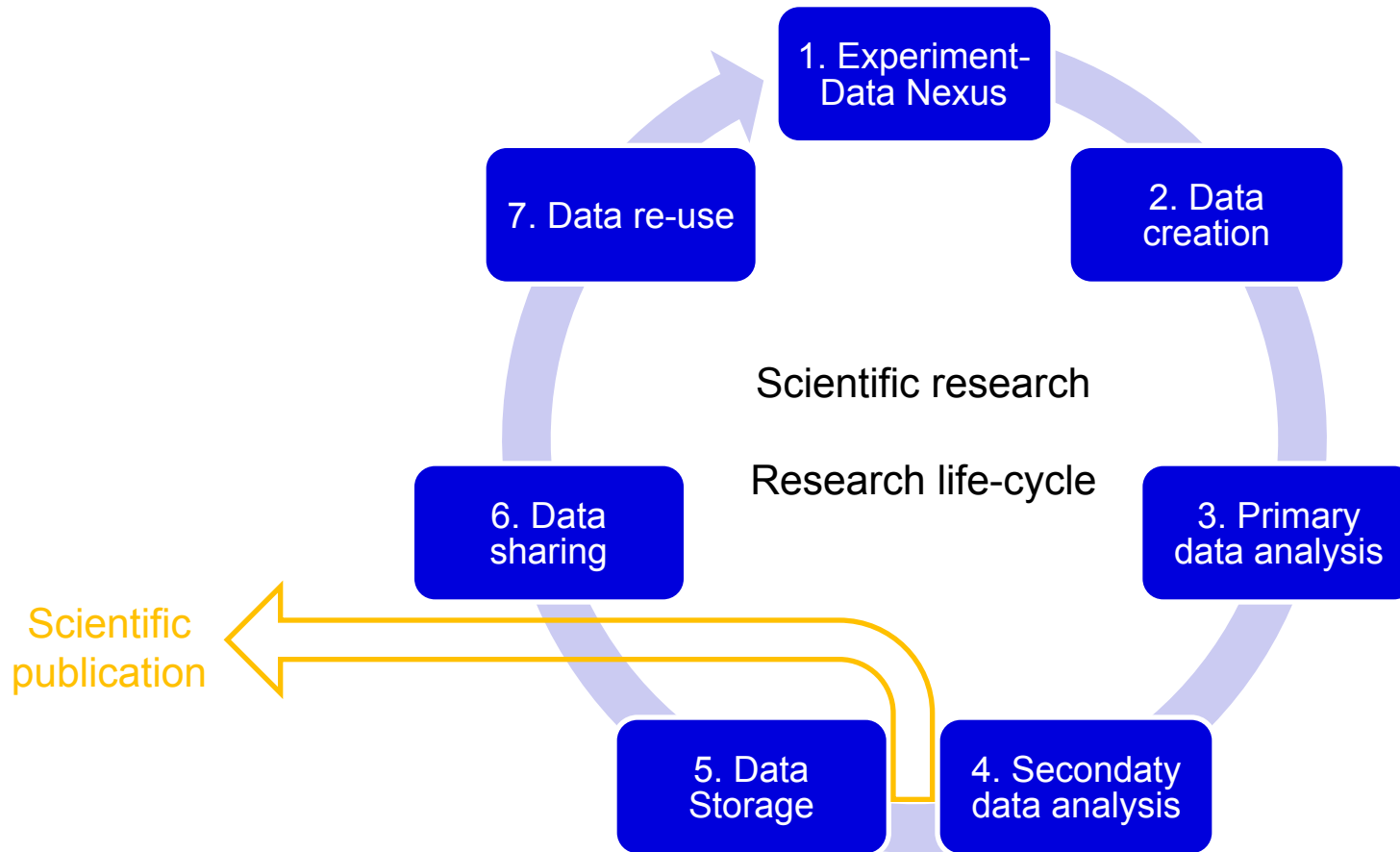
European/National Context

European Context

— **2019** New EU Open Data Directive

— **2020** New EU Data Strategy (**9 + 1 data spaces**)

— **2021** Horizon Europe – mandatory OS policy

— **2021** Preparation of new Data Act

— **2025** European Open Science Cloud (EOSC)

— Continuous development of Elixir and other field specific initiatives

National Context

— **2017** Czech National Strategy 2017-2020 – open access to **scientific information** (publications and data)

— **2022…**

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2. How? Practical Examples

Practial Open Science issues

1. Predatory journals/publishers

2. Funders conditions regarding the publication

   (Plan S)

3. APC fee – project planning

4. Development of evaluation of science

5. Data stewardship support

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Strategy Open Science MU 2022-2028 – Approved!

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Strategy Open Science MU 2022-2028 – 24 goals! (soon in english:)

Politika Open Access

- **OA1:** Uchovávání vědeckých publikací MU
- **OA2:** Zvýšení dostupnosti vědeckých publikací MU

Specializovaná podpora pro rozvoj Open Access

- **OA3:** Repozitář MU
- **OA4:** Vydávání otevřených publikací

Financování Open Access

- **OA5:** Fond OA MU
- **OA6:** Adaptace EIZ na transformační model

Politika FAIR Data

- **FD1:** Strategie pro správu a zpřístupňování výzkumných dat MU
- **FD2:** Evidence výzkumných dat

Specializovaná podpora pro rozvoj FAIR Data

- **FD3:** Datový repozitář MU
- **FD4:** Podpora pro správu a zpřístupňování výzkumných dat

Infrastruktura FAIR Data

- **FD5:** Infrastruktura pro výzkumná data

Podpora pro vědce

- **OS1:** DMP+
- **OS2:** Lidské zdroje
- **OS3:** Vzdělávání a informovanost
- **OS4:** Služby Open Science

Interní procesy

- **OS5:** Politiky na jednotlivých HS
- **OS6:** Open Science v kontextu evaluace vědy
- **OS7:** Open Science a grantová schémata MU

Standardy a principy

- **OS8:** DOI
- **OS9:** ORCID
- **OS10:** OpenAIRE
- **OS11:** AOAP, ACAN

Spolupráce

- **OS12:** Národní iniciativy
- **OS13:** Mezinárodní iniciativy

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Support at MUNI

— **Open Access Support** (Green OA info, APC vouchers info, Predatory Journals prevention, etc.)

— **DMP Support** ([DSW tool](), [Storage Recommendations](), Sensitive Data handling, FAIRification of Data)

— **Project Support** (Horizon Europe, OP JAK, Exceles, TAČR…) -

— **Specialized Support** (e.g. Citizen Science)

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DMP Tools Comparison

DMPonline

- Well known.
- Simple interactive form.
- Guidance from many organizations.

Argos

- Connection to OpenAIRE Graph.
- Publishing DMPs to Zenodo.
- Export to RDA DMP Common Standard.
- Isolate descriptions of datasets.
  - Dataset useable in multiple DMPs.

Data Stewardship Wizard

- Under development in the Czech Republic (ELIXIR).
- Concept of Knowledge Models.
- Metrics for measurements of FAIR atributes.
- Machine Actionable.

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Data Stewardship Wizard
https://dsw.muni.cz/

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Jan Slifka: Data Stewardship Wizard.
EOMAS 2019, 4 June 2019, Rome, Italy

https://ds-wizard.org/resources.html

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Open Research Europe (ORE)

European Open Science Cloud (EOSC)

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THANK YOU
FOR YOUR ATTENTION!

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