Open Access and Open Science at the MLU

Introduction Seminar for Zoologists at the MLU ”

Dr. Roberto Cozatl and Michael Hoffert

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UNIVERSITÄTS- UND
LANDESBIBLIOTHEK
SACHSEN - ANHALT

Introduction

- Concept and organisational information

- The speakers

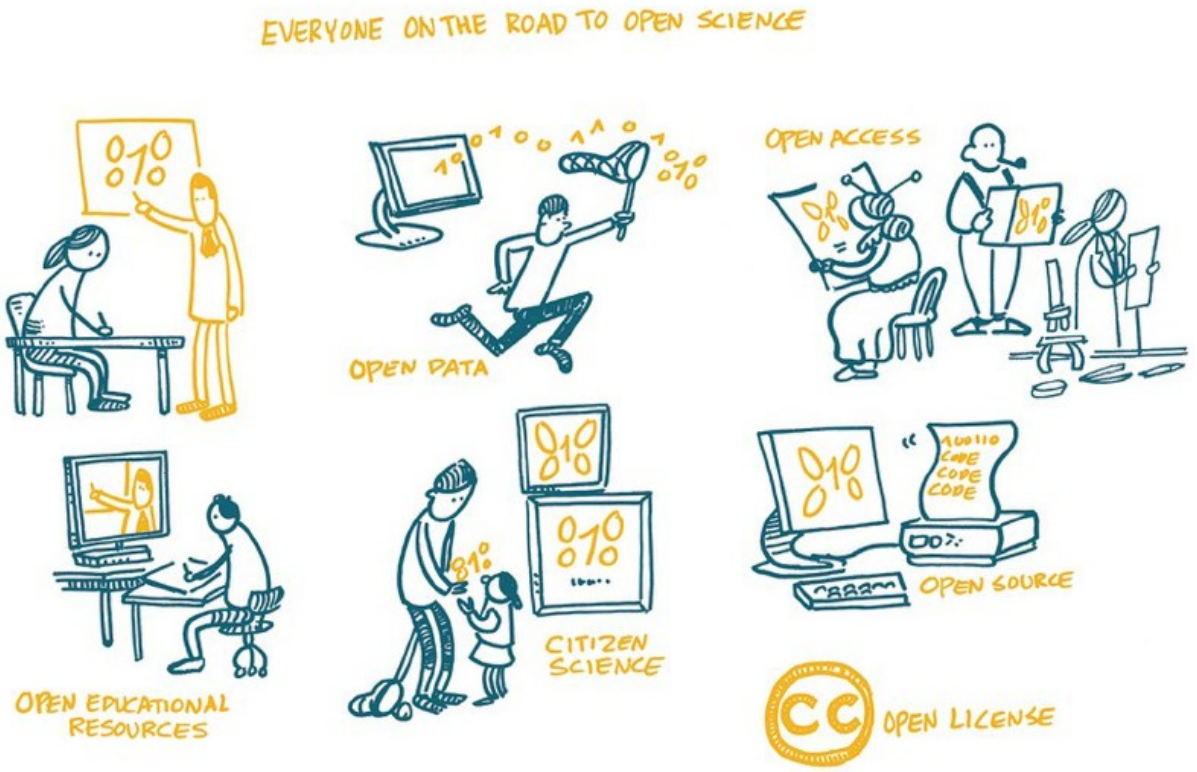
Dr. Roberto Cozatl – Head of the Open Science Team, ULB

Michael Hoffert – Subject Specialist for Biology, ULB

Overview

- Open Science
- Introduction to Open Access publishing
- Infrastructural and financial support
- A primer on research data management
- FAIR Data
- NFDI

What is Open Science?



On the road to Open Science (Patrick Hochstenbach CC-BY 4.0)

- "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**

- " OS is the practice of science in ways that others can collaborate and contribute, where research data and processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods ". **FOSTER.EU**

Why is Open Science important?

- From a non-academic perspective open science can benift the economy and our society in many ways:
    - Innovation motor for businness
    - Positive impact on society and public policy and health
    - Benefits for culture and the environment

Why is Open Science important?

- From a non-academic perspective open science can benift the economy and our society in many ways:
    - Innovation motor for businness
    - Positive impact on society and public policy and health
    - Benefits for culture and the environment
- From a scientific perspective the benefits from OS are also diverse:
    - Eases scientific collaboration
    - Makes science more transparent and reproducible
    - Advances the analytical capacities at the core of scientific processes
    - Supports data driven decision making
    - Citation advantage effect
    - If implemented wisely, it will make your scientific work more efficient

Open Science as an initiative

- **Mandate**: through government, society, the private and academic sector, etc.
- **Demand**: people in different context are actually using and benefiting from OS and its derivates such as Open Access and Open Data
- **Engagement**: there are active communities (data users, creators) and structured mechanisms to get feedback and to evaluate the ongoing processes and achieved goals
- **Cultural Change**: existing challenges are being dealt with by the active communities, and these developments are changing the way science is done.

Terminology

- **Open Materials**: your research methods (including protocols and processes) are openly available
- **Open Source**: public availability of programming code and scripts
- **Open Data**: public availability of research data (additional and or supplementary materials)
- **Open Access**: public (free of charge!) availability of research publications
- **Preregistration**: open registration of study and experimental designs

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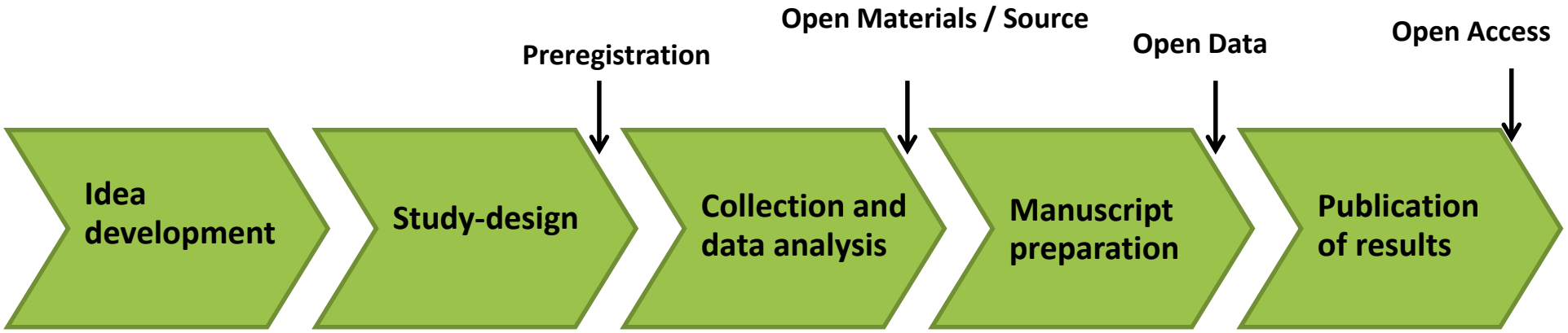
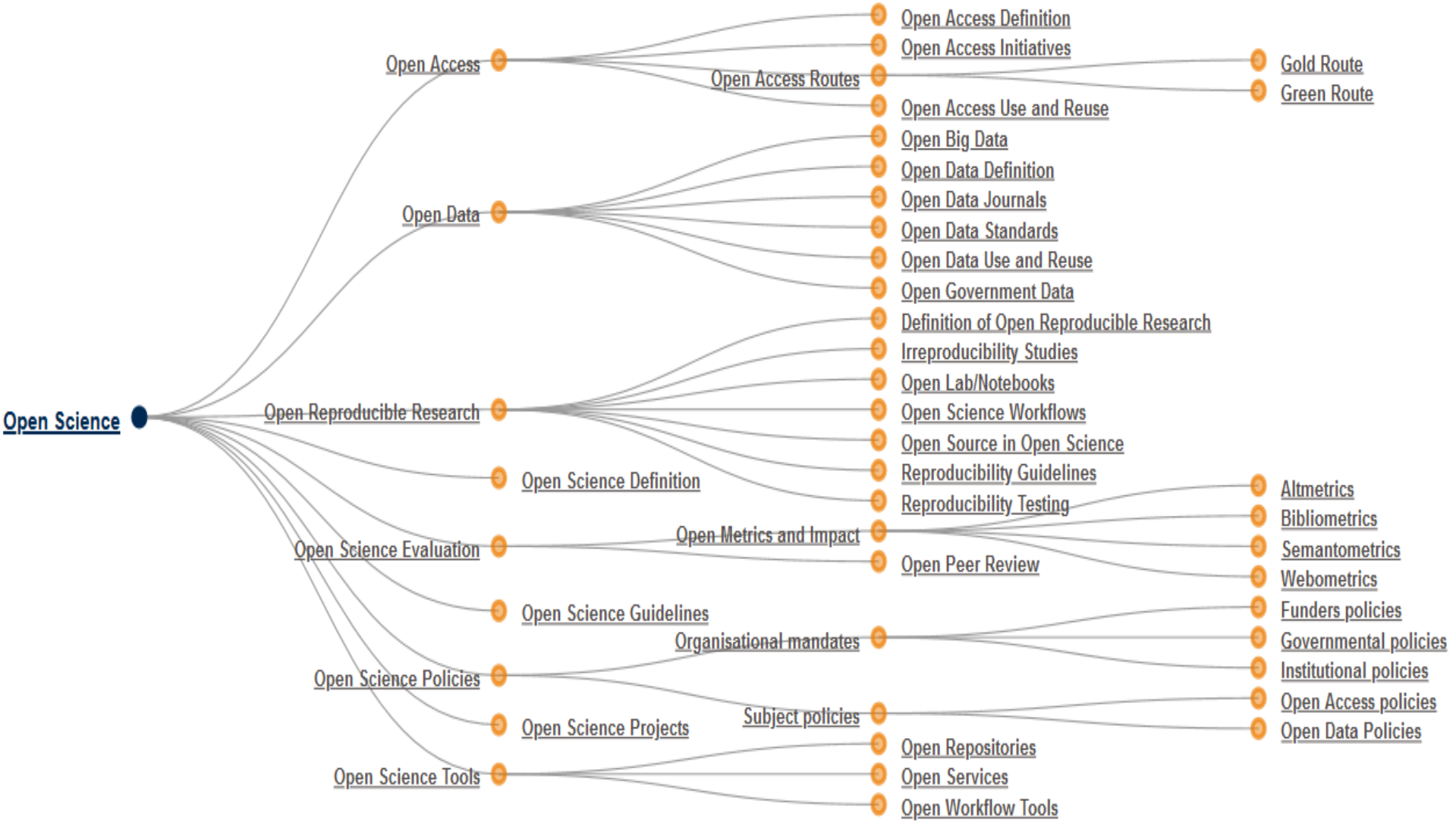


Adapted from : Open Science-Seminar von Dr. A. Kohler GRADE-Frankfurt: https://osf.io/8b657/



Adapted from : Open Science-Seminar von Dr. A. Kohler GRADE-Frankfurt: https://osf.io/8b657/

Source: https://www.fosteropenscience.eu/taxonomy/term/100

Introduction to Open Access

Open Access

- General idea
- Current developments

The legal framework in Germany

- Legal basis of publishing contracts
- Current stand and implications

Tips (important things to consider) for publishing your scientific outputs

- Predatory Journals

Financial Support and our infrastructure

- Publication fund of the MLU
- Our institutional repository and other publishing tools

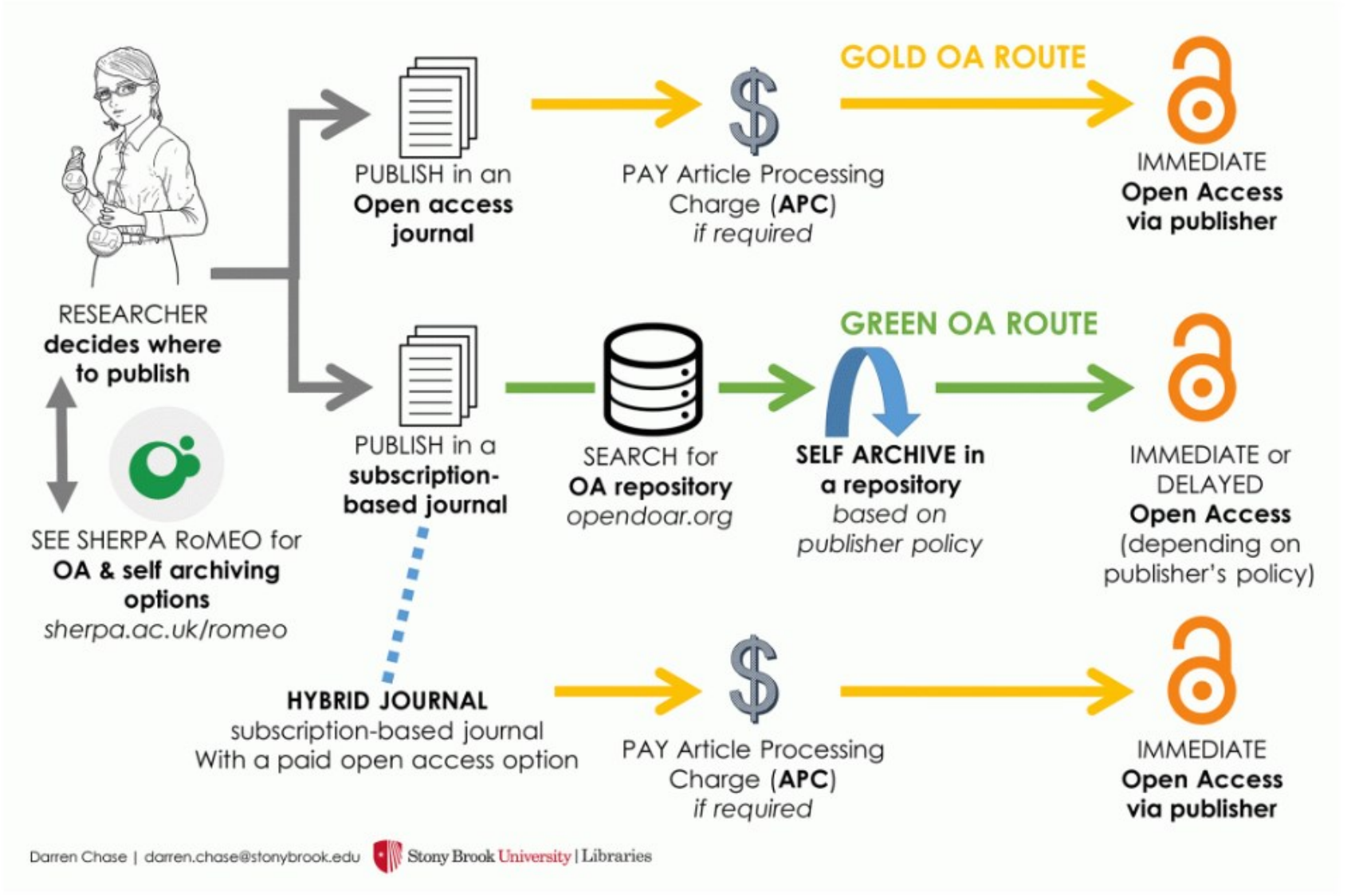
Open Access

Publish your research results in open access whenever it is possible for you!

Gold OA: this refers to works published in OA journals accessed directly via the journals or publishers website.

Green OA: refers to self-archiving or works for free public use. Authors provide access to these materials over an institutional or discipline-specific repository.

*** https://www.fosteropenscience.eu/**

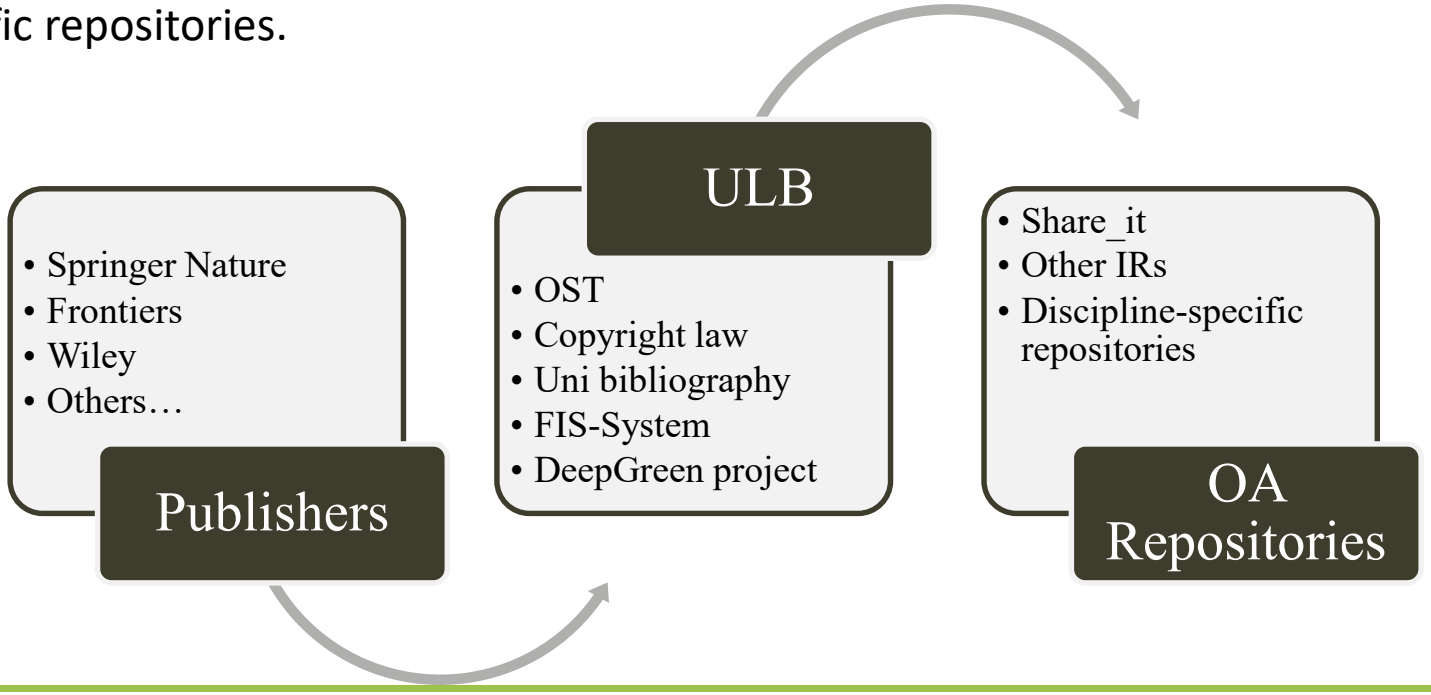

GOLD OA ROUTE
RESEARCHER
decides where
to publish
PUBLISH in an
Open access
journal
PAY Article Processing
Charge (APC)
if required
IMMEDIATE
Open Access
via publisher
GREEN OA ROUTE
PUBLISH in a
subscription-
based journal
SEARCH for
OA repository
opendoar.org
SELF ARCHIVE in
a repository
based on
publisher policy
IMMEDIATE or
DELAYED
Open Access
(depending on
publisher's policy)
SEE SHERPA RoMEO for
OA & self archiving
options
sherpa.ac.uk/romeo
HYBRID JOURNAL
subscription-based journal
With a paid open access option
PAY Article Processing
Charge (APC)
if required
IMMEDIATE
Open Access
via publisher
Darren Chase | darren.chase@stonybrook.edu
Stony Brook University | Libraries

Fostering of secondary publications

- Secondary publishing means archiving and accessing already published, peer-reviewed research works as parallel publication (Green Open Access) on document servers (repositories).

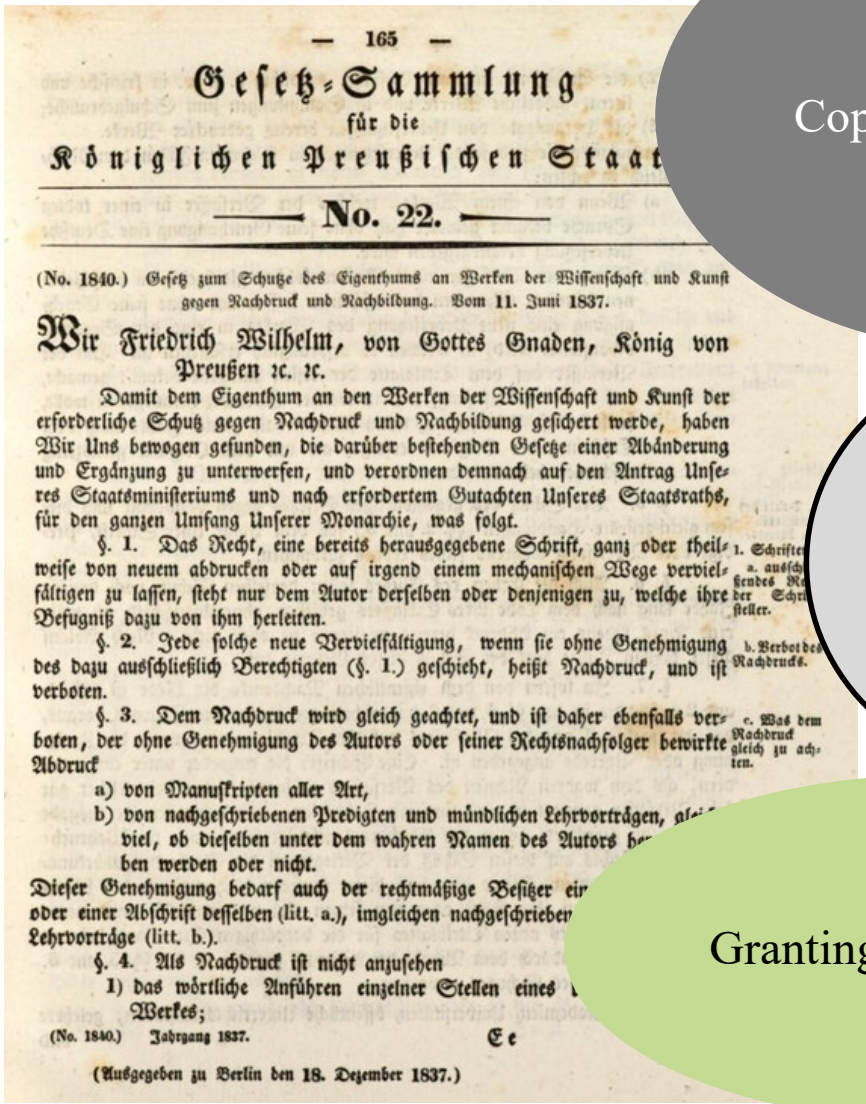
- It aims at improving the accessibility of publications that could not be originally published in Open Access mode.

- The ULB provides you with an option to submit your works as secondary publication to our institutional repository Share_it. We can also help you find adequate discipline-specific repositories.



The legal framework in Germany

German authors‘ right | Deutsches Urheberrecht



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Gesetz-Sammlung
für die
Königlichen Preußischen Staat

No. 22.

(No. 1840.) Gesetz zum Schutze des Eigenthums an Werken der Wissenschaft und Kunst gegen Nachdruck und Nachbildung. Vom 11. Juni 1837.

Wir Friedrich Wilhelm, von Gottes Gnaden, König von Preußen ꝛc. ꝛc.

Damit dem Eigenthum an den Werken der Wissenschaft und Kunst der erforderliche Schutz gegen Nachdruck und Nachbildung gesichert werde, haben Wir Uns bewogen gefunden, die darüber bestehenden Gesetze einer Abänderung und Ergänzung zu unterwerfen, und verordnen demnach auf den Antrag Unseres Staatsministeriums und nach erfordertem Gutachten Unseres Staatsraths, für den ganzen Umfang Unserer Monarchie, was folgt.

§. 1. Das Recht, eine bereits herausgegebene Schrift, ganz oder theilweise von neuem abdrucken oder auf irgend einem mechanischen Wege vervielfältigen zu lassen, steht nur dem Autor derselben oder denjenigen zu, welche ihre Befugniß dazu von ihm herleiten. 1. Schriftsteller. a. ausschließendes Recht der Schriftsteller.

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§. 3. Dem Nachdruck wird gleich geachtet, und ist daher ebenfalls verboten, der ohne Genehmigung des Autors oder seiner Rechtsnachfolger bewirkte Abdruck c. Was dem Nachdruck gleich zu achten.

a) von Manuskripten aller Art,

b) von nachgeschriebenen Predigten und mündlichen Lehrvorträgen, gleichviel, ob dieselben unter dem wahren Namen des Autors herausgegeben werden oder nicht.

Dieser Genehmigung bedarf auch der rechtmäßige Besitzer eines Manuskripts oder einer Abschrift desselben (litt. a.), imgleichen nachgeschriebener mündlicher Lehrvorträge (litt. b.).

§. 4. Als Nachdruck ist nicht anzusehen

1) das wörtliche Anführen einzelner Stellen eines Werkes;

(No. 1840.) Jahrgang 1837. Ee

(Ausgegeben zu Berlin den 18. Dezember 1837.)

Copyright protection

What: § 2 Sect. 7
Who: § 7
How: § 64

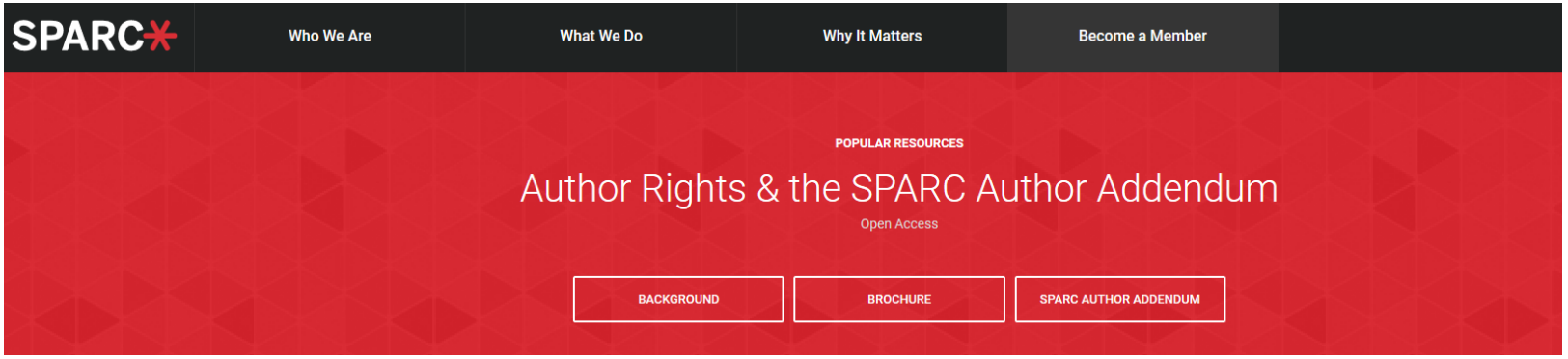
Authors‘ rights

Copyright personal rights: § 12-14
Exploitation rights: § 16 - 19

Granting of usage rights

Usage rights/ transferring copyrights: § 31

* Pictured: First page of the Prussian law of June 11, 1837: from Wikimedia Commons



SPARC (the Scholarly Publishing and Academic Resources Coalition) works to enable the open sharing of research outputs and educational materials in order to democratize access to knowledge, accelerate discovery, and increase the return on our investment in research and education.

Rechtsfragen bei Open Science – Ein Leitfaden
Hamburg University Press

Open Science @ULB

https://openscience.bibliothek.uni-halle.de
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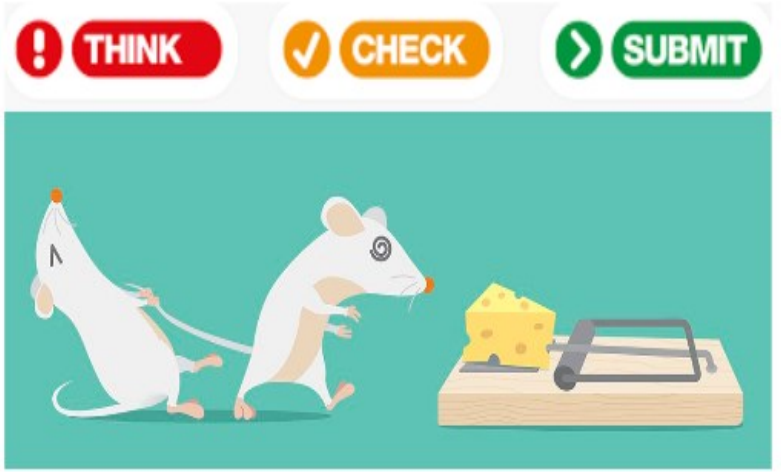
Predatory publishing

- **Definition:**

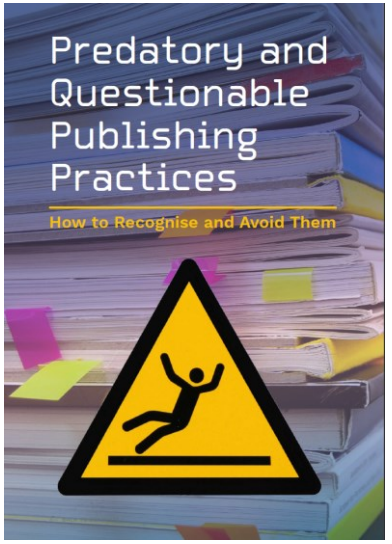
Publishers who prioritize self economic interests at the expense of scholarship

- **Characteristics:**
  - Misleading information
  - Deviation from best editorial practices
  - Lack of transparency
  - Aggressive marketing stratetegies to win authors
  - Badly indexed content in scientific databases
- **Risks:**
  - Low findability and accesibility of your research
  - Damaged scientific reputation
  - Discrediting of the OA initiative
  - Supporting of illegitimate business models

- **Important checks**
    - Directory of Open Access Journals
    - Open Access Scholarly Publisher Association
    - Web of Science or Scopus Index



- **Further consultation**
    - OS Team of the library!
    - Thinkchecksubmit webiste



Braak, P., van Gorp, D., Hukkelhoven, C., & de Roo, T. (2024). Predatory and Questionable Publishing Practices: How to Recognise and Avoid Them. UKB - Dutch Consortium of University Libraries. https://doi.org/10.5281/zenodo.10688081

Publication fund of the MLU

The publication fund of the MLU supports the Open Access efforts of MLU and University clinic scientific staff by covering the article processing changes (APCs) incurred by publising in Open Access journals

Applying for funding is done in three steps:

1. Check your eligibility
2. Send the application form to the ULB
3. After clearance, the ULB pays the APCs for your publication

(a maximum of 2000 EUR per article are covered under this scheme)

Further Information can be found here:
https://bibliothek.uni-halle.de/wp-content/uploads/2023/11/openaccess_fk_engl.pdf

Eligibility criteria and further details about the application process:

https://bibliothek.uni-halle.de/en/research-publish/open-access/publication-fund/publiation-fund-article/

Promotion of Open Access within Transformational agreements with Springer Nature, Wiley, Elsevier and others

In Addition to funding Gold Open Access publications via the publication fund, we also signed transformational agreements with some publishers:

Requirements:

- If you are the corresponding author, you are allowed to publish without additional costs in most of the hybrid journals of the publisher (for details please contact the Open Science Team of the ULB or the responsible subject specialist).

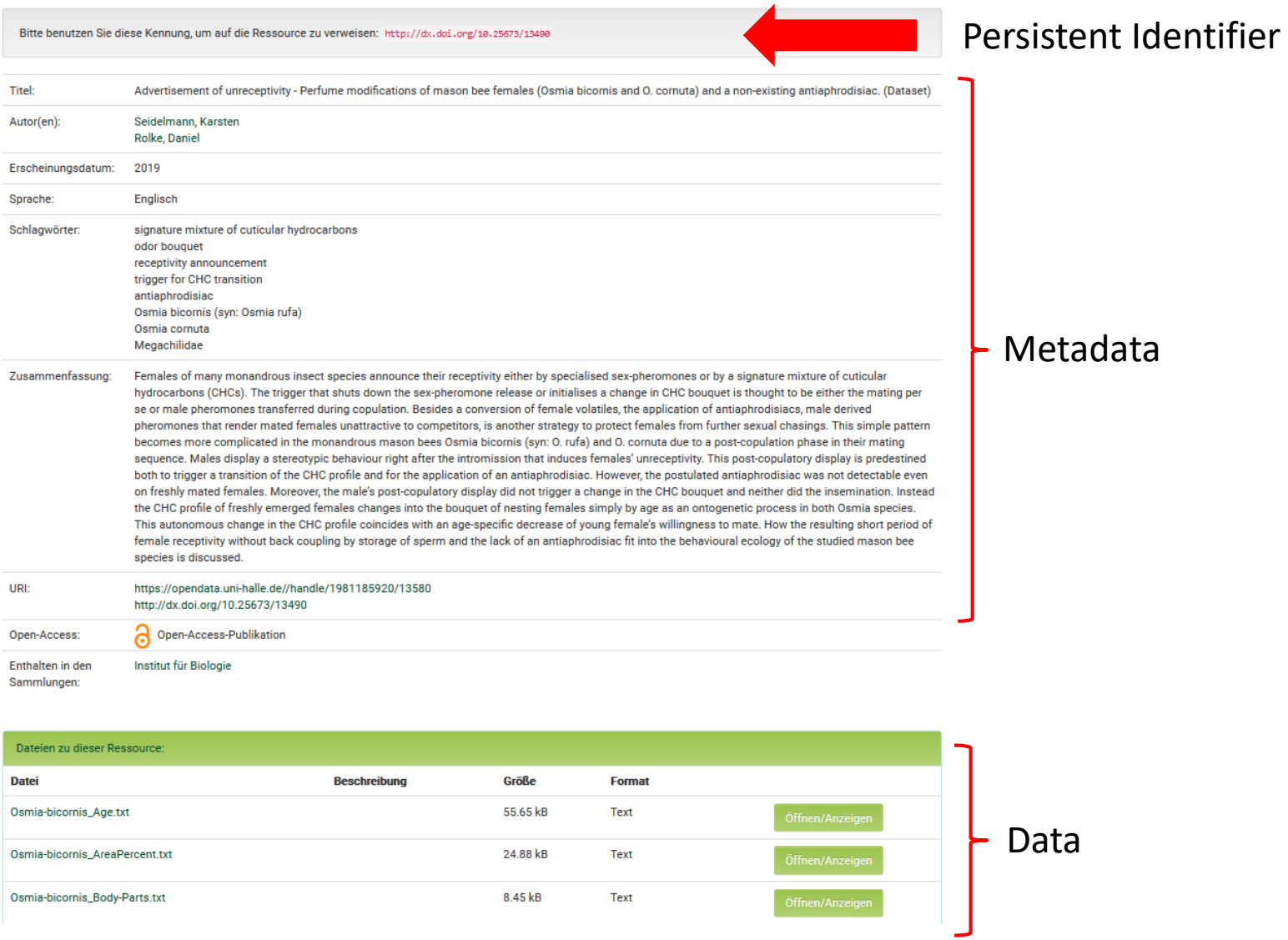
- An overview page about this transformational agreements can be found here: https://bibliothek.uni-halle.de/en/research-publish/open-access/transformative-agreements/

- Via these contracts you will also receive a reduction of the APCs for articles in Gold Open Access journals of these publishers.

Our publications and research data repository : Share_it

- System for the storage, archiving and dissemination of publications, research data and research results
- Permanent identification of resources via DOIs for citability and long-term archiving
- Share_it: Repository of the University Libraries of Saxony-Anhalt
- Part of the IT infrastructure of MLU
- DINI-certified repository (Important standards are met)
- Connection to larger online aggregators (DNB, BASE, Re3data)

Example of a publication in Share_it



Bitte benutzen Sie diese Kennung, um auf die Ressource zu verweisen: http://dx.doi.org/10.25673/13490

Persistent Identifier

Titel:	Advertisement of unreceptivity - Perfume modifications of mason bee females (Osmia bicornis and O. cornuta) and a non-existing antiaphrodisiac. (Dataset)
Autor(en):	Seidelmann, Karsten Rolke, Daniel
Erscheinungsdatum:	2019
Sprache:	Englisch
Schlagwörter:	signature mixture of cuticular hydrocarbons odor bouquet receptivity announcement trigger for CHC transition antiaphrodisiac Osmia bicornis (syn: Osmia rufa) Osmia cornuta Megachilidae
Zusammenfassung:	Females of many monandrous insect species announce their receptivity either by specialised sex-pheromones or by a signature mixture of cuticular hydrocarbons (CHCs). The trigger that shuts down the sex-pheromone release or initialises a change in CHC bouquet is thought to be either the mating per se or male pheromones transferred during copulation. Besides a conversion of female volatiles, the application of antiaphrodisiacs, male derived pheromones that render mated females unattractive to competitors, is another strategy to protect females from further sexual chasings. This simple pattern becomes more complicated in the monandrous mason bees Osmia bicornis (syn: O. rufa) and O. cornuta due to a post-copulation phase in their mating sequence. Males display a stereotypic behaviour right after the intromission that induces females' unreceptivity. This post-copulatory display is predestined both to trigger a transition of the CHC profile and for the application of an antiaphrodisiac. However, the postulated antiaphrodisiac was not detectable even on freshly mated females. Moreover, the male's post-copulatory display did not trigger a change in the CHC bouquet and neither did the insemination. Instead the CHC profile of freshly emerged females changes into the bouquet of nesting females simply by age as an ontogenetic process in both Osmia species. This autonomous change in the CHC profile coincides with an age-specific decrease of young female's willingness to mate. How the resulting short period of female receptivity without back coupling by storage of sperm and the lack of an antiaphrodisiac fit into the behavioural ecology of the studied mason bee species is discussed.
URI:	https://opendata.uni-halle.de//handle/1981185920/13580 http://dx.doi.org/10.25673/13490
Open-Access:	Open-Access-Publikation
Enthalten in den Sammlungen:	Institut für Biologie

Metadata

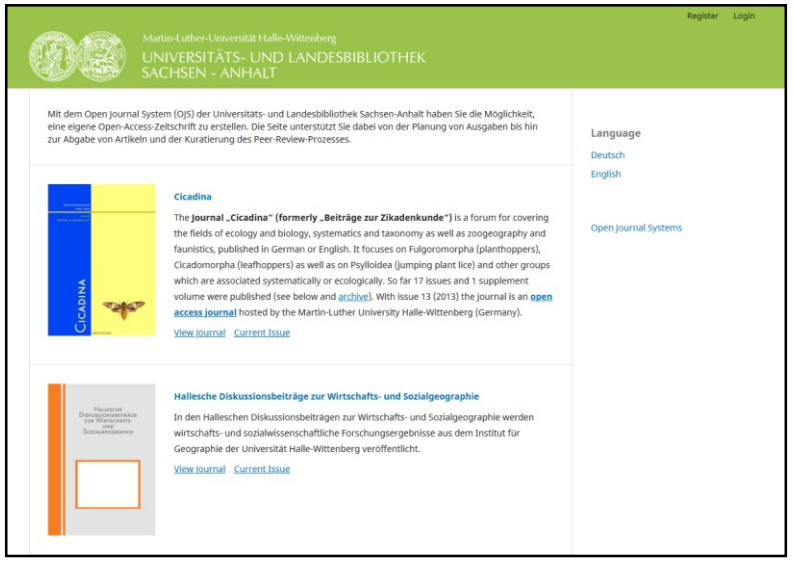
Dateien zu dieser Ressource:

Datei	Beschreibung	Größe	Format	
Osmia-bicornis_Age.txt		55.65 kB	Text	Öffnen/Anzeigen
Osmia-bicornis_AreaPercent.txt		24.88 kB	Text	Öffnen/Anzeigen
Osmia-bicornis_Body-Parts.txt		8.45 kB	Text	Öffnen/Anzeigen

Data

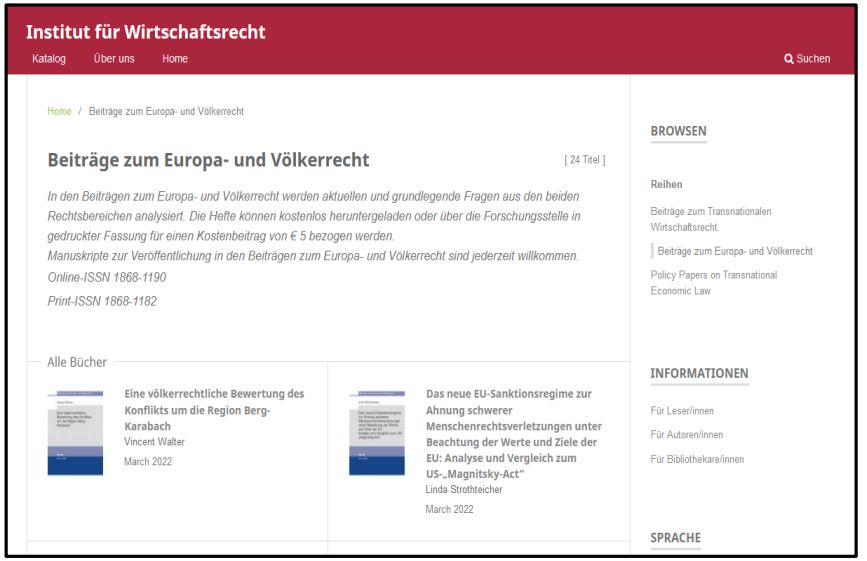
Infrastructural tools for supporting diverse publication workflows

Open Journal System (OJS)

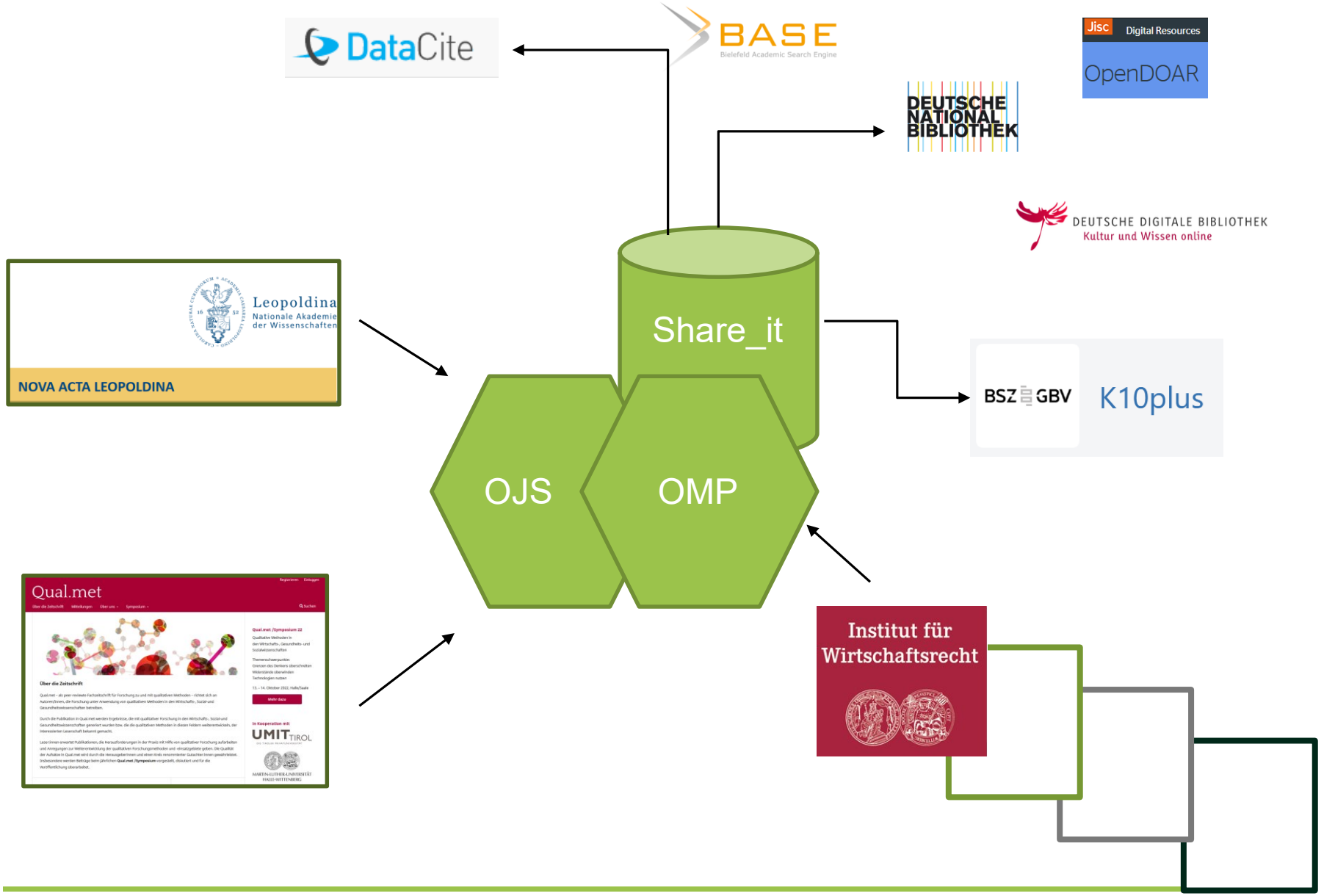


https://public.bibliothek.uni-halle.de/

Open Monograph Press (OMP)



https://omp.bibliothek.uni-halle.de/


DataCite
BASE
Bielefeld Academic Search Engine
Jisc
Digital Resources
OpenDOAR
DEUTSCHE NATIONAL BIBLIOTHEK
DEUTSCHE DIGITALE BIBLIOTHEK
Kultur und Wissen online
Leopoldina
Nationale Akademie der Wissenschaften
NOVA ACTA LEOPOLDINA
Share_it
OJS
OMP
BSZ GBV
K10plus
Qual.met
Über die Zeitschrift
UMIT TIROL
Institut für Wirtschaftsrecht

A primer on research data management RDM

Research data management – basic principles and importance

- RDM-Definition
- RDM- Examples and data creation processes
- Importance
- Requirements of funding bodies (German landscape)
- Current challenges

Research data management in practice

- FAIRing your data
- Research data management plans
- Data structuring
- Data formats

What is open data?

- Open data refers to data that anyone can **access**, **use** and **share**.

- Open data becomes usable if it is made available in ways and **formats** in which people can benefit from it

- Open data becomes usable if people know what they can do with it, therefore open data must be **licensed.**

What are the key concepts when it comes to Open Data?

- Two key concepts for understanding Open Data are **interoperability** and **reproducibility**.

- **Interoperability** is important to ensure different components can work together to build larger and complex systems. Without interoperable datasets and systems there is no point in openess.

- Open Data in an scientific context aims at **making research results** and processes **available** to the public in a way that these are **interoperable** and ready to be **reused**.

- Similarly, to be open in a meaningful way and in order to achieve real openess of your research data, your scientific results need to be **reproducible**. This in turn will make your science **transparent**.

Question:

1. What is your level of expertise with RDM?

RDM Definition – What are research data?

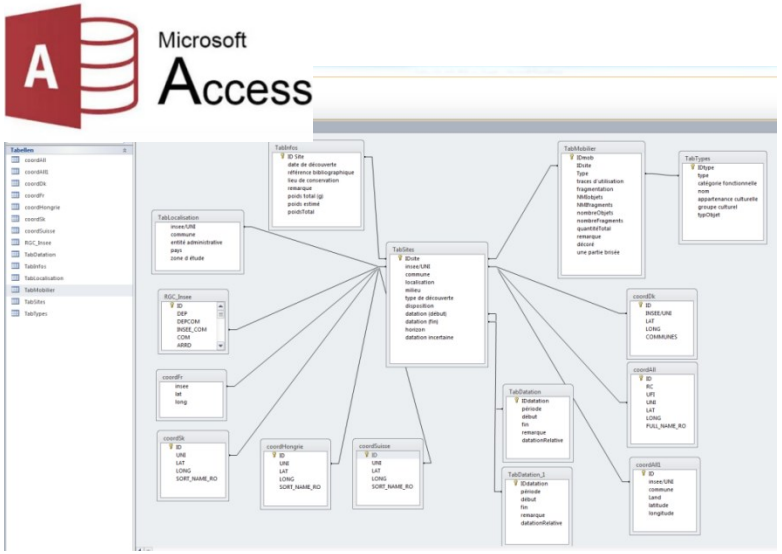
*"…Research data are the original sources or material that you have created or collated to conduct your research project. They can be **digital or non-digital**. The response to your research question is based on the analysis of these research data…"*

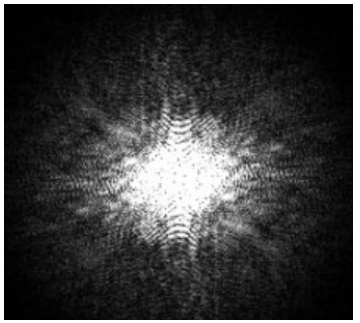
*"…In short data means whatever is necessary to **validate** or **reproduce** your research findings, or to gain a richer understanding of them…."*

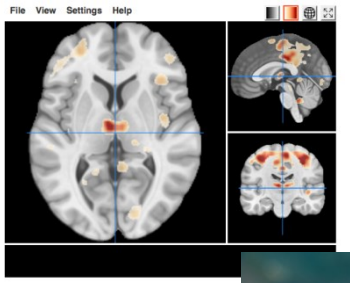
Sources:

- https://www.ed.ac.uk/information-services/research-support/research-data-service/research-data-management
- https://blogs.ucl.ac.uk/rdm/2015/09/what-is-research-data/
- **<last visited on 24.09.2021 >**

Examples


Microsoft
Access

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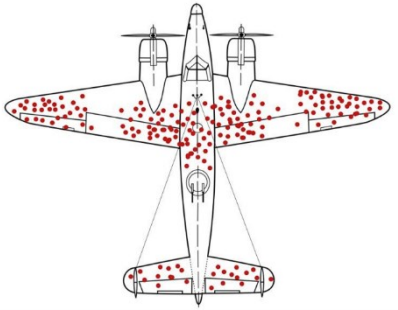
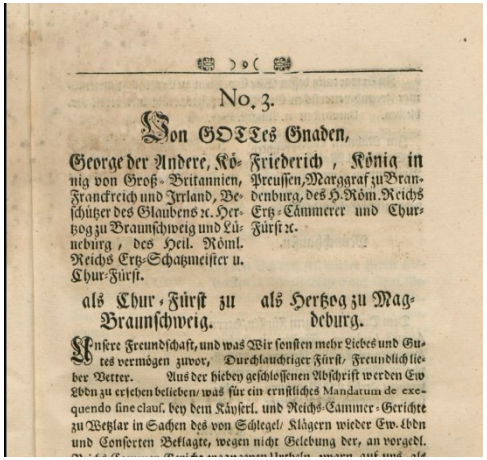
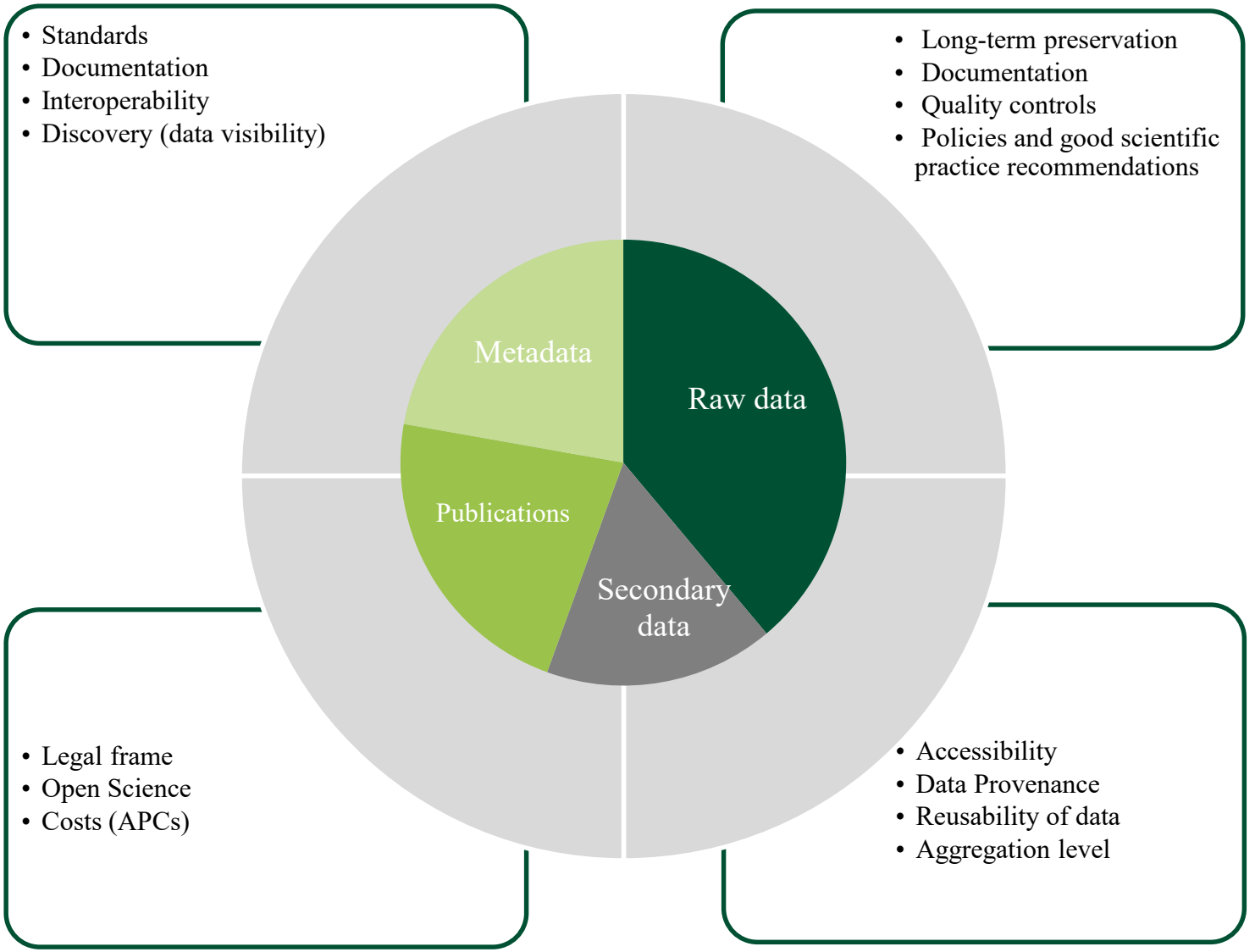



Massive Unterschiede in der Integrität
!
Codesystem
Teufelspakt
Teufelsbuhlschaft
Hexensabbat
Hexenflug
Schadenszauber
Wetterzauber
Personenschaden
Tierschaden
Besitzschaden
Pflanzenschaden
Kindsmord
Zaubermittel
Zauberei erlenen
SUMME
Erklärung
Die Überschneidungsanalyse zeigt auf, welche Kategorien gemeinsam auftreten. Spalten und Zeilen bilden die Kategorien ab, die Zellen zeigen die Häufigkeit der Überschneidung.
Schlussfolgerung
Das eklatante Fehlen von Überschneidungen in Rostock bestätigt sich in der qualitativen Arbeit am Material. Vor allem der Hexensabbat und -flug treten als isoliertes Element auf, das keine inhaltlichen Bezüge zu anderen Textstellen aufweißt. Hier scheinen konkurrierende Hexereivorstellungen in den Dokumenten aufeinander zu treffen, die nur unvollständig vermischt sind.
Strukturanalyse
Strukturelle Ähnlichkeiten
!
Erklärung
Die Strukturanalyse zeigt in welcher Abfolge die Kategorien in den Einzeltexten auftreten. Die Zeilen sind die Einzeldokumente, die Spalten die nummerierten Absätze. Die Zellen wurden in den Farben der Kategorien gefüllt. (Teufelspakt-rot, Buhlschaft-braun, Sabbat-blau, Flug-violett, Schadenszauber-schwarz)
Schlussfolgerung
In Hainburg tritt eine klare Textstruktur zutage. In Rostock folgen die Texte einer ähnlichen Tendenz (rot, blau/violett, schwarz) jedoch ist die Struktur weniger eindeutig und zahlreiche Lücken treten auf, die von den fünf Hauptkategorien nicht erfasst werden.
13. Berliner Methodentreffen Qualitative Forschung, 21.-22. Juli 2017 - Andreas Müller (MA-Student), Universität Wien - andreas.w.mueller@outlook.com


No. 3.
Von GOTTes Gnaden,
George der Andere, König in Friederich, König in
als Chur-Fürst zu Braunschweig.
als Hertzog zu Magdeburg.

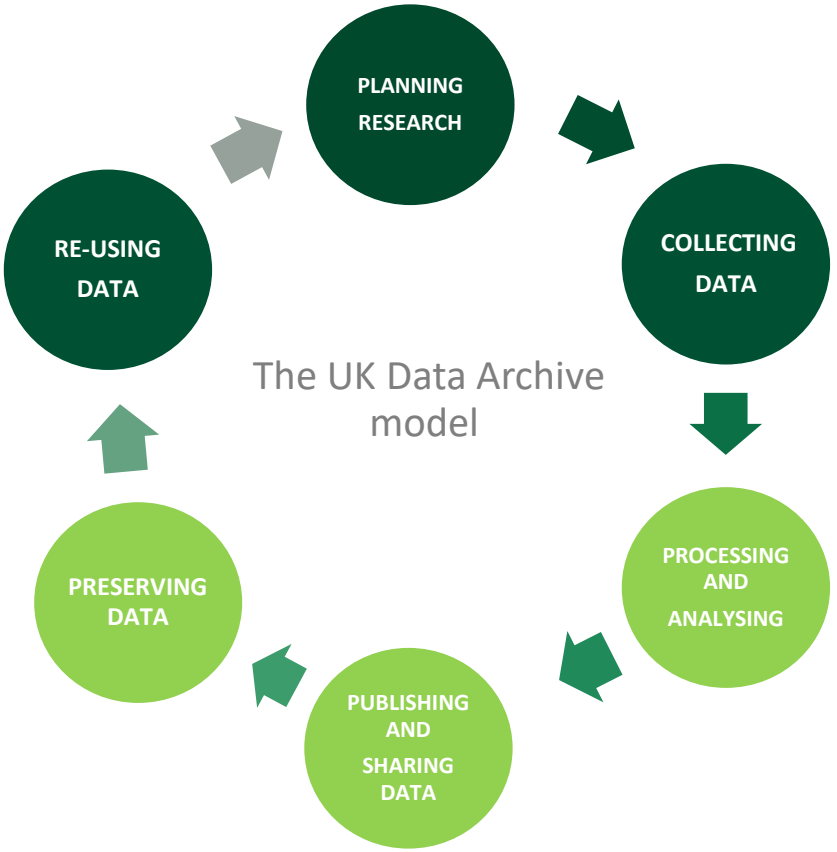

Die fluge Mama als Detektiv.

RDM Definition – What are research data?



Models

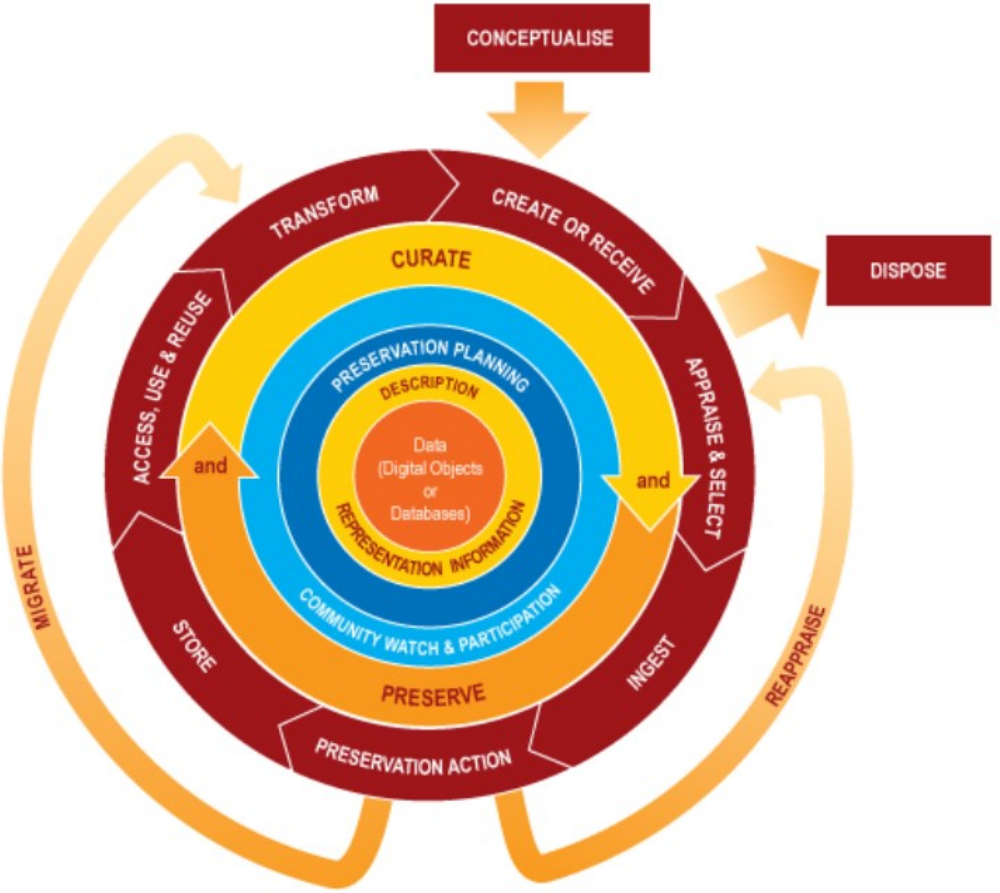
Research data life cycle model



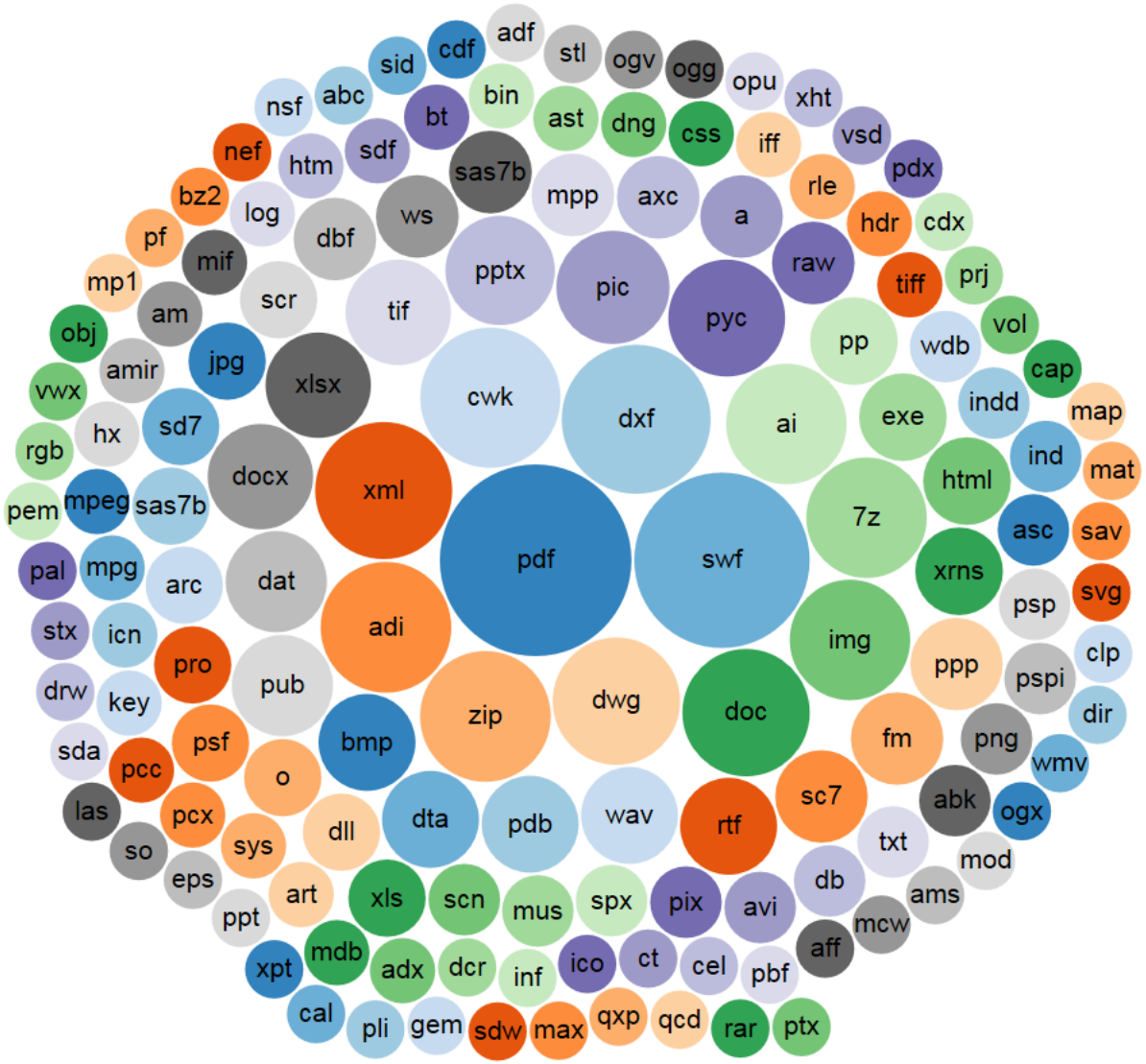
Source. https://www.researchgate.net/figure/Data-life-cycle-model-UK-Data-Archive_fig1_333466327

Models

The Curation Lifecycle Model (Digital Curation Centre)



Source: http://www.dcc.ac.uk/resources/curation-lifecycle-model


adf
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sas7b
mpp
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pptx
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pyc
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vol
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amir
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cwk
dxf
ai
exe
indd
cap
vwx
hx
sd7
map
rgb
docx
xml
html
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mat
pem
mpeg
sas7b
pdf
swf
7z
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drw
key
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sda
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wmv
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mod
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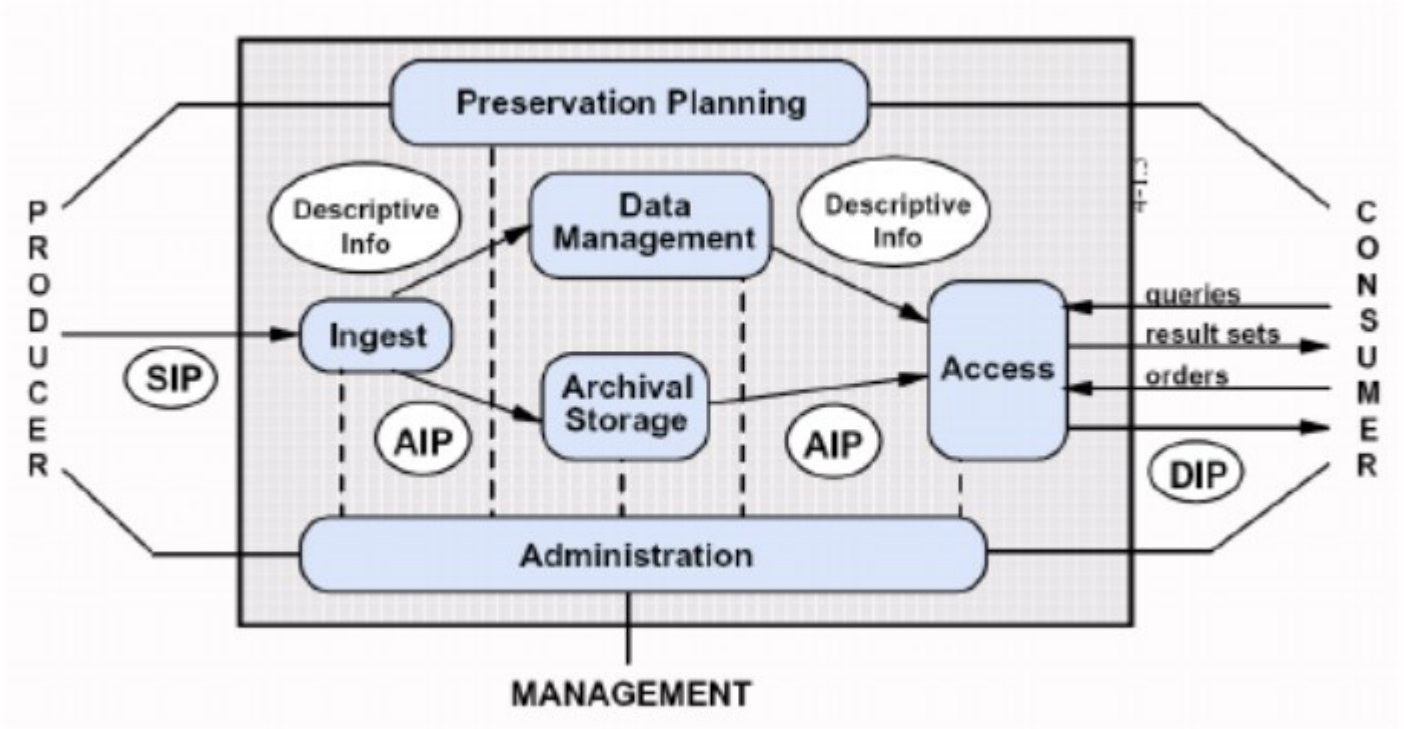


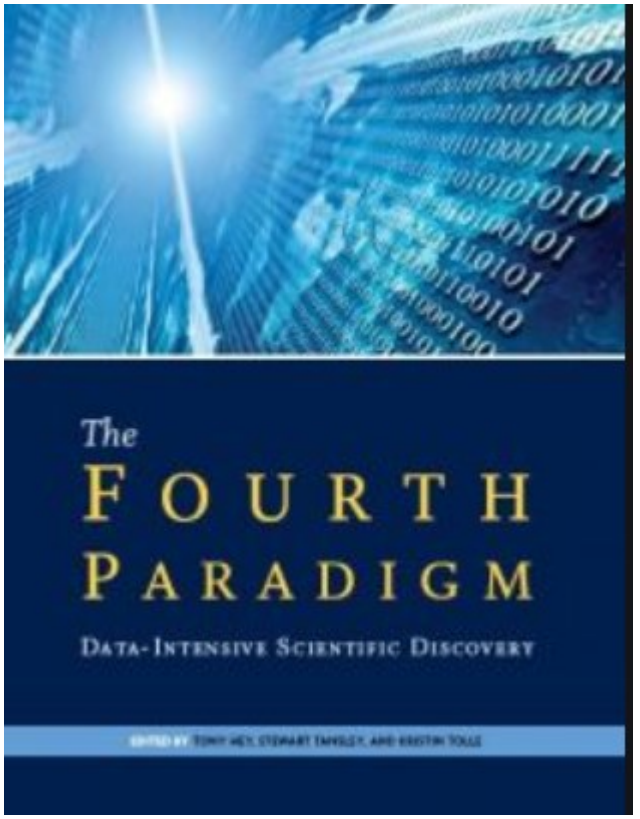
The Open Archival Information System: ISO-Standard 14721:2012

Why is RDM important?

- Rapid growth of research data
- Research data are complex: subject-specific expertise are needed to manage them efficiently
- Funders are increasingly demanding a better management and accountability whilst working with research data (DPMs, technical reviewers)
- Research data are important publicly-funded resources whose permanency and availability should be secured

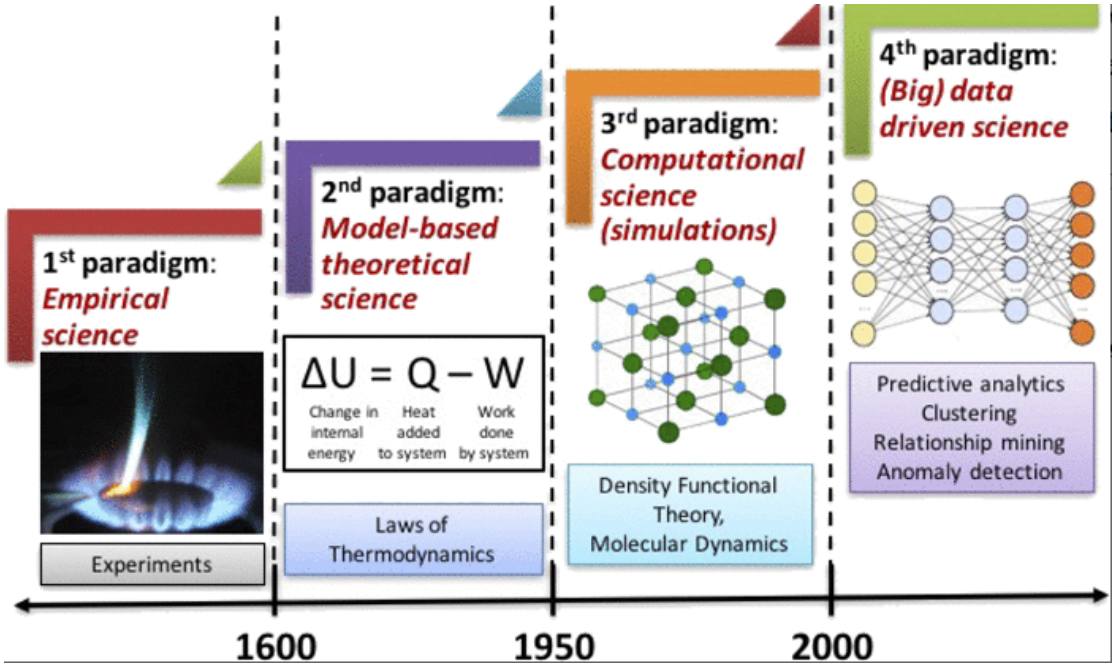
Question:

2. Have you used supplementary materials?

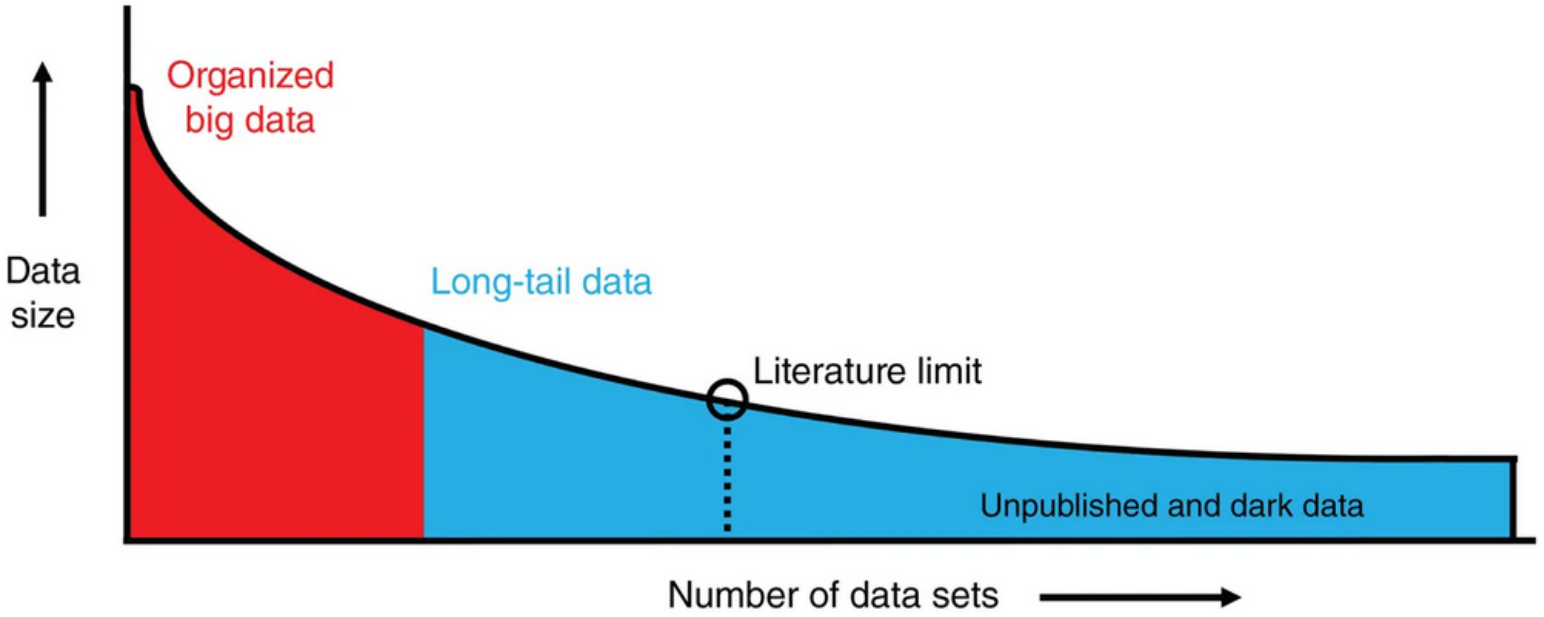


Datasets continue to grow in size and complexity and are increasingly the focus of science today!

Tony Hey
Stewart Tansley
Kristin Tolle
Microsoft Research | October 2009
ISBN: 978-0-9825442-0-4

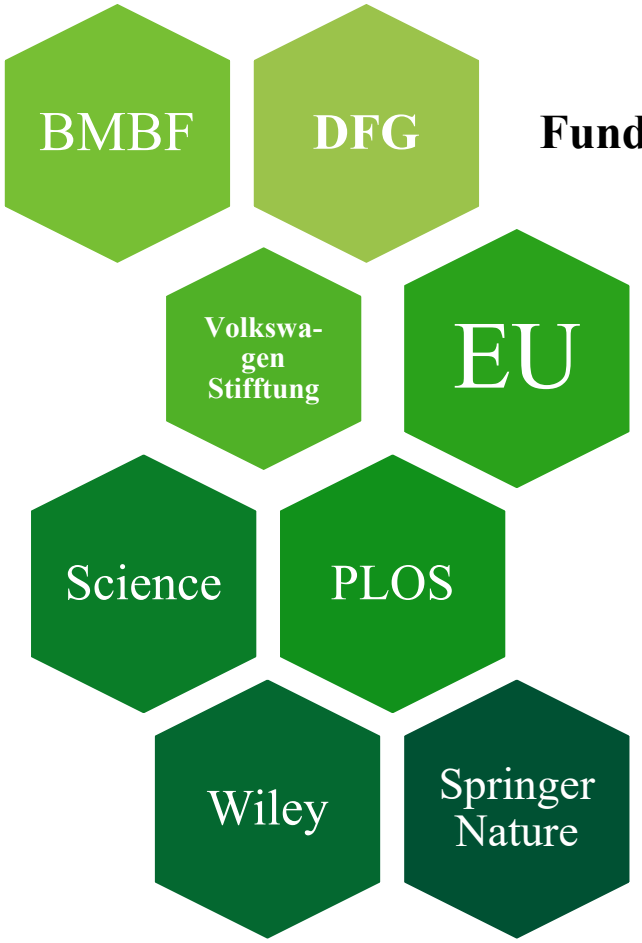


Source: https://aip.scitation.org/doi/10.1063/1.4946894

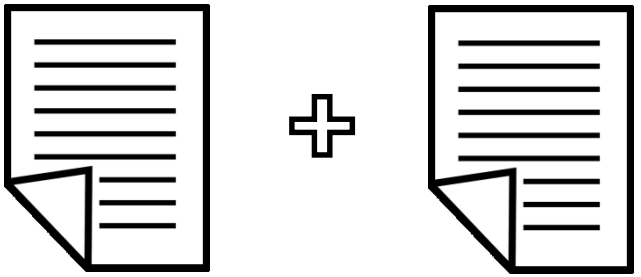


Source: http://www.nature.com/neuro/journal/v17/n11/fig_tab/nn.3838_F1.html

Requirements of funding bodies (German landscape)



Funding bodies



Grant application

DMPs

Publishers

Research data archives / repositories

After: Was sind Forschungsdaten? - https://doi.org/10.18450/dataman/90

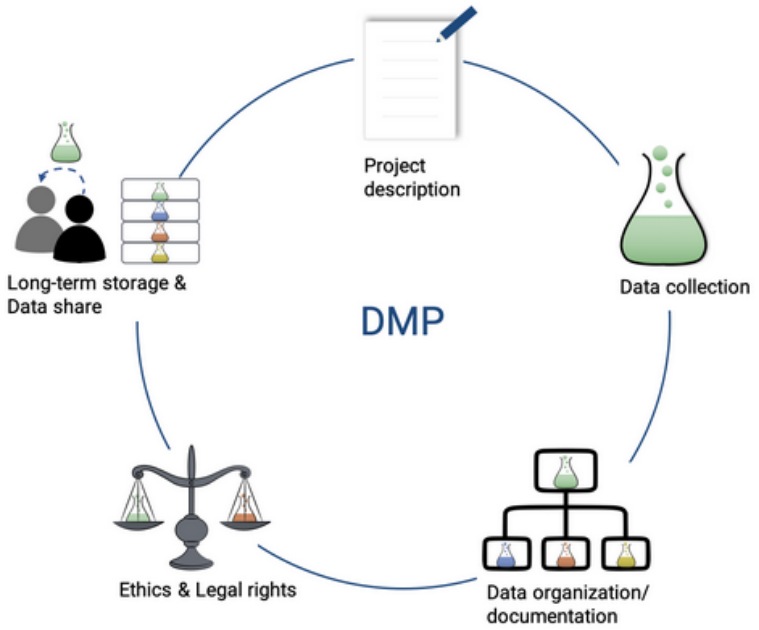
Question:

3. Do you know what a research data management plan is?

Data management plans (DMPs)

A data management plan (DMP) is a document describing the life cycle of data (especially research data) from collection to archiving, including all actions and processes that ensure that the data remains available, usable and comprehensible.

DMPs will vary across disciplines with some DMPs being more complex than others but there are some elements which will remain the same for all fields. Below an illustration from the logs-repository listing these basic elements:



Source: https://logs-repository.com/articles/essentials-for-a-data-management-plan-for-spectroscopists/

Important aspects to consider when writing a DMP

- **Project description**
  - □ Specify the roles and responsibilities for your project
  - □ Ensure you know the status of existing data (are there any legal or data protection or intellectual property rights issues?)
  - □ Think about the future usage of your dataset

- **Description of the data development methods is available**
  - □ Describe your data (numeric, observational, simulation, textual, etc.) and formats
  - □ The amount (GB, TB, PB) and complexity (proprietary, BigData, Long-tailed) of data set is known
  - □ Your data generation, quality assurance and analysis processes are defined

- **Standards and Metadata**
  - □ Pay attention to standards for documenting and creating metadata. These will ensure an adequate distribution, provision and interchangeability of your data
  - □ Metadata should be machine readable and following community standards (METS, MODS, DC, TEI)
  - □ The generation and human and machine readable documentation is important

- **Archiving and storage**
  - □ Where is your project data going to live after the completion of your project
  - □ Allocate a persisten identifier to your research data so that these can be found
  - □ Have long-term preservation solutions been considered?
  - □ Can the data be accessible and findable after depositing/archiving?

The FAIR Data Principles for scientific data

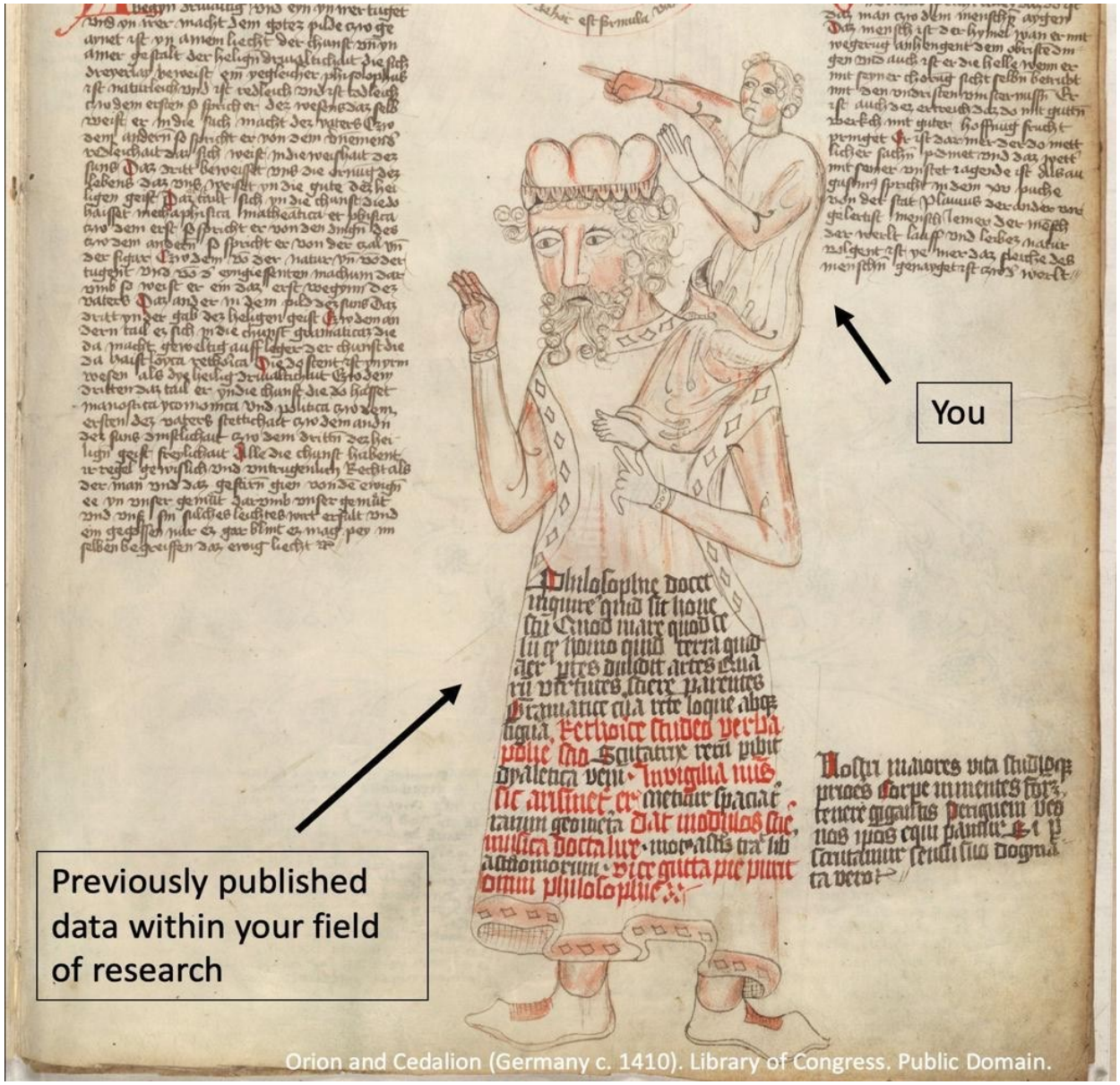
Findable
F1. (meta)data are assigned a globally unique and persistent identifier
F2. data are described with rich metadata
F3. metadata clearly and explicitly include the identifier of the data it describes
F4. (meta)data are registered or indexed in a searchable resource

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

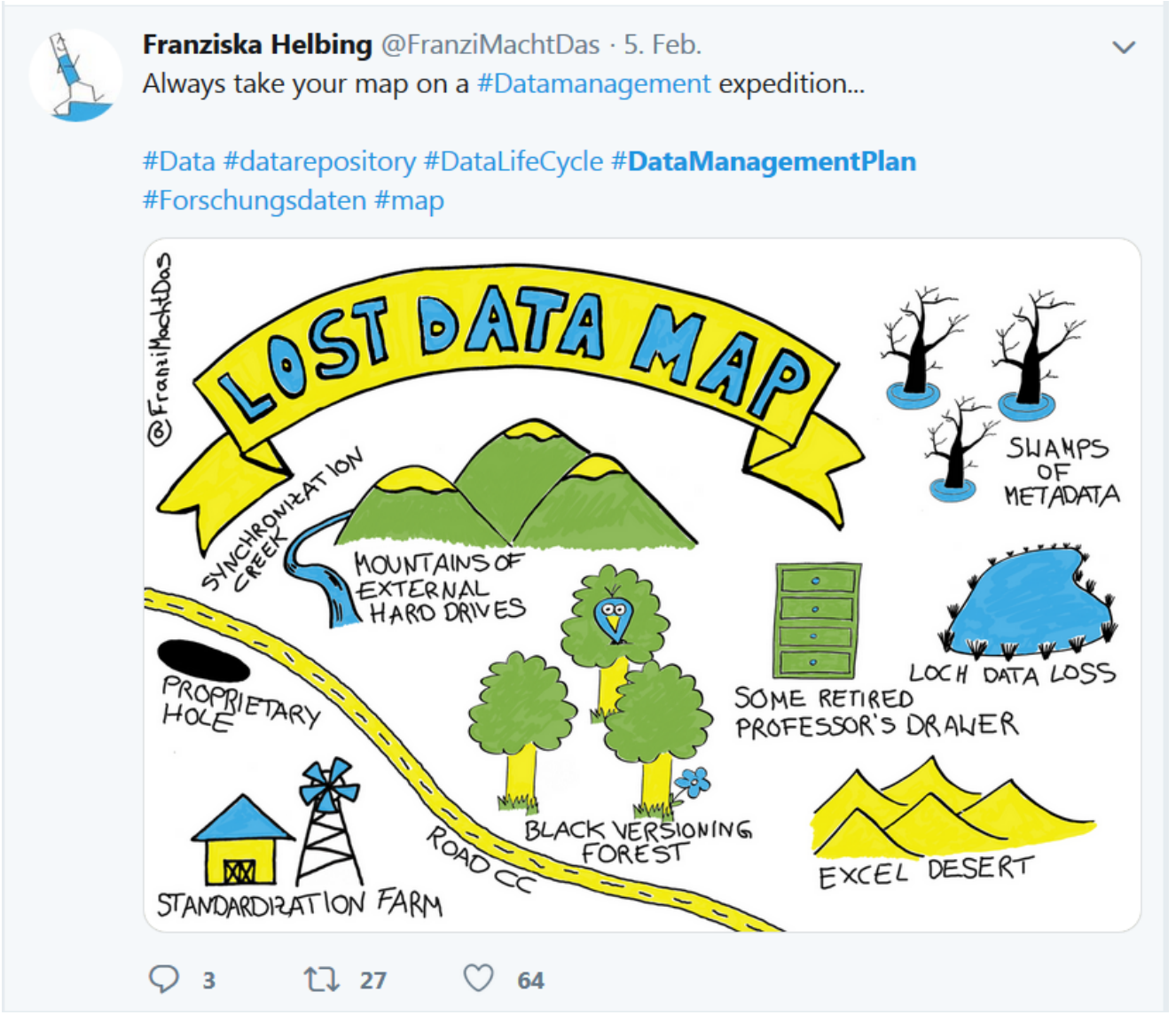
Interoperable
I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
I2. (meta)data use vocabularies that follow FAIR principles
I3. (meta)data include qualified references to other (meta)data

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

Source: Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3, 160018 (2016). https://doi.org/10.1038/sdata.2016.18

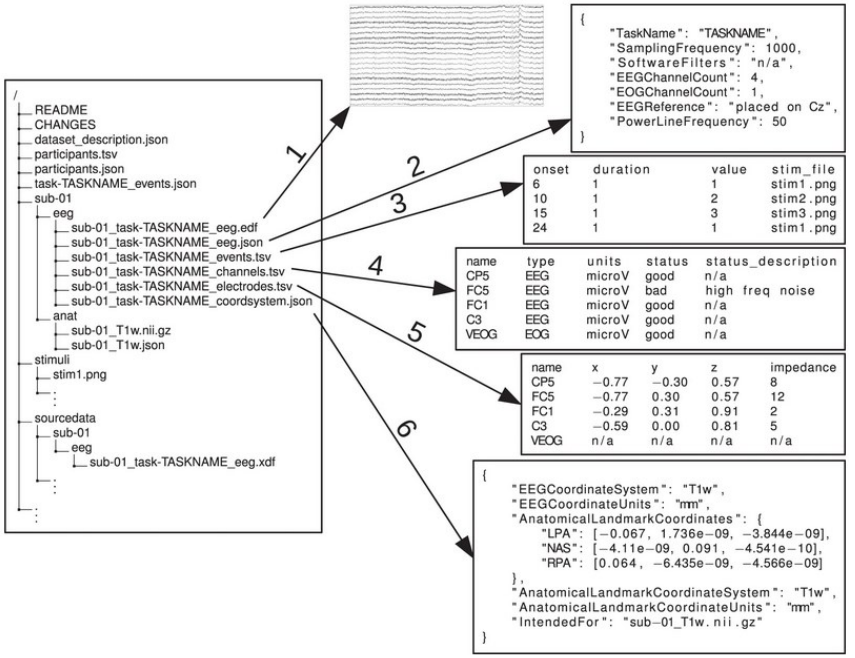


Orion and Cedalion (Germany c. 1410). Library of Congress. Public Domain.


Franziska Helbing @FranziMachtDas · 5. Feb.
Always take your map on a #Datamanagement expedition...
#Data #datarepository #DataLifeCycle #DataManagementPlan
#Forschungsdaten #map
@FranziMachtDas
LOST DATA MAP
SYNCHRONIZATION CREEK
MOUNTAINS OF EXTERNAL HARD DRIVES
SWAMPS OF METADATA
LOCH DATA LOSS
SOME RETIRED PROFESSOR'S DRAWER
PROPRIETARY HOLE
BLACK VERSIONING FOREST
EXCEL DESERT
ROAD CC
STANDARDIZATION FARM
3
27
64

Apart from writing DPMs, how can you start practicing RDM?

- **Use a logical structure for your data directories**
  - A base or root directory with name XXXX and a series of sub-directories such as ‘events’, ‘data’, ‘ projects’, etc. are a good start.
  - Urls of archives and newspapers are good examples of how to structure content
  - Avoid using spaces and special characters when naming your paths and files

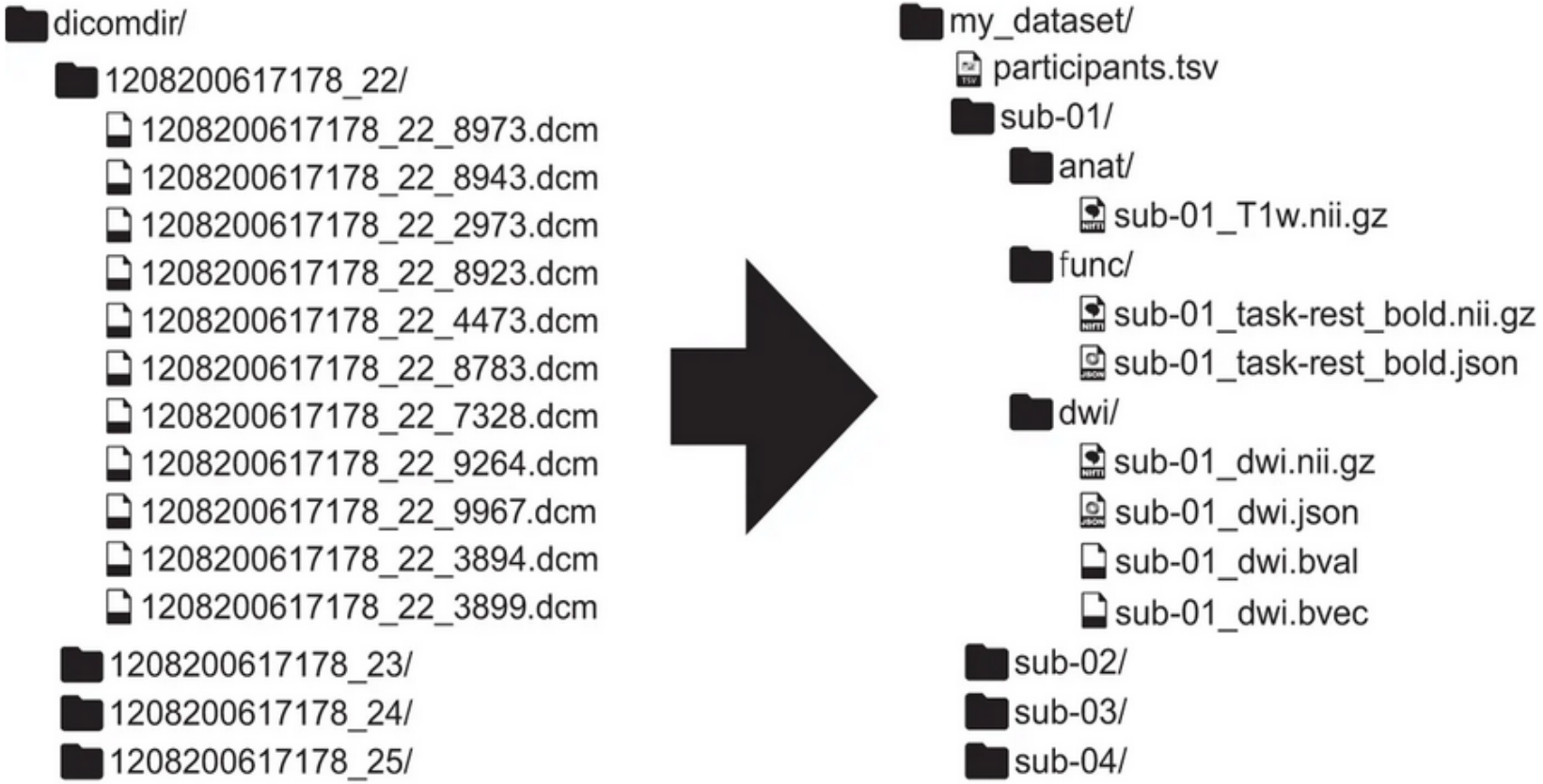


- **Use plain text formats and characters**
  - Use CSV , TXT, JSON files because these are machine readable and platform independent
  - When working with files for automation or computational processing, leave out formatting and focus on the efficient transmission of all meaningful information

Source: https://www.nature.com/articles/s41597-019-0104-8

Apart from DPMs, how can you start practicing RDM?

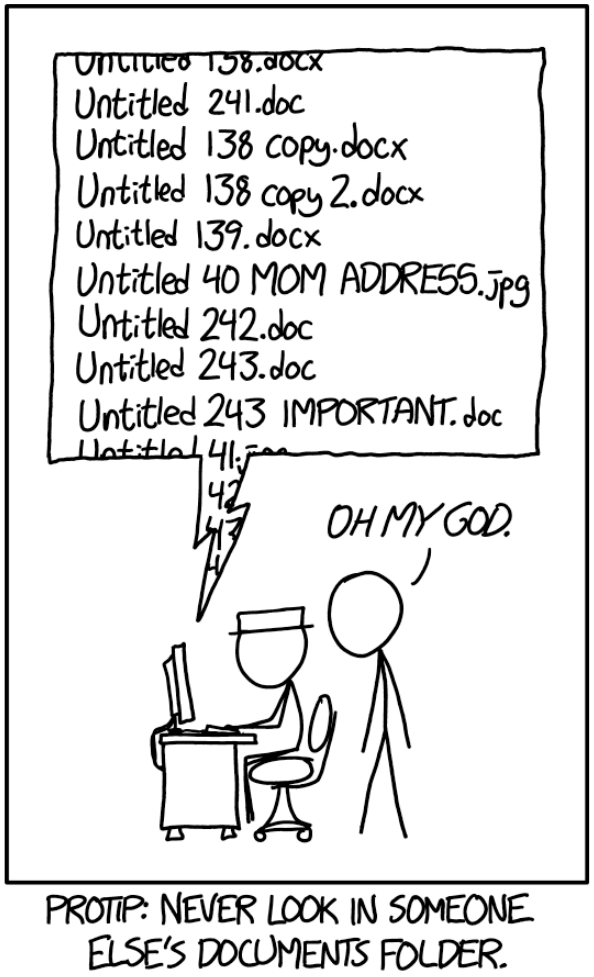
From: The brain imaging data structure, a format for organizing and describing outputs of neuroimaging experiments



BIDS is a format for standardizing and describing outputs of neuroimaging experiments (left) in a way that is intuitive to understand and easy to use with existing analysis tools (right).

Source: https://www.nature.com/articles/s41597-019-0104-8

Data structuring

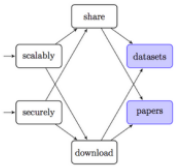


Source: https://xkcd.com/1459/ under a CC-BY NC License - http://20px.com/blog/2015/07/16/catalogue-bad-file-naming/

Other publishing platforms and services

OXFORD ACADEMIC

(GIGA)n SCIENCE



Academic Torrents

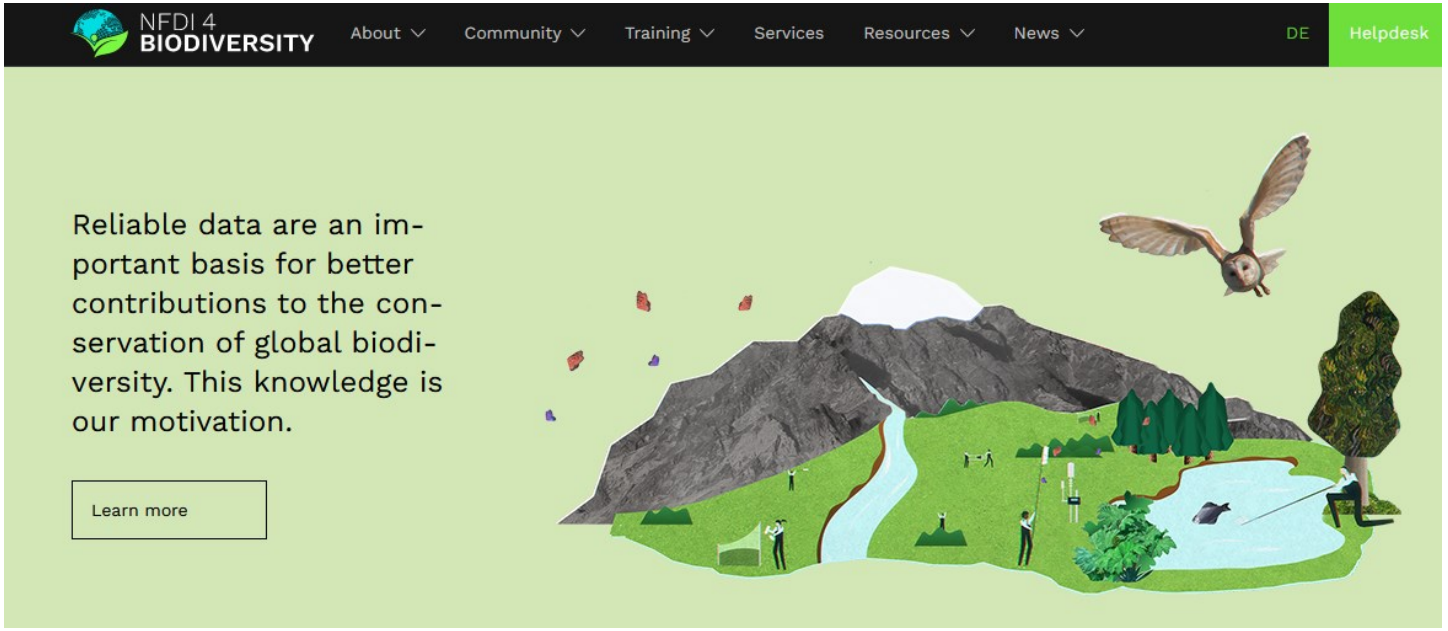
Online directories to find data repositories and further information

re3data.org

REGISTRY OF RESEARCH DATA REPOSITORIES

Search... Search

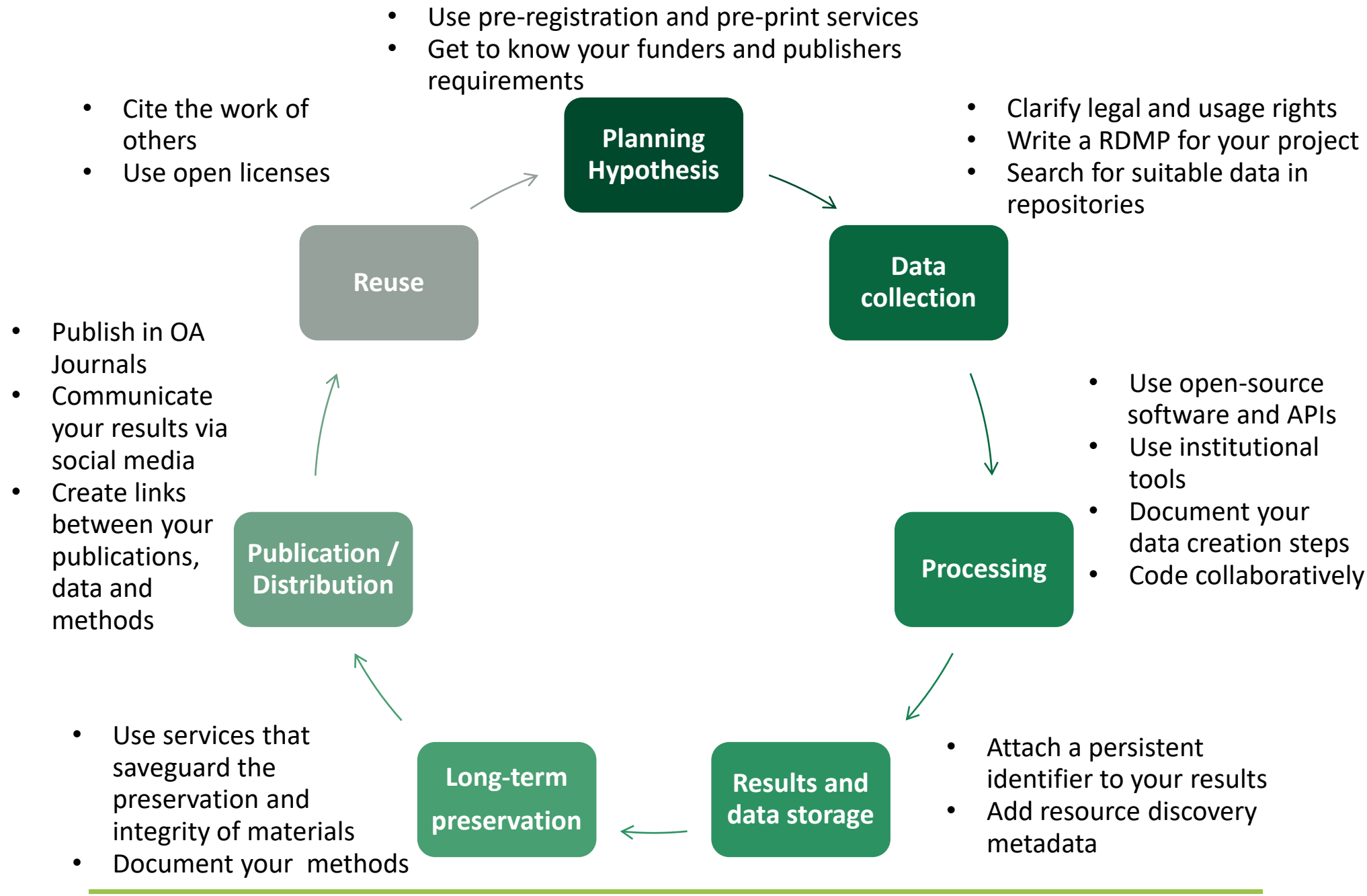
dini



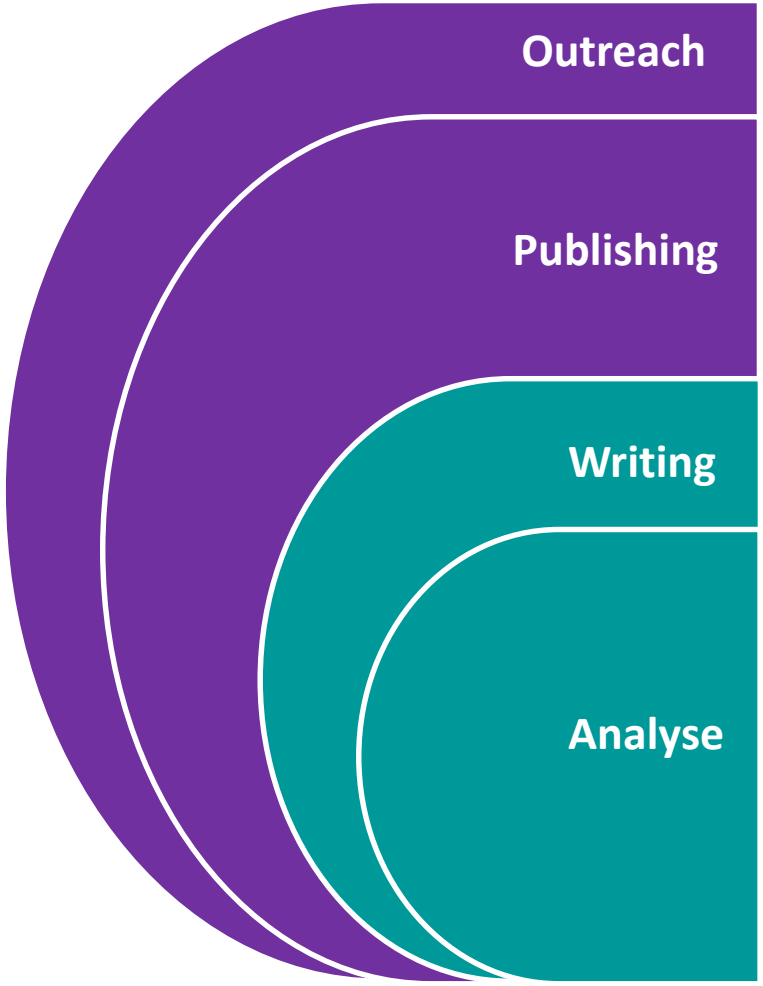
https://www.nfdi4biodiversity.org/de/training/lehr-und-lernmaterialien/

Github Repositories:

- Jupypter Unveiled: https://github.com/sojwolf/Jupyter_Workshop_Winterschool_2022
- Data Scientist for Ecologist: https://github.com/DataScience4EcologistsR/TidyData


Use pre-registration and pre-print services
Get to know your funders and publishers requirements
Planning Hypothesis
Clarify legal and usage rights
Write a RDMP for your project
Search for suitable data in repositories
Data collection
Use open-source software and APIs
Use institutional tools
Document your data creation steps
Code collaboratively
Processing
Attach a persistent identifier to your results
Add resource discovery metadata
Results and data storage
Use services that saveguard the preservation and integrity of materials
Document your methods
Long-term preservation
Publish in OA Journals
Communicate your results via social media
Create links between your publications, data and methods
Publication / Distribution
Cite the work of others
Use open licenses
Reuse

Other important tools available to you



- Communicate your science via Social-Media channels
- Share posters/presentations via in OA-Repos
- Publish in Open Access "Gold" or "Green" journals
- Use preprint servers
- Use open licenses like CC0/CC-BY
- Consider publishing data descriptors und datasets
- Use XML-based programmes like Overleaf – Authorea
- Use collaborative tools like Sciflow
- Share your protocols and workflows if possible
- Manage your code and scripts
- Safe and share your software via repositories
- Preregister your studies
- Share your data sets via suitable Repositories

Adapted from: Bianca Krammer & Jeroen Bosman

DOI 10.5281/zenodo.1147025