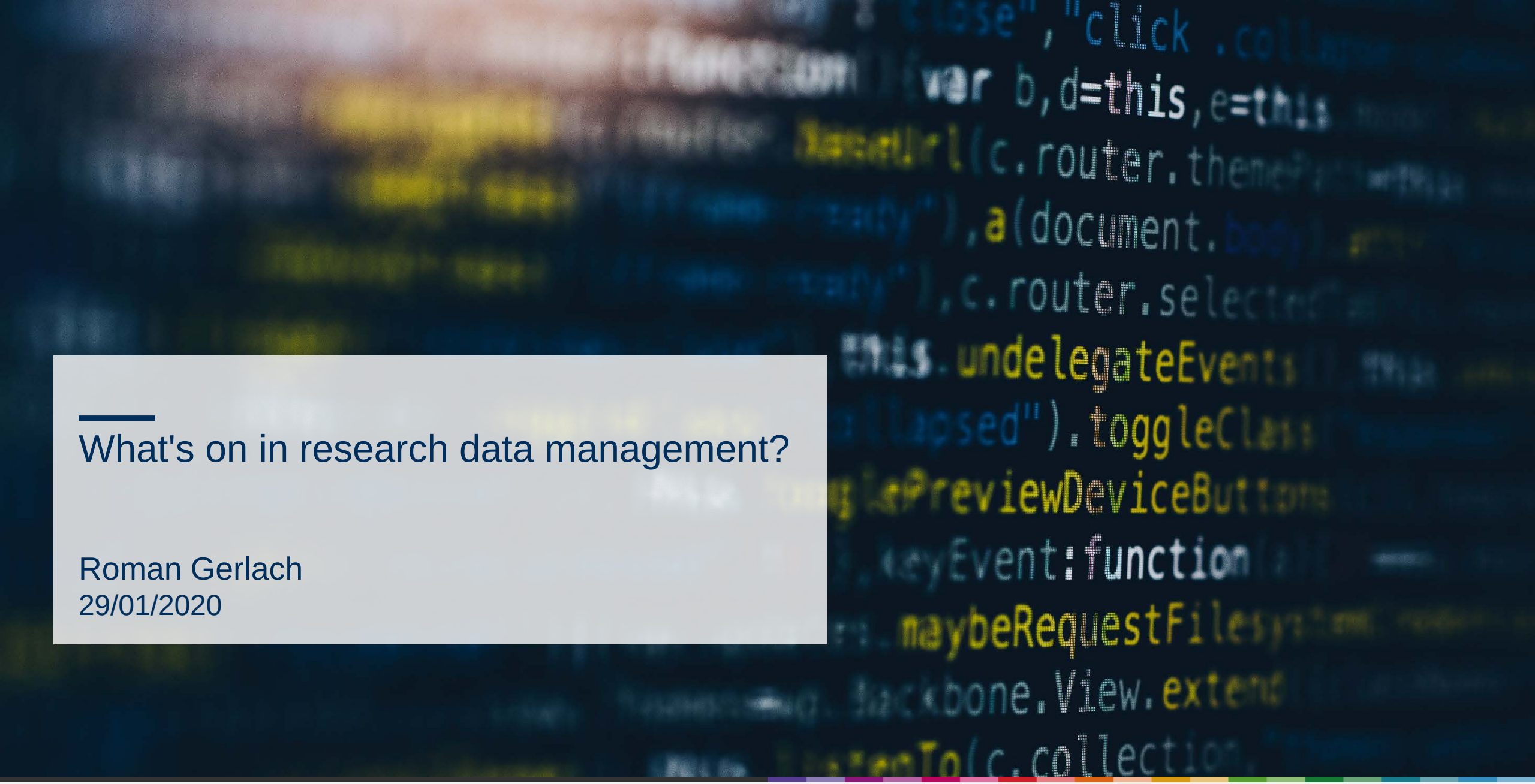


What's on in research data management?

Roman Gerlach

29/01/2020

Research Data Management Helpdesk

MichaelStifelCenterJena
for Data-Driven and Simulation Science

- established 2015
- Central contact point for all RDM aspects at FSU Jena
- Most recent information on our website:

www.researchdata.uni-jena.de

Helpdesk Services & Activities

MichaelStifelCenterJena
for Data-Driven and Simulation Science

Support

- On all data life cycle aspects
- Data management planning
- Data quality assurance & control
- Data publication
- Data preservation

Training

- Intro to RDM in existing lectures
- Module in M.Sc. „Computational and Data Science“
- Graduate Academy Courses: 1 - 2 day

Information

- Website (Infos and Links)
- Awarenes material and events (Video, Flyer, Poster etc.)

Research & Development

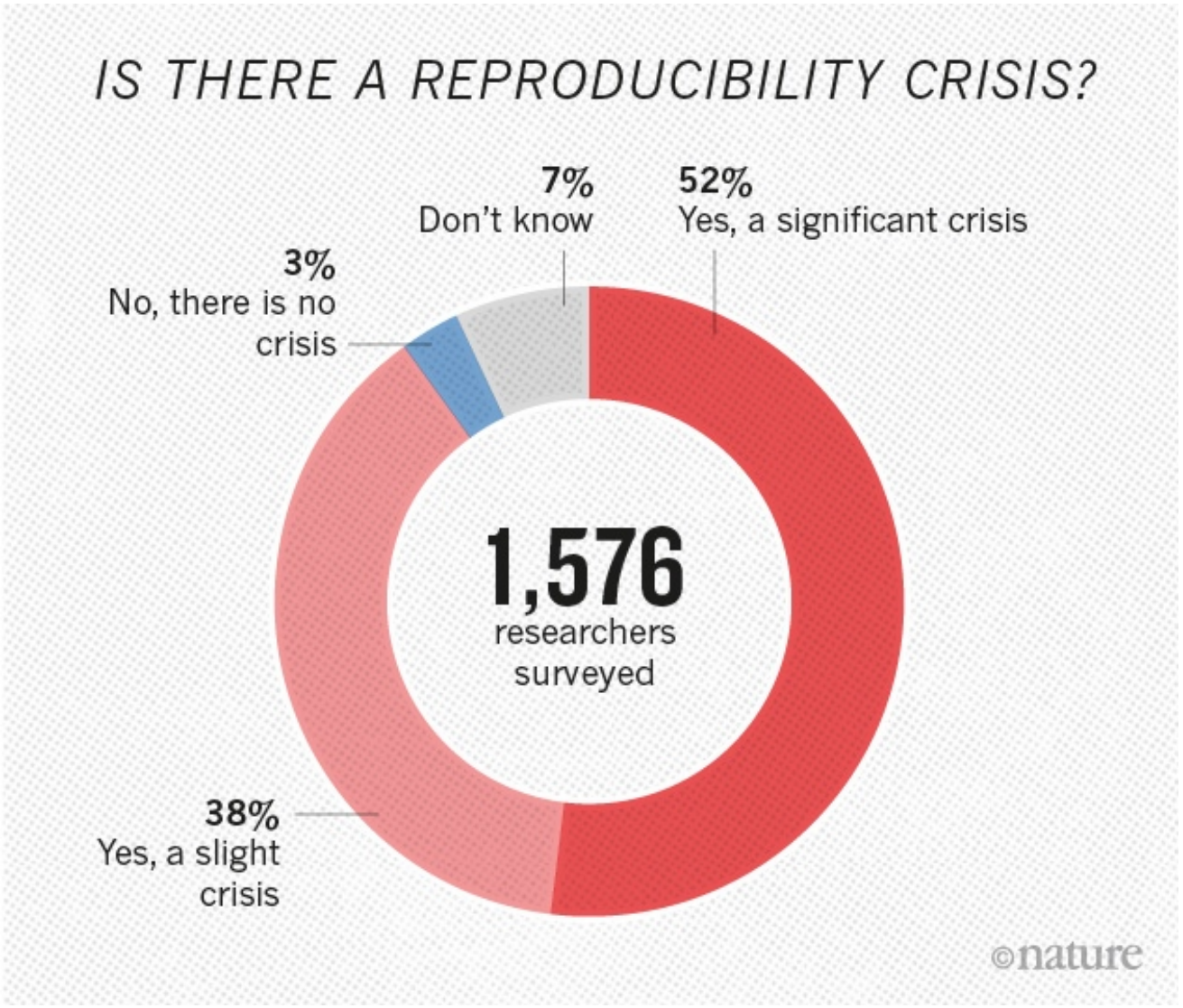
- BMBF Project eeFDM (2017-19)
- Participating in strategic developments at FSU and beyond
- Contributing to the RDM community

Outline

1. Introduction
2. Why Research Data Management?
3. What is Research Data Management?
4. Data/software publishing
5. Nationale Forschungsdateninfrastruktur (NFDI)

Abb. aus: Grasse, Marleen; López, Ania; Winter, Nina: Musterleitlinie für Forschungsdatenmanagement (FDM) an Hochschulen und Forschungseinrichtungen, 2018. https://doi.org/10.5281/zenodo.1149133. License: Other (Open)

Why *research data management*?



Baker (2016) Nature 533, 452–454 , doi:10.1038/533452a

Benefits

- Ensuring research integrity and reproducibility.
- Ensuring research data and records are accurate, complete, authentic and reliable.
- Increasing your research efficiency.
- Saving time and resources in the long run.
- Enhancing data security and minimising the risk of data loss.
- Meeting funding body grant requirements.
- Complying with practices conducted in industry and commerce.
- Preventing duplication of effort by enabling others to use your data.

(MANTRA 2013)

Data Policies

- international organisations
- funding agencies
- institutions
- publishers

Policies & Guidelines

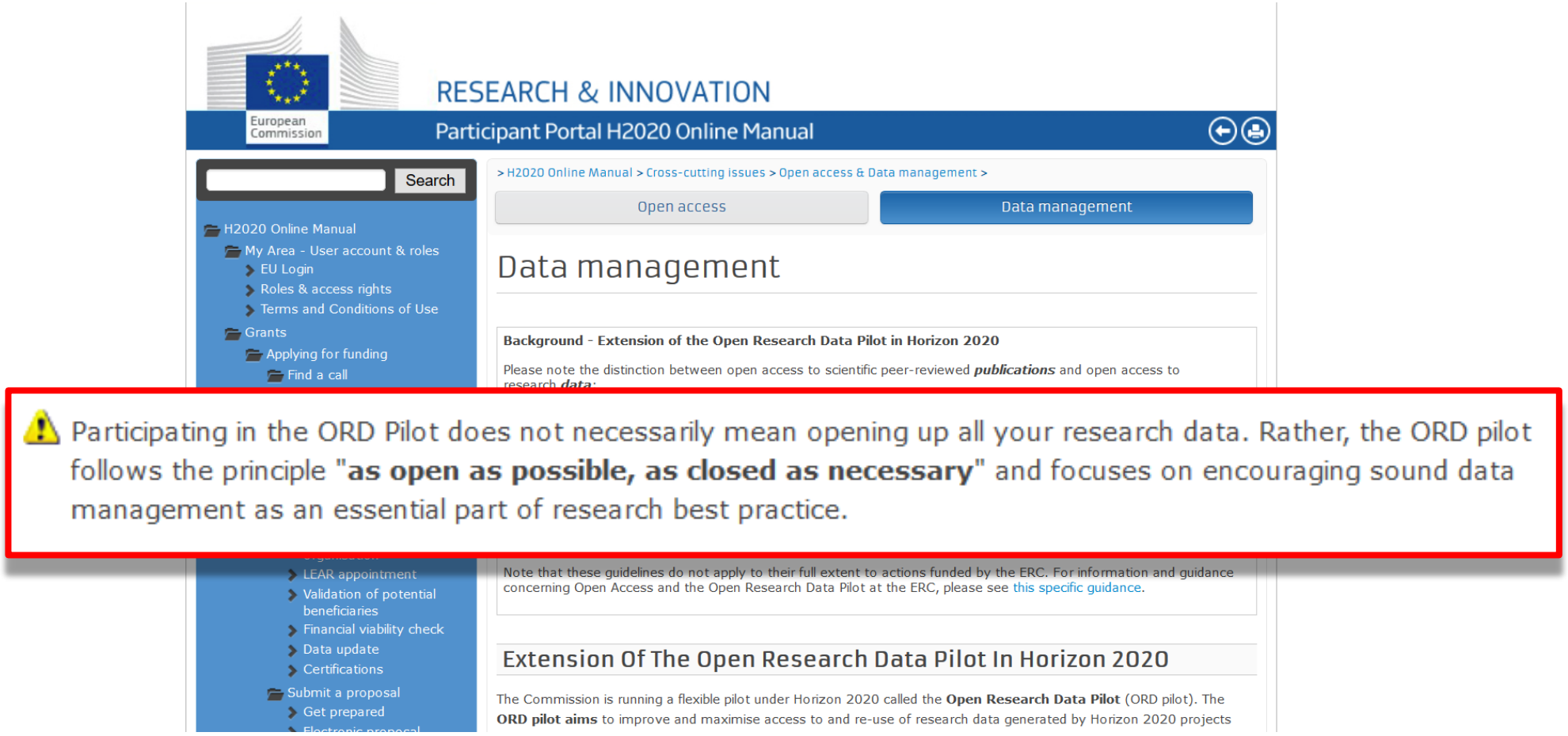
- **DFG Denkschrift “Sicherung guter wissenschaftlicher Praxis”, 1998**
- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, 2003
- OECD: “Principles and Guidelines for Access to Research Data from Public Funding”, 2007
- **Allianz: “Grundsätze zum Umgang mit Forschungsdaten”, 2010**
- G8: Science Ministers Statement , 2013
- **EC: Open Research Data Pilot Horizon 2020, 2014**
- **DFG: Leitlinien zum Umgang mit Forschungsdaten, 2015**
- Allianz: Positionspapier “Research data at your fingertips”, 2015
- OECD: Making Open Science a Reality, 2015
- **FORCE11: FAIR Principles, 2016**
- **FSU Jena: Leitlinie und Handlungsempfehlung zum Umgang mit Forschungsdaten, 2016**
- GWK: Beschluss zum Aufbau einer Nationalen Forschungsdateninfrastruktur, 2018
- **DFG: Kodex “Leitlinien zur Sicherung guter wissenschaftlicher Praxis”, 2019**

Example: DFG

- Guidelines on the Handling Research Data (2015):

> 2. Accessibility
> Assuming that the publication of research data from a DFG-funded project does not conflict with the rights of third parties (in particular data protection or copyright), research data should be made available as soon as possible. Data should be made accessible at a stage of processing that allows it to be usefully reused by third parties (raw data or structured data). To make sure this is the case, it must be ensured that access to the data is still guaranteed when, through publication, the rights of use relating to research data are transferred to a third party, usually a publishing house.
>
> 3. Long-term archiving
> In accordance with the rules of good scientific practice, research data should be archived in the researcher's own institution or an appropriate nationwide infrastructure for at least 10 years.

Example: European Commission



http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/data-management_en.htm

FAIR Principles

Findable
Accessible
Interoperable
Re-usable

https://www.force11.org/group/fairgroup/fairprinciples

Publishers Perspective

„[...] authors are required to make materials, data and associated protocols promptly available to readers without undue qualifications.“

“PLOS journals require authors to make all data underlying the findings described in their manuscript fully available without restriction, with rare exception.“

NPG (2013). Availability of data and materials. Retrieved from http://www.nature.com/authors/policies/availability.html
PLOS (2014). PLOS Editorial and Publishing Policies. Retrieved from http://www.plosone.org/static/policies.action

HELMHOLTZ GEMEINSCHAFT
Open Science

What is *research data management*?

Aspects of Research Data Management

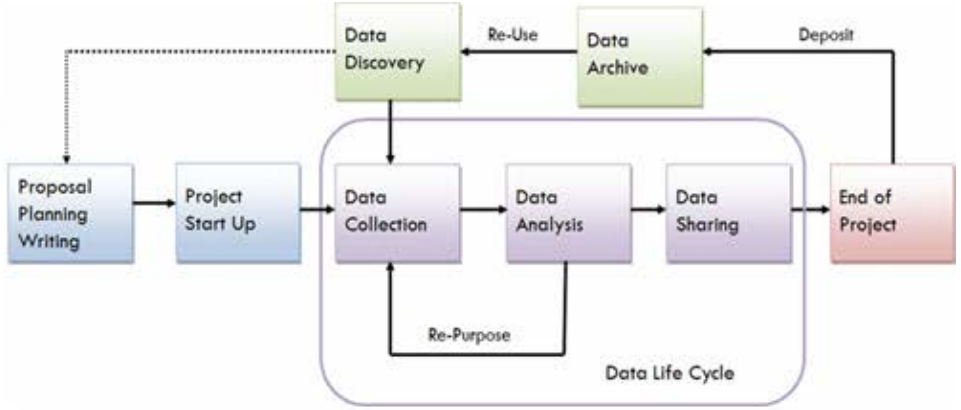
- Planning (incl. cost)
- Order and structuring
- Documentation and metadata
- Data security
- Storage and backup
- Publication
- Long-term preservation / archiving
- Legal aspects

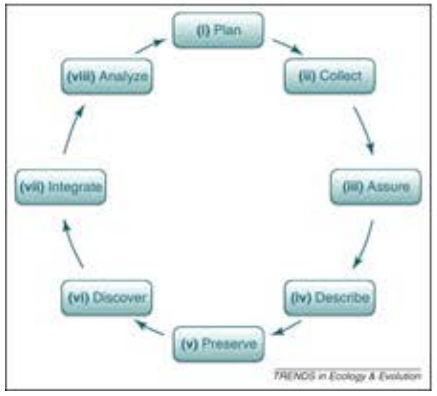
Biernacka et al. (2018)

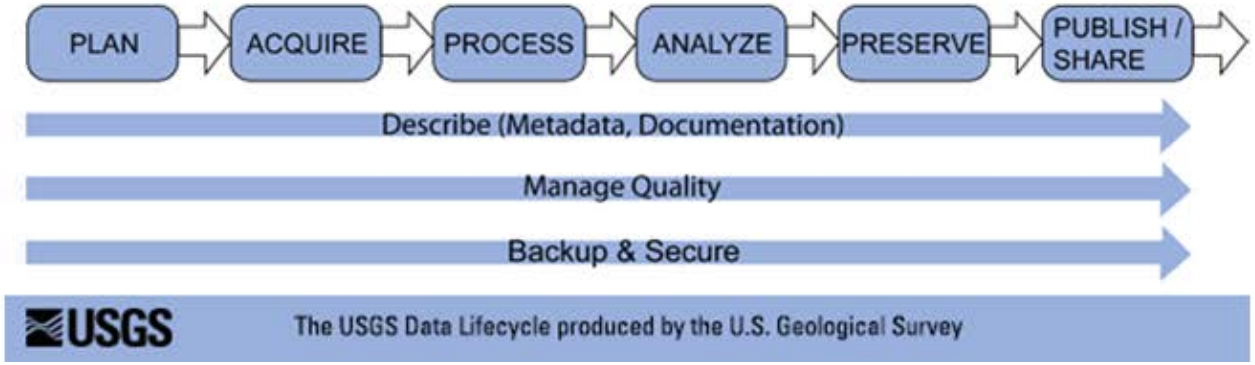
Research Data Life Cycle

https://www.ukdataservice.ac.uk/manage-data/lifecycle

there is many data life cycles ...



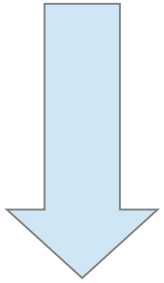




Data management refers to all aspects of creating, housing, delivering, maintaining, and archiving and preserving data. It is one of the essential areas of responsible conduct of research.

(MANTRA 2017: 5)

To ensure that no aspect of research data management is forgotten

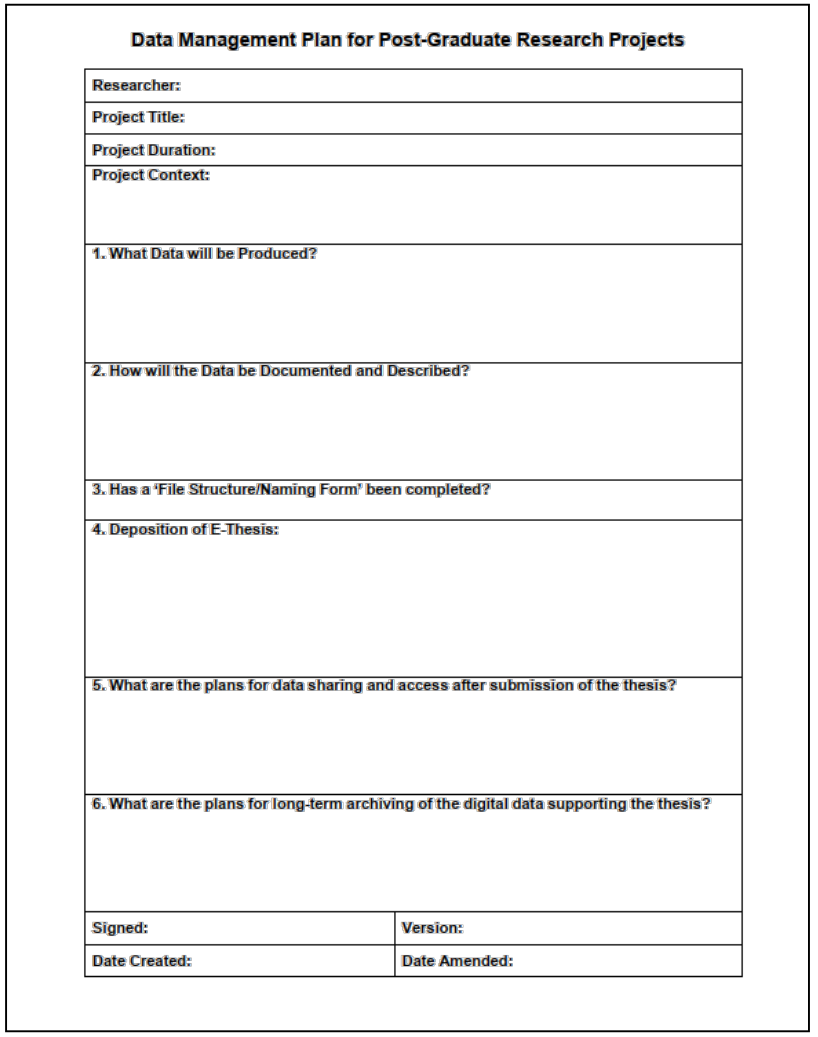


Research Data Management Plan

(DMP)

What is a DMP?

- (formal) document that outlines how you will handle your data both during your project, and after the project is completed
- Information about all stages of the data life cycle
- It's a *living document*



Data Management Plan for Post-Graduate Research Projects

Researcher:	
Project Title:	
Project Duration:	
Project Context:	
1. What Data will be Produced?	
2. How will the Data be Documented and Described?	
3. Has a 'File Structure/Naming Form' been completed?	
4. Deposition of E-Thesis:	
5. What are the plans for data sharing and access after submission of the thesis?	
6. What are the plans for long-term archiving of the digital data supporting the thesis?	
Signed:	Version:
Date Created:	Date Amended:

Why is a DMP needed?

- Provides a guideline during the project
- Defines responsibilities
- more and more funding agencies request it as part of a grant proposal (e.g. EU)

DMP for your working group/department?

DSW

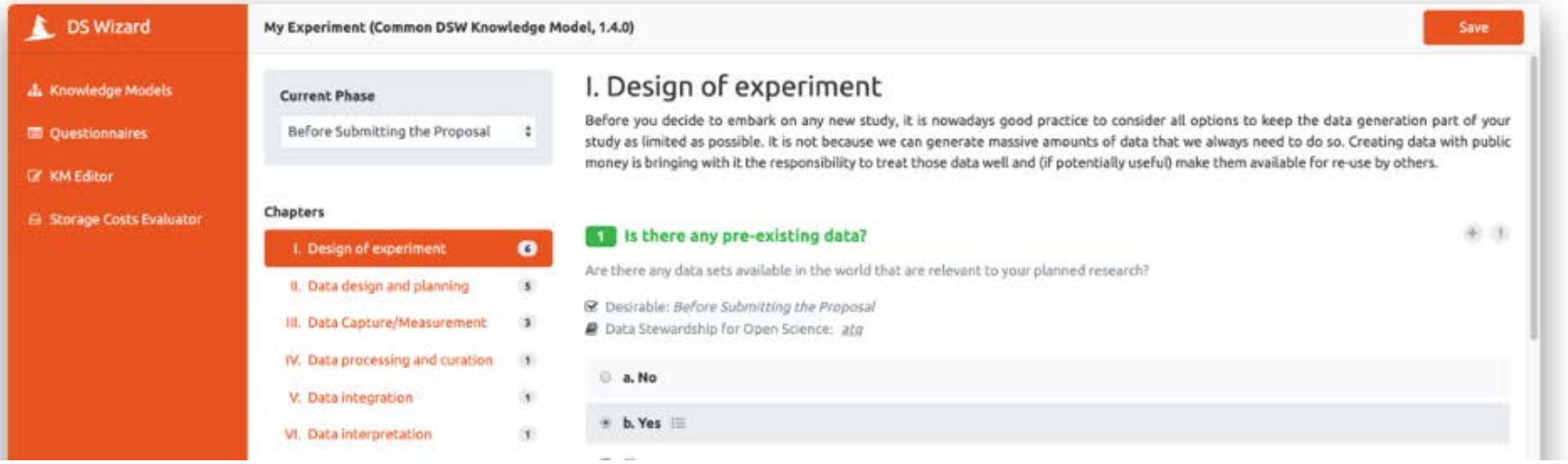
Features Media Get Started

Data Stewardship Wizard

Create Smart Data Management Plans
for FAIR Open Science

Get started

https://ds-wizard.org/



How will the data be managed during the project?

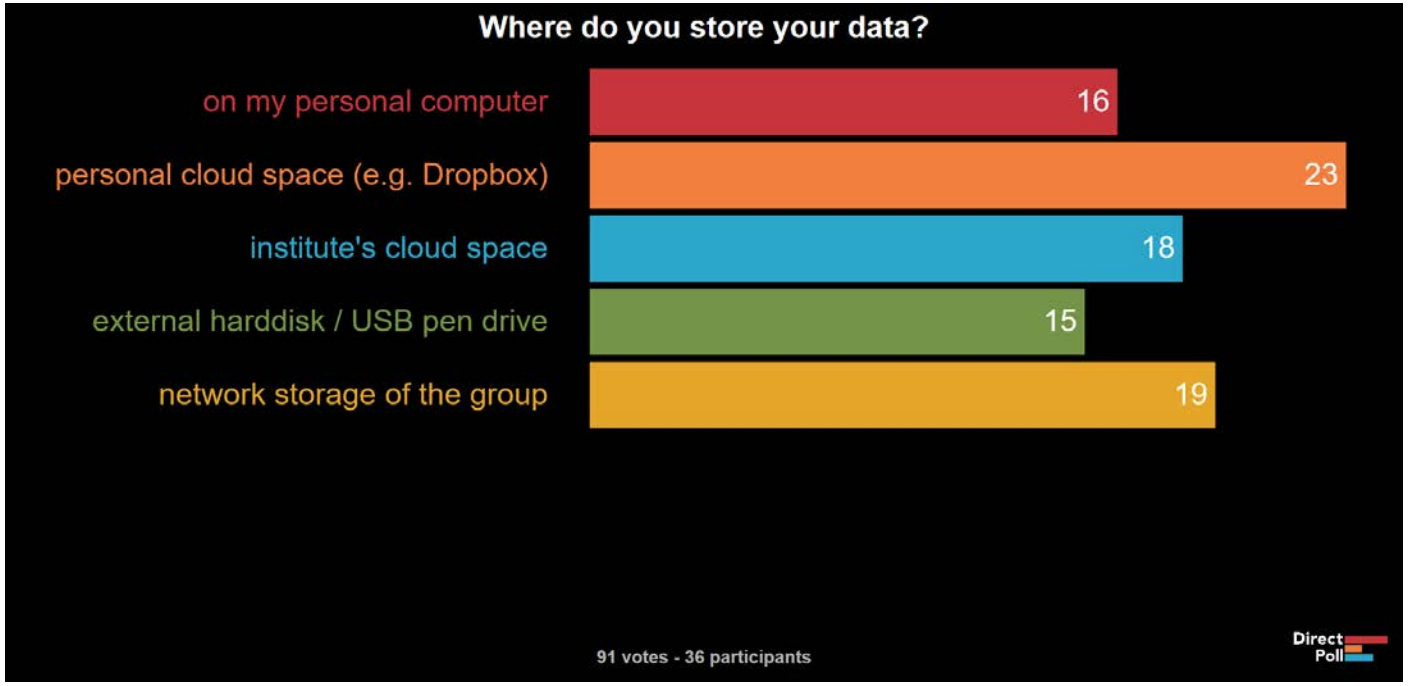
How will the data be managed during the project?

- storage capacity & back-ups (frequency, media)
- data organisation and structure (files, database)
- naming convention for files and folders?
- metadata creation
- version control (e.g. Git)
- Security & access control
- Who will be responsible?

Where do you store your data?

Live Poll:

http://etc.ch/2CfY



What are pro‘s and con‘s of these options?

Criteria for data storage

- Storage space
- network speed
- Access frequency (e.g. 24/7 online?)
- Share access (e.g. collaborators, home office?)
- Protection agains manipulation and theft
- Legal constraints (e.g. data privacy)
- Backup plan

What is you backup stategy?

Live Poll (#2):

http://etc.ch/2CfY

What are pro‘s and con‘s of these options?

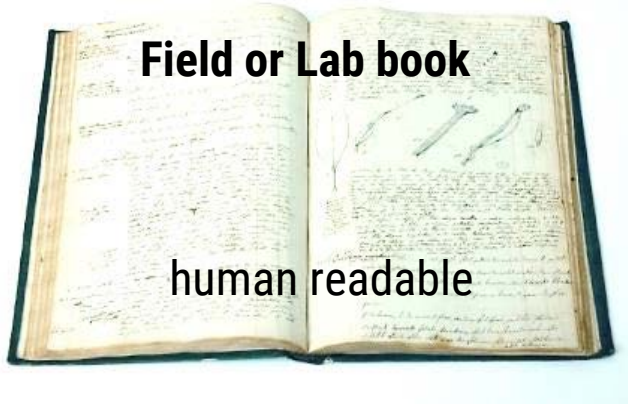
Backup

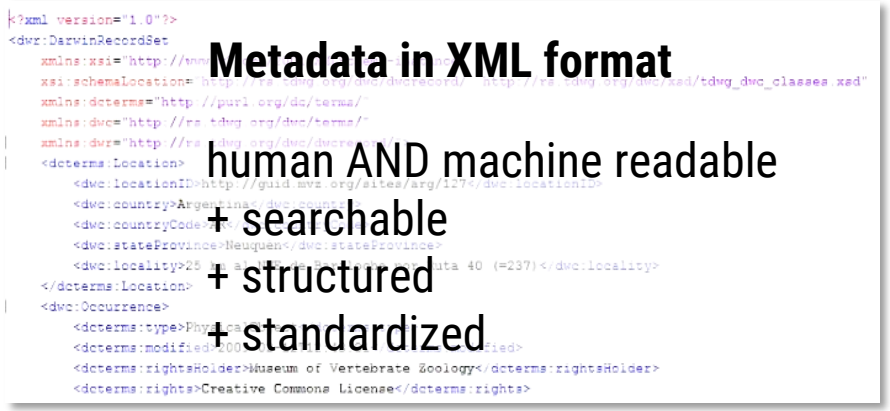
- 3-2-1 rule (3 copies, 2 types of hardware, 1 offsite)
- Prevent data loss due to hardware/software errors, theft, human error, viruses, accidents, …
- Frequent backups (e.g., when something was changed, daily, weekly)
- Save at least last three versions
- Restricted Lifetime → every 2-5 years new hardware
- (USB stick 10-30 years, hard drive 2-10 years, CD 5 -25 years)1

[1] https://www.zeit.de/wissen/2013-10/s37-infografik-speichermedien.pdf

Metadata

- Document your work (data), while you work
  - WHO created the data?
  - WHAT is the content of the data?
  - WHEN were the data created?
  - WHERE is it (from)?
  - HOW were the data collected?
  - WHY were the data collected?





Dublin Core Standard

created by
https://nsteffel.github.io/dublin_core_generator/generator_nq.html

```
<dc:title>The Northwind and the Sun/Thuringia</dc:title>
<dc:creator>Psychology Team</dc:creator>
<dc:subject>Aesop's Fable</dc:subject>
<dc:description>Please see the publication XY for more
information.</dc:description>
<dc:publisher>FSU Jena, Dep. of Psy</dc:publisher>
<dc:contributor>Schweinberger/Zäske</dc:contributor>
<dc:date>3-2-2019</dc:date>
<dc:type>sound</dc:type>
<dc:format>recordings saved as .wav</dc:format>
<dc:identifier>doi.org/123456</dc:identifier>
<dc:source>f</dc:source>
<dc:language>deu</dc:language>
<dc:relation>referenced by DOI xyz</dc:relation>
<dc:coverage>East Thuringia, 2017-19</dc:coverage>
<dc:rights>https://creativecommons.org/XYZ</dc:rights>
```

Metadata

- Use standards whenever possible
  - ISO 8601 Codes for date and time:
    e.g. 2014-06-19T13:15:30Z; 2014-06-19T13:16:30+01:00
    http://en.wikipedia.org/wiki/ISO_8601
  - Consistent terms/definitions/nomenclature
  - Domain-specific controlled vocabulary
- 20 year rule: The metadata accompanying a data set should be written for a user 20 years into the future.
- But at least have a README.TXT file.

Metadata Concept Map by Amanda Tarbet is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Data Versioning

- **Why it is important?**
- Reproducibility (identify and retrieve the exact same resource that the author used)
- Keep track of changes/updates (e.g. “dynamic” data from sensors)
- Hint: use timestamps instead of version numbers

- **For more details:**
- ANDS: http://www.ands.org.au/working-with-data/data-management/data-versioning
- DCC: http://www.dcc.ac.uk/resources/how-guides/cite-datasets#sec:versions

How will the data be managed after the project?

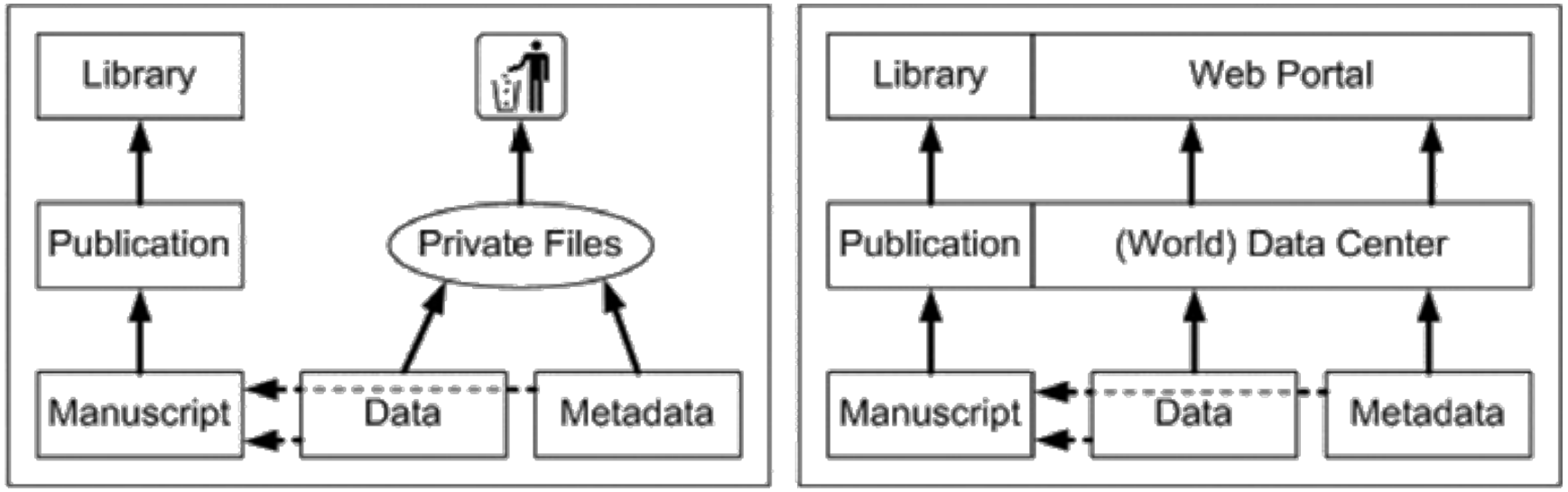
How will the data be managed after the project?

- Data Publication vs. data archiving?
- Where can I publish my data?

  Isn't my website enough?
- Maintenance of existing technical infrastructure?
- Migrating data into a (public) data repository?
- Embargo periods?

➡ Funding organisation encourage/request data publication, not only data archiving

Reality Check?!



(Rümpel 2011:26)

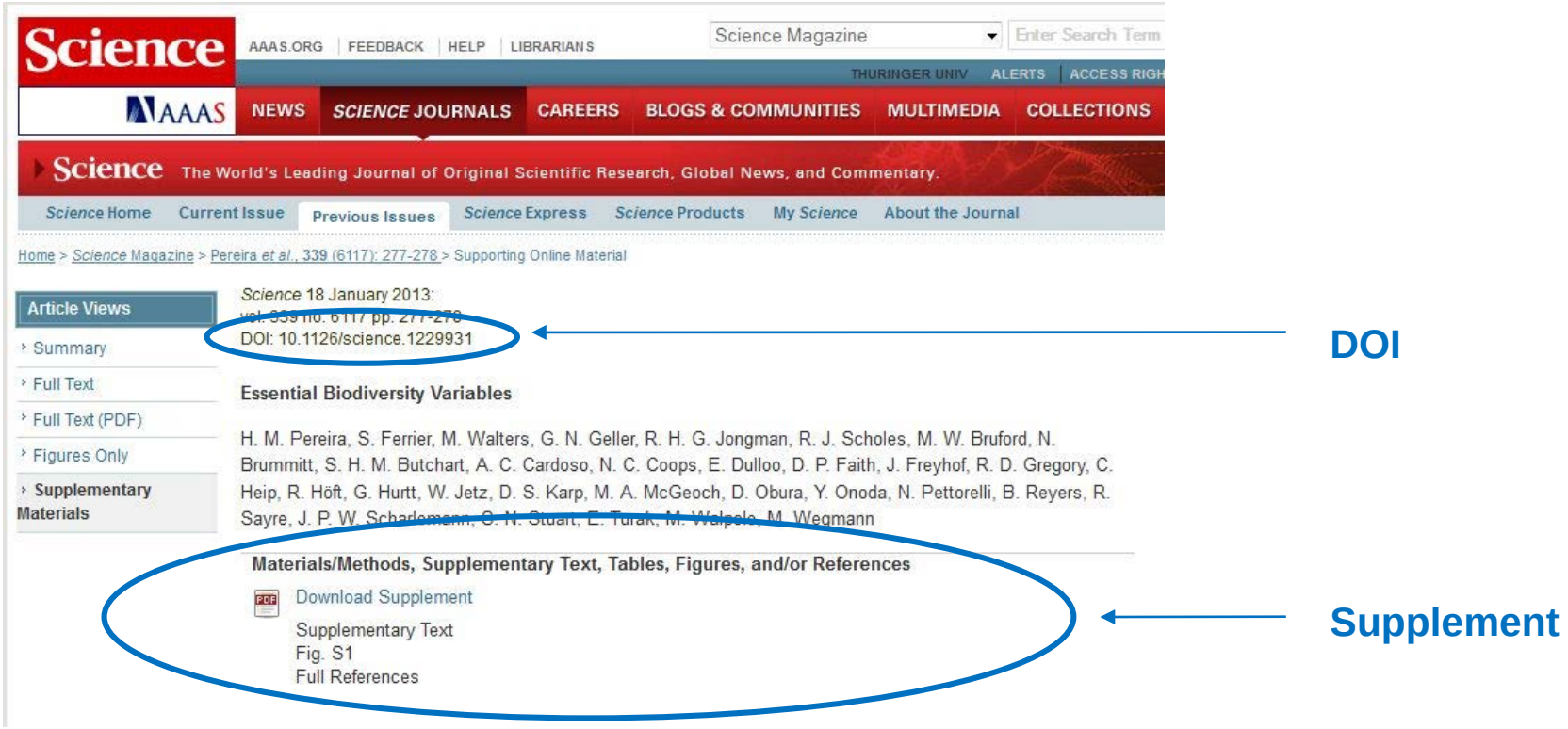
Data Publication

How can I publish my data?

- journal + supplement
- data journal
- data repository

Journal

Journal = Paper + PID + [supplement]



Data Journal

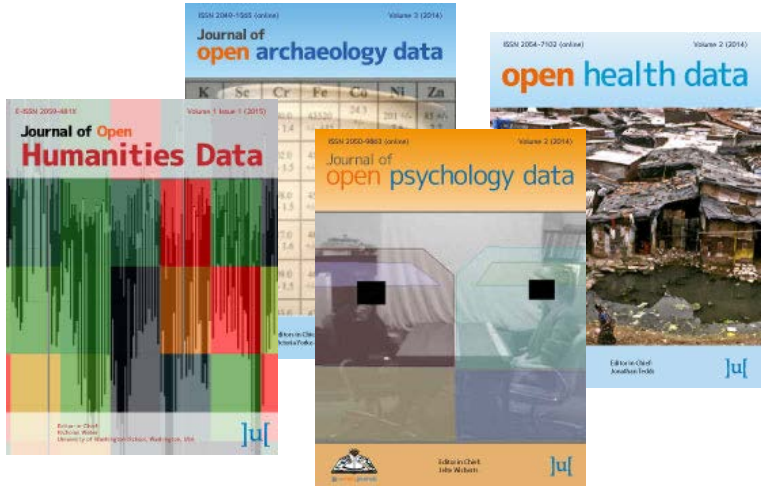
Data Journal = Paper + Datasets + PID

An 18-yr long (1993–2011) snow and meteorological dataset from a mid-altitude mountain site (Col de Porte, France, 1325 m alt.) for driving and evaluating snowpack models

S. Morin, Y. Lejeune, B. Lesaffre, J.-M. Panel, D. Poncet, P. David, and M. Sudul

Page(s) 13-21

Abstract | Final Revised Paper (PDF, 2559 KB) | Supplement (14997 KB) | Discussion Paper (ESSDD)



CODATA DATA SCIENCE Journal

npg nature publishing group SCIENTIFIC DATA

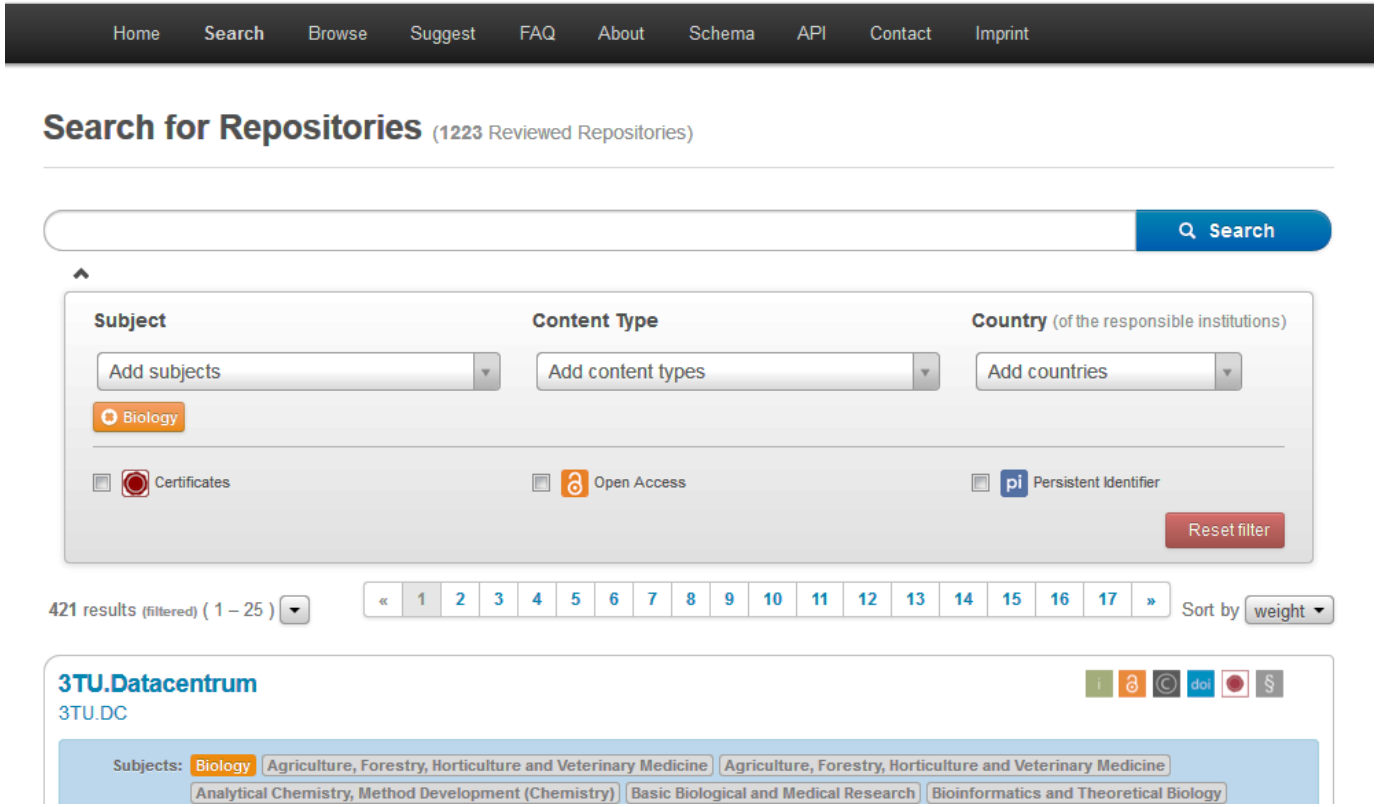
List of Data Journals: https://www.researchdata.uni-jena.de/Information/Datenpublikation.html

Data Repositories

Data repository = Datasets + Metadata + PID

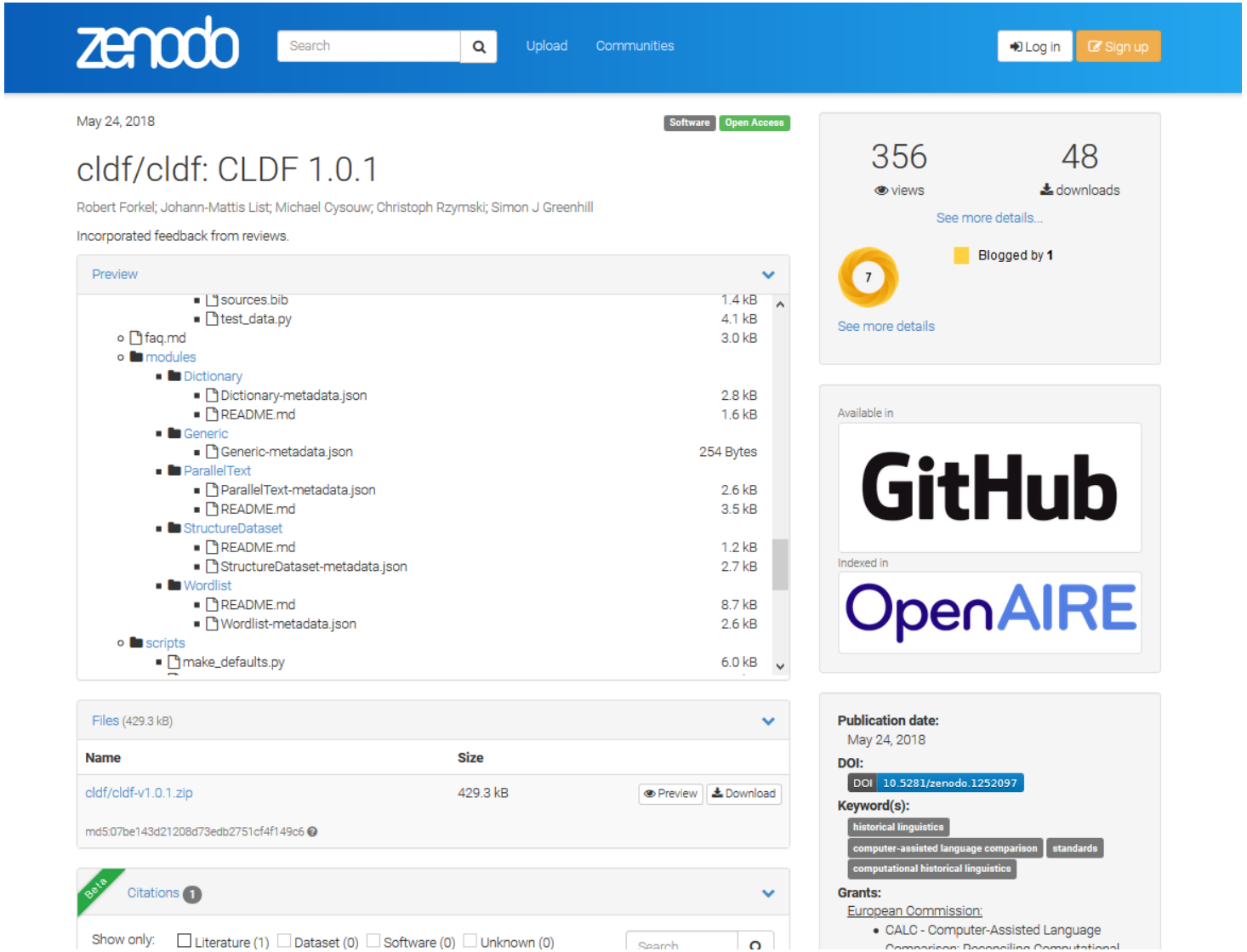
Search Engine for Repositories

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES



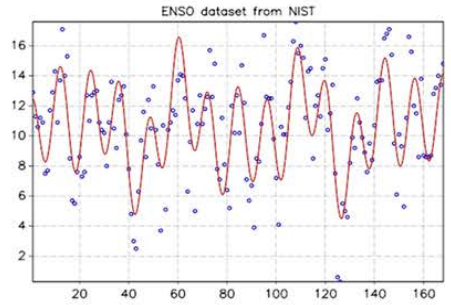
ZENODO & GitHub

- Push your GitHub repo to Zenodo and get a DOI = make it citable and reusable



Identification: Digital Object Identifier (DOI) - Example

1. Take a dataset



2. Describe it

- Title
- Authors
- Year
- Description
- And others…

3. Assign a DOI

doi®

10.1234/exampledata

4. Reuse and reference!

ATLAS Collaboration, "Data from Figure 7 from: Measurements of Higgs boson production and couplings in diboson final states with the ATLAS detector at the LHC: $H \to \gamma\gamma$,"
http://doi.org/10.7484/INSPIREHEP.DATA.A78C.HK44

☑ Unique ☑ Persistent

5. Enjoy the benefits

Findability	Track citations
Reusability	Measure impact

Slide by DataCite FIND, ACCESS, AND REUSE DATA

https://support.datacite.org/docs/doi-basics

Other Persistent Identifiers (PIDs)

Researcher identifier: **ORCID** (Open Researcher & Contributor ID)

- Central registry of unique identifiers for individual researchers to address author name ambiguity
- Transparent linking mechanism between ORCID and other author ID schemes
- https://orcid.org/

More on PIDs

the PID Forum

What are Persistent Identifiers?

Knowledge Hub ■ Getting Started with PIDs pid-basics

maddenfc FREYA 3 Mar '19

A persistent identifier (PID) is a long-lasting reference to a resource. That resource might be a publication, dataset or person. Equally it could be a scientific sample, funding body, set of geographical coordinates, unpublished report or piece of software.

Whatever it is, the primary purpose of the PID is to provide the information required to reliably identify, verify and locate it. A PID may be connected to a set of metadata describing an item rather than to the item itself.

There are different PID types for different kinds of resources. In the current research environment we most commonly see two varieties: those for objects (publications, data, software) and those for people (researchers, authors, contributors).

Useful Links

- What are Persistent Identifiers and why are they Important? by Jonathan Clark 21
- Persistent identifiers: current features and future properties by Juha Hakala 16
- ANDS Guide to persistent identifiers: awareness level 12
- ANDS Guide to persistent identifiers: expert level 2
- ANDS Webinar series on persistent identifiers 3

https://www.pidforum.org/t/what-are-persistent-identifiers/295

https://doi.org/10.1371/journal.pbio.2001414

Data Citation of Evolving Data

Recommendations of the Working Group on Data Citation (WGDC)

Andreas Rauber, Ari Asmi, Dieter van Uytvanck and Stefan Pröll

Revision of October 20th 2015

I. Making Data Citable

These WGDC recommendations enable researchers and data centers to identify and cite data used in experiments and studies. Instead of providing static data exports or textual descriptions of data subsets, we support a dynamic, query centric view of data sets. The proposed solution enables precise identification of the very subset and version of data used, supporting reproducibility of processes, sharing and reuse of data.

Goals of this WG are to create identification mechanisms that:

- allows us to identify and cite arbitrary views of data, from a single record to an entire data set in a precise, machine-actionable manner

A. Preparing the Data and the Query Store

Prepare existing data sources and provide the required infrastructure, which is needed for implementing the query based approach.

- **R1 – Data Versioning**: Apply versioning to ensure earlier states of data sets can be retrieved.
- **R2 – Timestamping**: Ensure that operations on data are timestamped, i.e. any additions, deletions are marked with a timestamp.
- **R3 – Query Store Facilities**: Provide means for storing queries and the associated metadata in order to re-execute them in the future.

B. Persistently Identify Specific Data Sets

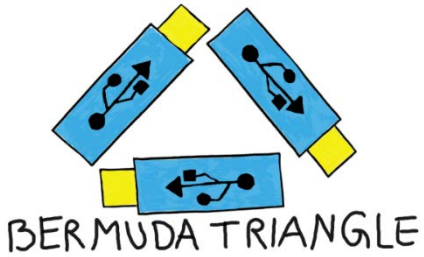
When a data set should be persisted, the following steps need to be applied:

- **R4 – Query Uniqueness**: Re-write the query to a

http://dx.doi.org/10.15497/RDA00016

Data Preservation/Archiving

Data Archiving



- After project completion, data which is no longer required should be stored in an archivable file format.
- at least in an archive folder at a different location, but better at an archive server (audit-proof and irreversible storage of data)
- Good scientific practice: **ALL** data shall be securely stored for **10 years** in a durable form
- Data selections for long-term archiving (for eternity)
  - basis of a published research paper
  - irretrievable measurements & observations
  - expensive to sample/collect
  - milestones

Rex (2019)

Aspects of Archiving

Maintenance of data content	• bitstream preservation
Maintenance of functionality	• migration • emulation
Maintenance of usability	• documentation • metadata

Rex (2019)

File Formats I

Suitable for long-term archiving:

- unencrypted, uncompressed, unpatented/non-proprietary, standardized, ideally open
- If data are stored in a proprietary format (format of original software), they should be always additionally stored in an open/archivable format.
- (long-term) archiving takes time (documentation, meta data) and money (infrastructure). Plan at an early stage!

Rex (2019)

File Formats II

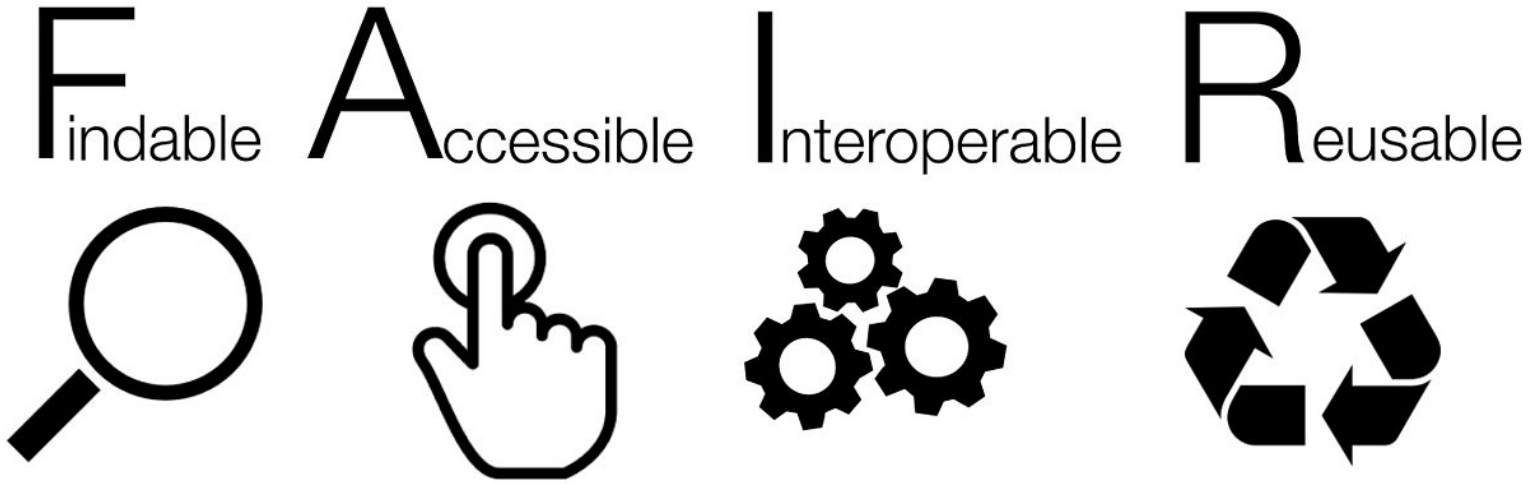
File Type	Recommendation	Do not use
Tables	CSV, TSV, SPSS portable	Excel
Text	TXT, ODT, HTML, RTF, PDF/A only if layout is important	Word, Powerpoint
Multimedia	Container: MP4, Ogg Codec: Theora, Dirac, FLAC	QuickTime, H264
Pictures	TIFF, JPEG2000, PNG	GIF, JPG
Structured Data	XML, RDF, JSON	RDBMS

Helbig (2017)

More information:
https://www.forschungsdaten.info/themen/bewahren-und-nachnutzen/formate-erhalten/

FAIR Principles & Implementation

FAIR Data



- **Not only for publication of data, but also internally! (e.g. for yourself, colleagues, collaborators)**

Box 2 | The FAIR Guiding Principles

To be Findable:
F1. (meta)data are assigned a globally unique and persistent identifier
F2. data are described with rich metadata (defined by R1 below)
F3. metadata clearly and explicitly include the identifier of the data it describes
F4. (meta)data are registered or indexed in a searchable resource

To be Accessible:
A1. (meta)data are retrievable by their identifier using a standardized communications protocol
A1.1 the protocol is open, free, and universally implementable
A1.2 the protocol allows for an authentication and authorization procedure, where necessary
A2. metadata are accessible, even when the data are no longer available

To be Interoperable:
I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
I2. (meta)data use vocabularies that follow FAIR principles
I3. (meta)data include qualified references to other (meta)data

To be Reusable:
R1. meta(data) are richly described with a plurality of accurate and relevant attributes
R1.1. (meta)data are released with a clear and accessible data usage license
R1.2. (meta)data are associated with detailed provenance
R1.3. (meta)data meet domain-relevant community standards

Slide by Eric Schultes, GO FAIR DCSS IN Workshop Leiden 18/12/2019; https://drive.google.com/file/d/1G_bcUhsAyVG3SFZMoBnoJ59M-2zIqR9K/view

Technical infrastructure (generic operations)
Data / social agreements (domain-specific content)

Box 2 | The FAIR Guiding Principles

To be Findable:
F1. (meta)data are assigned a globally unique and persistent identifier
F2. data are described with rich metadata (defined by R1 below)
F3. metadata clearly and explicitly include the identifier of the data it describes
F4. (meta)data are registered or indexed in a searchable resource

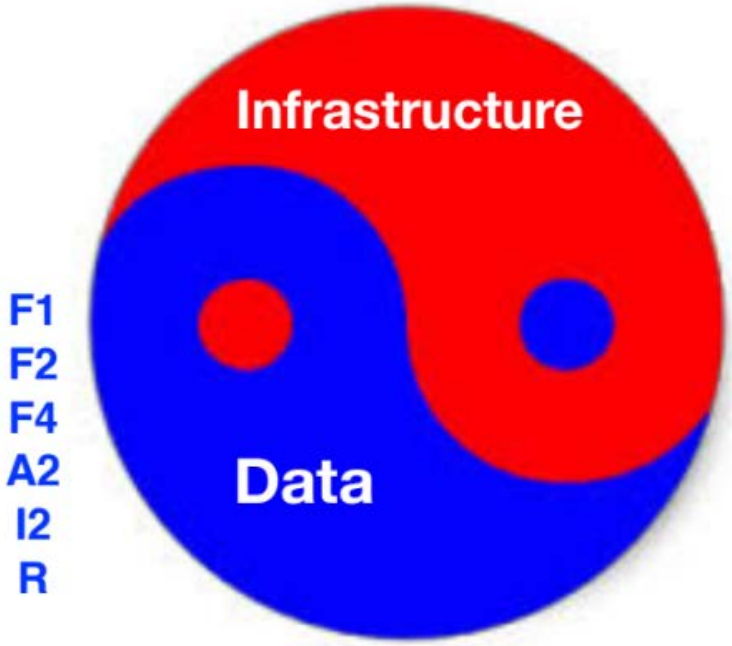
To be Accessible:
A1. (meta)data are retrievable by their identifier using a standardized communications protocol
A1.1 the protocol is open, free, and universally implementable
A1.2 the protocol allows for an authentication and authorization procedure, where necessary
A2. metadata are accessible, even when the data are no longer available

To be Interoperable:
I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
I2. (meta)data use vocabularies that follow FAIR principles
I3. (meta)data include qualified references to other (meta)data

To be Reusable:
R1. meta(data) are richly described with a plurality of accurate and relevant attributes
R1.1. (meta)data are released with a clear and accessible data usage license
R1.2. (meta)data are associated with detailed provenance
R1.3. (meta)data meet domain-relevant community standards

Slide by Eric Schultes, GO FAIR DCSS IN Workshop Leiden 18/12/2019; https://drive.google.com/file/d/1G_bcUhsAyVG3SFZMoBnoJ59M-2zIqR9K/view

There are no fundamental technology barriers to FAIR



- Repositories
- FAIR Data Point
- FAIR Digital Objects

The hard problems are social

- Community Agreements
- Choices

Slide by Eric Schultes, GO FAIR DCSS IN Workshop Leiden 18/12/2019; https://drive.google.com/file/d/1G_bcUhsAyVG3SFZMoBnoJ59M-2zIqR9K/view

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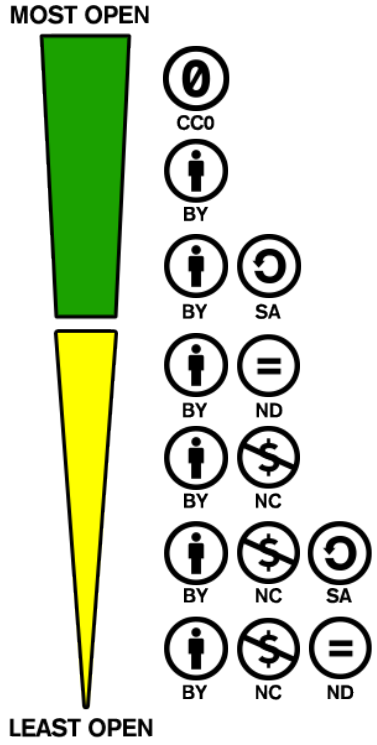


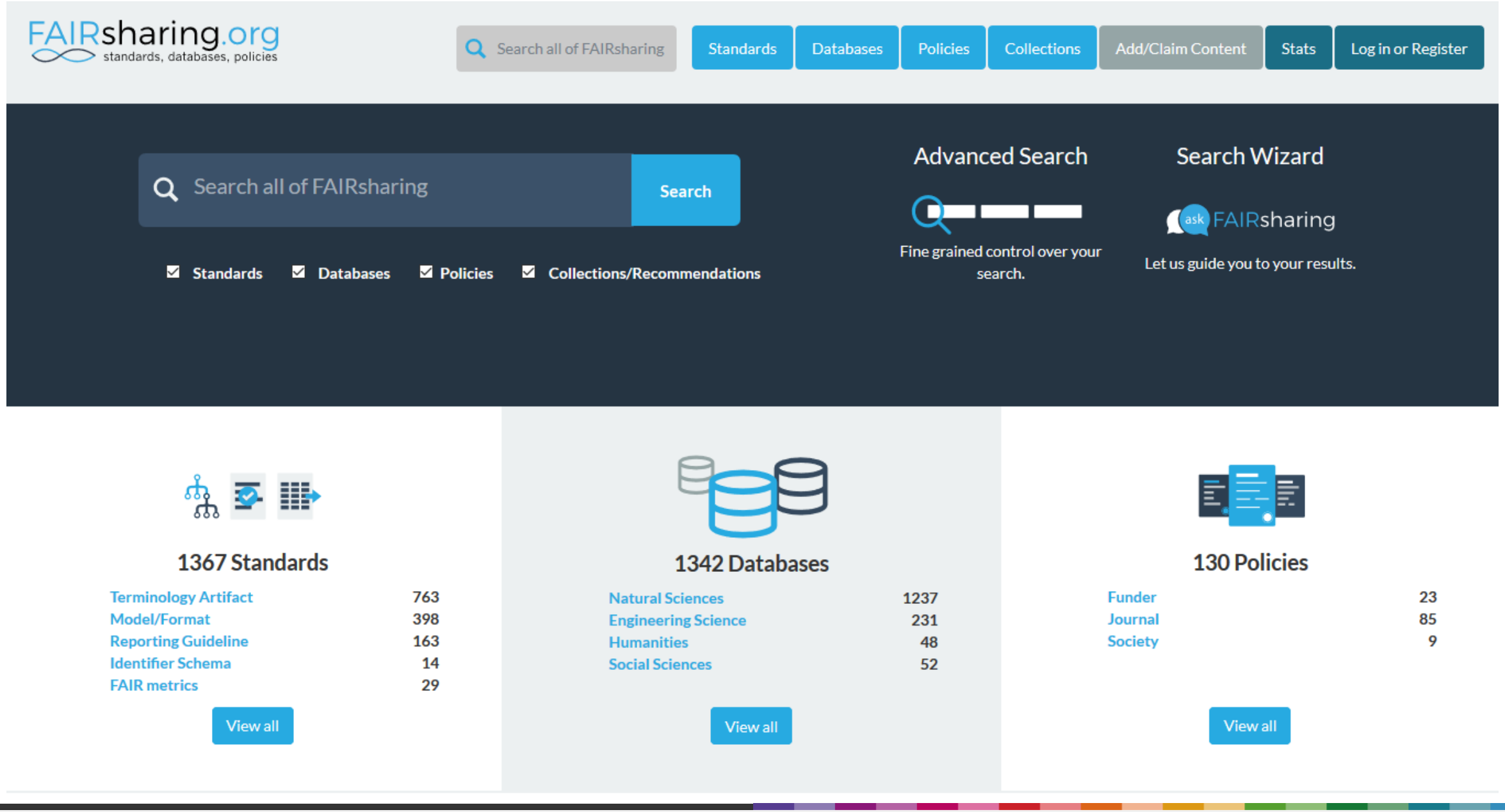
creativecommons.org,
CC BY 4.0

Only version 4.0 of:

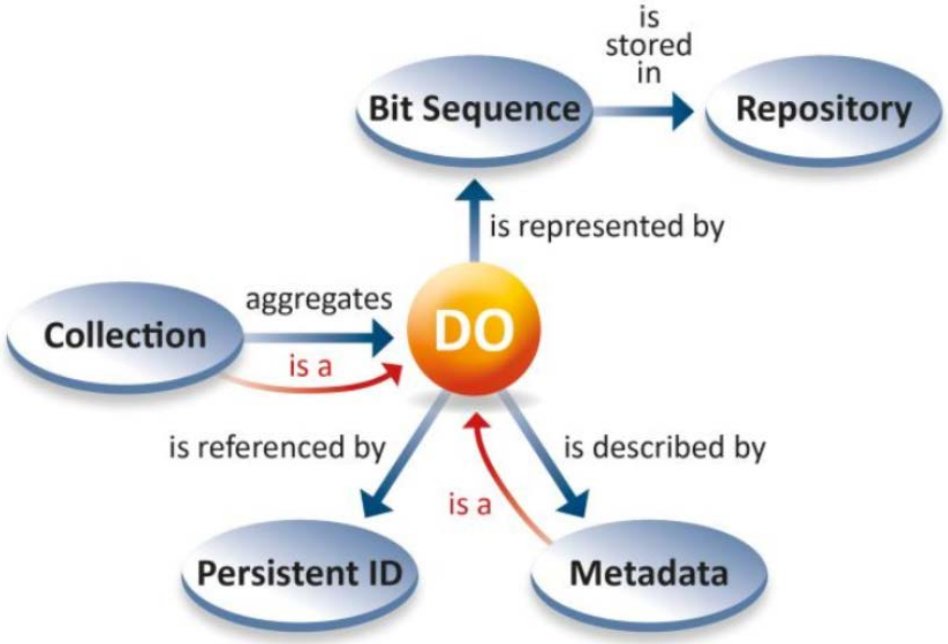
- CC0
- CC-BY
- CC-SA

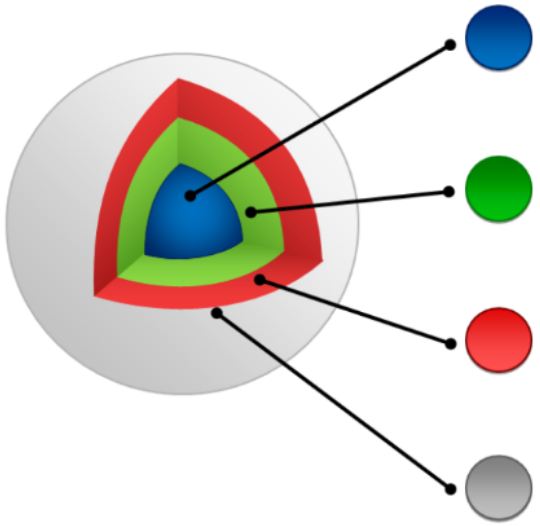
conform to the Open Definition (i.e. Open Access)

http://opendefinition.org/od/2.1/en/


FAIRsharing.org
standards, databases, policies
Search all of FAIRsharing
Standards
Databases
Policies
Collections
Add/Claim Content
Stats
Log in or Register
Search all of FAIRsharing
Search
Standards
Databases
Policies
Collections/Recommendations
Advanced Search
Fine grained control over your search.
Search Wizard
ask FAIRsharing
Let us guide you to your results.
1367 Standards
Terminology Artifact 763
Model/Format 398
Reporting Guideline 163
Identifier Schema 14
FAIR metrics 29
View all
1342 Databases
Natural Sciences 1237
Engineering Science 231
Humanities 48
Social Sciences 52
View all
130 Policies
Funder 23
Journal 85
Society 9
View all

From *Digital Objects* to *FAIR Data Objects*





DIGITAL OBJECT
Data, code and other research resources
At its most basic level, data or code is a bitstream or binary sequence. For this to have meaning and to be FAIR, it needs to be represented in standard formats and be accompanied by Persistent Identifiers (PIDs), metadata and documentation. These layers of meaning enrich the object and enable reuse.

IDENTIFIERS
Persistent and unique identifiers (PIDs)
Digital Objects should be assigned a unique and persistent identifier such as a DOI or URN. This enables stable links to the object and supports citation and reuse to be tracked. Identifiers should also be applied to other related concepts such as the data authors (ORCIDs), projects (RAIDs), funders and associated research resources (RRIDs).

STANDARDS & CODE
Open, documented formats
Digital Objects should be represented in common and ideally open file formats. This enables others to reuse them as the format is in widespread use and software is available to read the files. Open and well-documented formats are easier to preserve. Data also need to be accompanied by the code use to process and analyse the data.

METADATA
Contextual documentation
In order for Digital Objects to be assessable and reusable, they should be accompanied by sufficient metadata and documentation. Basic metadata will enable data discovery, but much richer information and provenance is required to understand how, why, when and by whom the objects were created. To enable the broadest reuse, they should be accompanied by a plurality of relevant attributes and a clear and accessible usage license.

Reference/recommended read:
https://github.com/GEDE-RDA-Europe/GEDE/blob/master/FAIR%20Digital%20Objects/do-fdo-papers/science-view-fdo-final.pdf
https://github.com/GEDE-RDA-Europe/GEDE/blob/master/Digital-Objects/Papers(finished)/Basic-DO/do-flavours-final.pdf

Nationale Forschungsdateninfrastruktur (NFDI)

National Research Data Infrastructure (NFDI)

The aim of the NFDI is to **systematically manage** scientific and **research data**, provide long-term **data storage**, **backup** and **accessibility**, and **network** the **data** both **nationally** and **internationally**.

The NFDI will bring multiple stakeholders together in a **coordinated network of consortia** tasked with providing science-driven **data services** to **research communities**.

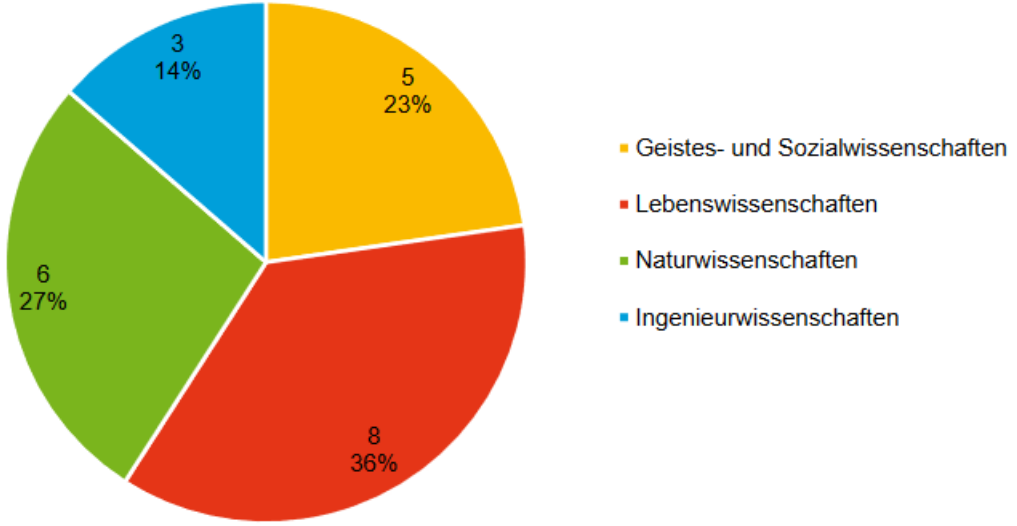
National Research Data Infrastructure (NFDI)

NFDI programme aims:

- Establishment of **data handling standards**, **procedures** and **guidelines** in close collaboration with the community of interest
- Development of **cross-disciplinary metadata standards**
- Development of **reliable** and **interoperable data management measures** and **services** tailored to the needs of the community of interest
- Increased **reusability** of **existing data**, also beyond subject boundaries
- Improved **networking** and **collaboration with partners outside the German academic** research system with expertise in research data management
- Involvement in developing and **establishing generic, cross-consortia services** and **standards** in research data management together with other consortia

National Research Data Infrastructure (NFDI)

- Up to 30 consortia
- 85 Mio. Euro per year
- 2-5 Mio. Euro per consortia for 5 years
- 22 proposals submitted in 2019
- 26. Juni 2020 decision published for the first round



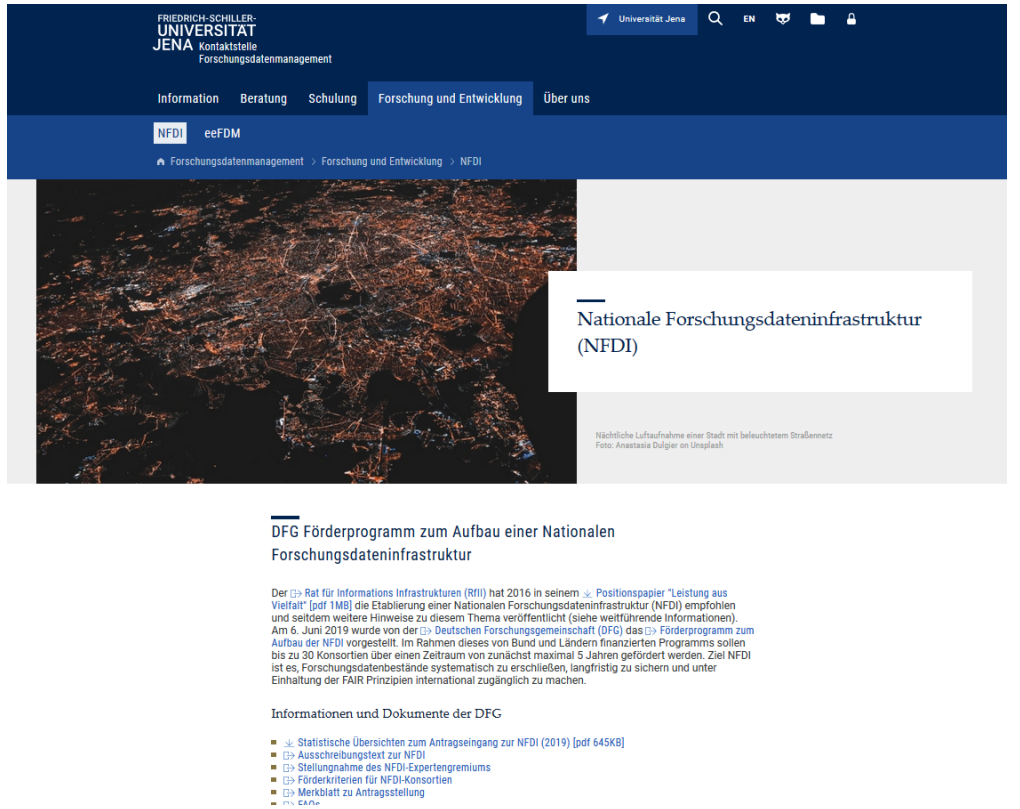
https://www.dfg.de/download/pdf/foerderung/programme/nfdi/191212_nfdi_statistik_antragseingang.pdf

Übersicht über NFDI-Konsortien

Konsortium	Antragsrunde	Absichtserklärung	Webseite	Thüringer Vertreter*
Astro@NFDI	2019	Link	Link	Matthias Hoeft
BERD@NFDI	2019	Link	Link	-
DAPHNE NFDI	2019	Link	-	-
DataPLANT	2019	Link	-	-
FAIRmat	2019	Link	Link	Silvana Botti
ForumX	2019	Link	Link	
GHGA	2019	Link		-
KonsortSWD	2019	Link	Link	-
MaRDI	2019	Link	Link	-
NFDI4Agri	2019	Link	Link	-
NFDI4BioDiversity	2019	Link	Link	Birgitta König-Ries, Aletta Bonn
NFDI4cat	2019	Link	Link	-
NFDI4Chem	2019	Link	Link	Christoph Steinbeck
NFDI4Culture	2019	Link	Link	-
NFDI4Earth	2019	Link	Link	Miguel Mahecha, Markus Reichstein
NFDI4Health	2019	Link	Link	-
NFDI4Ing	2019	Link	Link	-
NFDI4Medicine	2019	Link	-	Andre Scherag, Michael Kiehntopf
NFDI4MobilTech	2019	Link	-	-
NFDI4MSE	2019	Link	Link	-
PAHN-PaN	2019	Link	Link	Stephan Fritzsche, Andre Stembeck, Thomas Stöhker
Text+	2019	Link	-	-
2linkNFDI	2020	Link	Link	-
Bridge4NFDI	2020	Link	Link	-

https://www.researchdata.uni-jena.de/Forschung+und+Entwicklung/NFDI/NFDI_Konsortien-p-315.html

National Research Data Infrastructure (NFDI)



https://www.dfg.de/foerderung/programme/nfdi/

https://www.researchdata.uni-jena.de/Forschung+und+Entwicklung/NFDI.html

European Open Science Cloud

Some Links …

DARIAH-DE

https://de.dariah.eu/daten

CLARIN for Researchers

https://www.clarin.eu/content/clarin-for-researchers

UK Data Service

https://www.ukdataservice.ac.uk/manage-data.aspx

MANTRA Data Management Plans

https://mantra.edina.ac.uk/datamanagementplans/

Some Links …

João Luiz Rebelo Moreira, Luiz Bonino, Luís Ferreira Pires, Marten van Sinderen, Patricia Henning, 2019, Towards Findable, Accessible, Interoperable and Reusable (FAIR) Data Repositories: Improving a Data Repository to Behave as a FAIR Data Point. https://doi.org/10.18617/liinc.v15i2.4817

Wilkinson, M. D. et al. A design framework and exemplar metrics for FAIRness. Sci. Data 5:180118 doi: 10.1038/sdata.2018.118 (2018).

Turning FAIR into reality, Final report and action plan from the European Commission expert group on FAIR data (2018), DOI: 10.2777/1524

Thanks for joining!

Questions?

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Please, quote as follows:

Gerlach, Roman, Hesse, Bettina, König-Ries, Birgitta, Schröter, Annett, Rzymski, Christoph, Schwartze, Volker, Steiner, Petra u. Olena Tykhostup (2020). *What's on in Research Data Management?*. Presentation by Roman Gerlach on 29/01/2020 at „Reproducible Research and Data Management workshop" at the Max Planck Institute for the Science of Human History.

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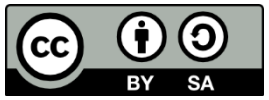

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