

RDM AND RESEARCH FUNDERS: AN UPDATE

THE ROLE OF DATA MANAGEMENT PLANS IN PROJECT PROPOSALS

OPEN SCIENCE WEEK 2022 | INES SCHMAHL

RDM AND RESEARCH FUNDERS: AN UPDATE

Introduction

Aim:
**Reusable and accessible research data for the
scientific community**

Motivation of research funders for research data management

- eases the validation of research results
- commit to and promote open science
- reusing data avoids multiple financing
- enables new research by combining different data sources

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Introduction

How can we get reusable data?



- Crucial is the early integration of research data management into the project planning.

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Introduction

Method: Data Management Plan (DMP)

All data management measures are noted in the dmp.

- This creates clear and consistent guidelines for project staff.
- It prevents missing requirements from research funders, etc.
- Guarantees that the data is reusable for others.



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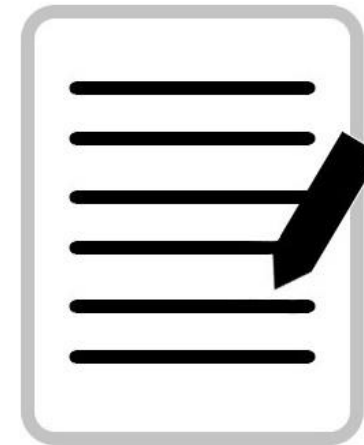
Data management plan (DMP)

Common structure:

1. General information
2. Data and methods
3. Store data
4. Archive data
5. Share and publish data
6. Resources and responsibilities

**Document for
structuring and describing
data management**

DMP



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Data management plan (DMP) – General information

General information



- Project name
- Researcher(s)
- Project partner(s)
- Project data contact
- Description

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Data management plan (DMP) – Data and methods

Data description



- Data type
- Data file format
- Data volume
- Methods of creation and analysing

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Data management plan (DMP) – Data and methods

Data organisation



- File names
- Folder structure

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Data management plan (DMP) – Data and methods

Data documentation



- Describe how the research process will be documented?
- Which Metadata (schema) will be collected?
- Are there subject- or project-specific standards for documenting?

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Data management plan (DMP) – Data and methods

Quality assurance

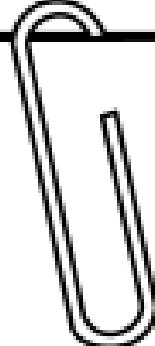


- What quality assurance measures will be used?
- For example: instrument calibrations or peer review of the data

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Data management plan (DMP) – Store data

Data storage

- 
- Storage location
 - Expected data volume
 - Backup strategy

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Data management plan (DMP) – Archive data

Data archiving



- Criteria for data selecting
- Where will the data be archived?
- Requirements of the archive

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Data management plan (DMP) – Share data

Data sharing



- Clarify legal issues before sharing data.
- To whom will the data be shared and
- under which conditions?

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Data management plan (DMP) – Publish data

Data publishing

- 
- Clarify legal issues before publication.
 - Where will the data be published and
 - under which conditions?

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Data management plan (DMP) – Resources and responsibilities

Resources, costs and responsibilities

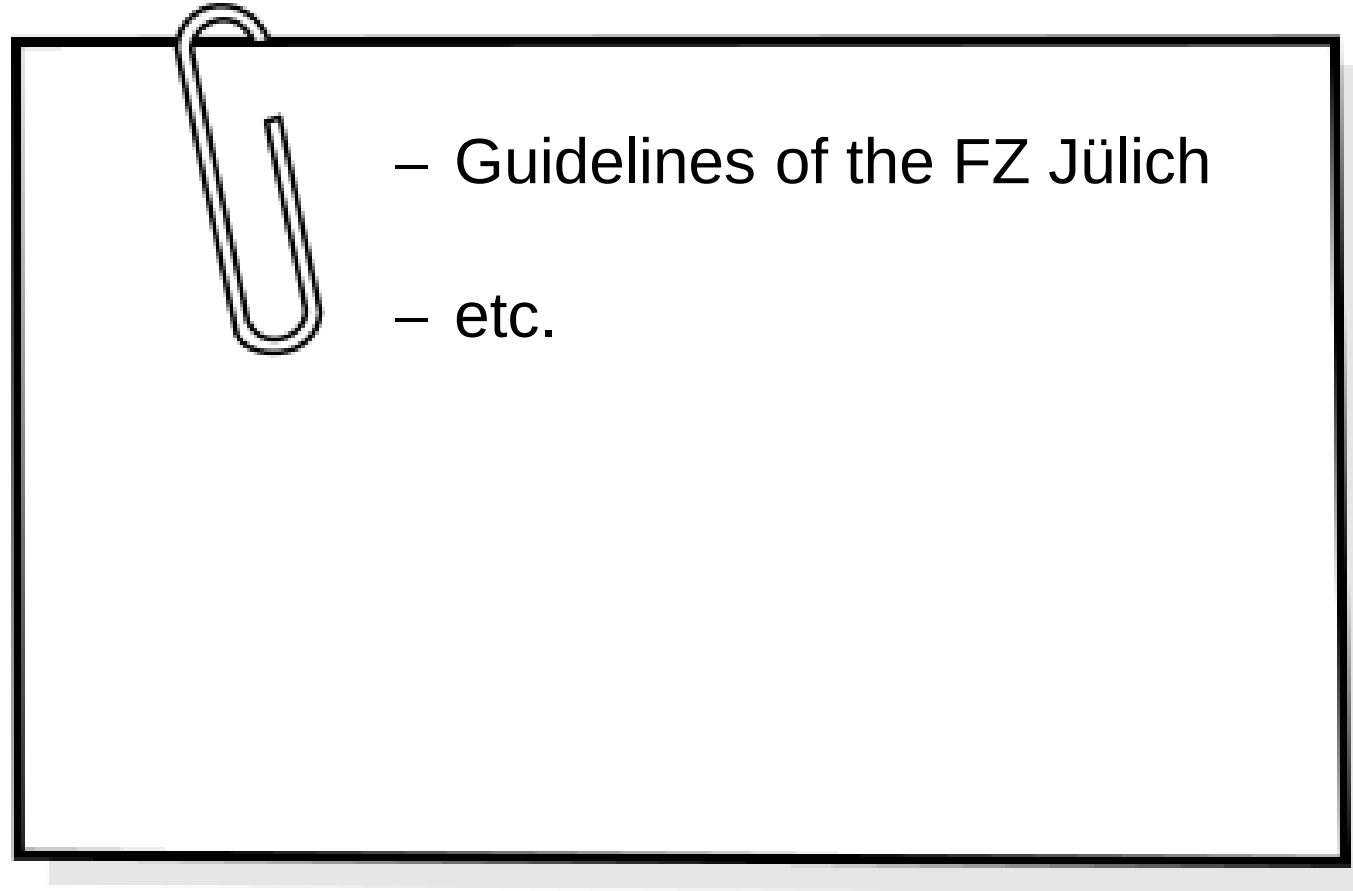


- Costs
- Needed infrastructure
- Who is responsible?

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Data management plan (DMP) – Resources and responsibilities

Further issues like data security, legal aspects, guidelines



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Data management plan (DMP) – Summary

A DMP should give an overview about the data management.

Each project is different.



A DMP can be customized.

At the start of a project
not all issues are clarified.



A DMP does not have to be complete.
It can be versioned during the project.

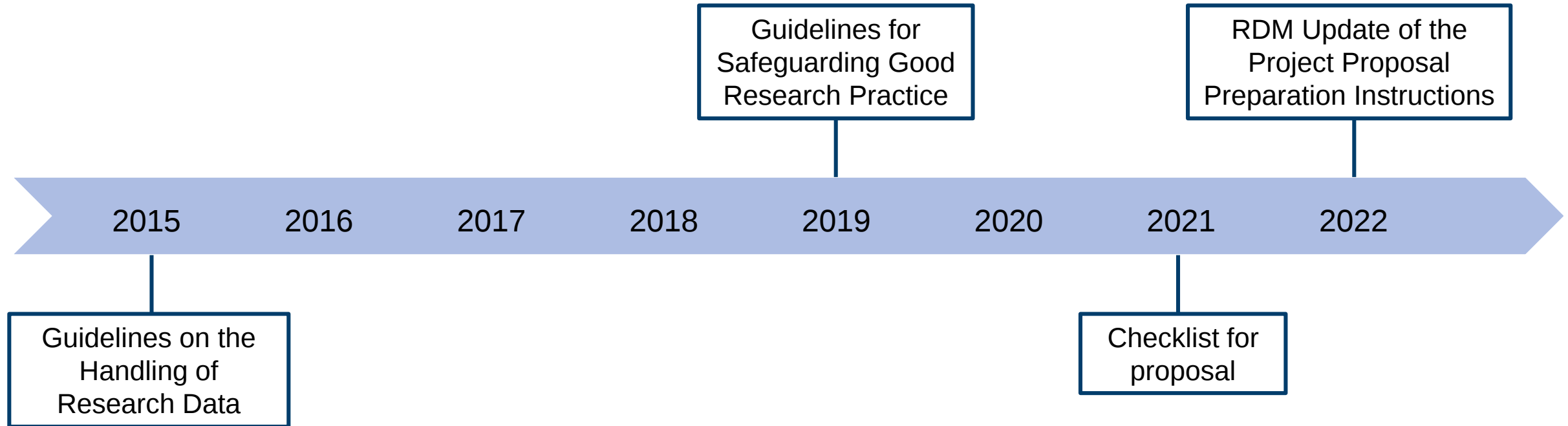
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Research funders



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DFG – Timeline



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DFG – Guidelines on the Handling of Research Data

Details about research data management in proposal

- Which data will be generated or evaluated?
- Include discipline-specific standards
- Where will the data be archived (suitable repository, if available)?
- data publication planning
- Information on third-party rights

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DFG – Guidelines for Safeguarding Research Practice

New guidelines for research data management

Guideline 7: Cross-phase quality assurance

- Researchers carry out each step of the research process *lege artis*. When research findings are made publicly available (in the narrower sense of publication, but also in a broader sense through other communication channels), the quality assurance mechanisms used are always explained. This applies especially when new methods are developed.

- Give information about origin of data, materials, etc.
- Describe nature and scope of research data
- Handle research data in accordance with subject-specific standards

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DFG – Guidelines for Safeguarding Research Practice

Guideline 13: Providing public access to research results

► As a rule, researchers make all results available as part of scientific/academic discourse. In specific cases, however, there may be reasons not to make results publicly available (in the narrower sense of publication, but also in a broader sense through other communication channels); this decision must not depend on third parties. Researchers decide autonomously – with due regard for the conventions of the relevant subject area – whether, how and where to disseminate their results. If it has been decided to make results available in the public domain, researchers describe them clearly and in full. Where possible and reasonable, this includes making the research data, materials and information on which the results are based, as well as the methods and software used, available and fully explaining the work processes. Software programmed by researchers themselves is made publicly available along with the source code. Researchers provide full and correct information about their own preliminary work and that of others.

- Make research data, materials, etc. available in archives and repositories
- Implement FAIR principles (findable, accessible, interoperable, reusable)

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DFG – Checklist for proposal

- DFG developed a checklist in 2021.
- Checklist should be an orientation for researchers.
- It includes 6 points in research data management with explanations.

Checklist Regarding the Handling of Research Data

1. Data description

How does your project generate new data? Is existing data reused? Which data types (in terms of data formats like image data, text data or measurement data) arise in your project and in what way are they further processed? To what extent do these arise or what is the anticipated data volume?

2. Documentation and data quality

What approaches are being taken to describe the data in a comprehensible manner (such as the use of available metadata, documentation standards or ontologies)? What measures are being adopted to ensure high data quality? Are quality controls in place and if so, how do they operate? Which digital methods and tools (e.g. software) are required to use the data?

3. Storage and technical archiving the project

How is the data to be stored and archived throughout the project duration? What is in place to secure sensitive data throughout the project duration (access and usage rights)?

4. Legal obligations and conditions

What are the legal specifics associated with the handling of research data in your project? Do you anticipate any implications or restrictions regarding subsequent publication or accessibility? What is in place to consider aspects of use and copyright law as well as ownership issues? Are there any significant research codes or professional standards to be taken into account?

5. Data exchange and long-term data accessibility

Which data sets are especially suitable for use in other contexts? Which criteria are used to select research data to make it available for subsequent use by others? Are you planning to archive your data in a suitable infrastructure? If so, how and where? Are there any retention periods? When is the research data available for use by third parties?

6. Responsibilities and resources

Who is responsible for adequate handling of the research data (description of roles and responsibilities within the project)? Which resources (costs; time or other) are required to implement adequate handling of research data within the project? Who is responsible for curating the data once the project has ended?

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DFG – RDM Update on Project Proposal Preparation Instructions

- Points from the checklist are now included in the Proposal Preparation Instructions
- More detailed description is expected
- Subject-specific appropriate description is expected

2.4 Handling of research data

If your project uses, generates and/or processes data, use this section to record key information on the handling of this data (and any underlying objects). Please ensure your descriptions substantively follow the points in the corresponding questionnaire (www.dfg.de/forschungsdaten/checkliste) and use the checklist to address the following aspects in particular:

- Characteristics and scope of data
- Documentation and data quality
- Storage and technical archiving
- Legal obligations and conditions
- Enabling subsequent reuse and long-term accessibility
- Responsibilities and resources

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DFG – Overview

- No mandatory DMP
- No DMP template
- Details about research data management in proposal are mandatory



DFG Deutsche Forschungsgemeinschaft

Home » Funding » Principles of DFG Funding » Handling of Research Data

Handling of Research Data

One essential component of quality-oriented, compatible research is that the data a research project is based on or generates is handled in a way that is appropriate to the subject-specific discipline. For this reason, the handling of research data and the objects on which the data is based have to be carefully planned, documented and described. Wherever possible it is important to enable subsequent use of the research data and potentially also the objects by other users. Subject-specific recommendations regarding standards, methods and infrastructures should be taken into account.

News

DFG took part in a DINI workshop entitled "Data management plans between funder requirements and research practice" on 18.03.2021

▪ [DINI website \(in German only\)](#)

Checklist for the appropriate handling of research data in connection with DFG projects

This [questionnaire](#) will help you plan and describe the handling of research data in connection with your project.

Tipps on the website [Handling of Research Data](#)

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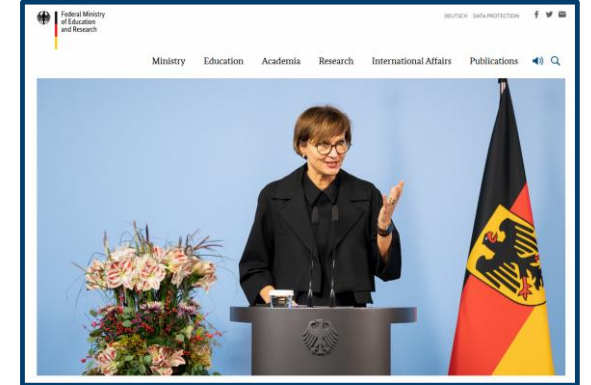
DFG – Comparison

Common dmp structure	RDM in the proposal (DFG)
1. Project description 2. Data and methods 3. Store data 4. Archive data 5. Share and publish data 6. Resources and responsibilities	1. Characteristics and scope of data 2. Documentation and data quality 3. Storage and technical archiving 4. Legal obligations and conditions 5. Enabling subsequent reuse and long-term accessibility 6. Responsibilities and resources (see Proposal Preparation Instructions)

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BMBF – Overview

- Started 2020 the [action plan research data](#) with focus on
 - Data infrastructure and data sovereignty
 - Data-driven innovations
 - Data literacy
- No common requirements in research data management, depends on the funding program
- Utilization plan is required in proposal



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BMBF – Utilization Plan

Utilization plan	Description
• Economic utilization • Scientific-technical utilization • Scientific and economic further developments/projects • Knowledge transfer	• E.g. development of cheaper or more time efficient methods • E.g. improved understanding of complex correlations • Transfer of gained knowledge/research outputs to other areas • Publications (paper, data, software)

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Horizon Europe (EU Framework Program for Research and Innovation for 2021-2027)

New: Open Science Policy

- Open science as standard

Implementing open science practices like:

- Open access to research outputs
- Open peer-review
- Enhance reproducibility of results



Factsheet „A new European Research Area“

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Horizon Europe (EU Framework Program for Research and Innovation for 2021-2027)

Describe in the proposal:

- Which open science practices will be implemented?
- Plan for data management
- Explain expertise in open science
- List of up to 5 (open access) publications, (FAIR) datasets, etc. relevant for project

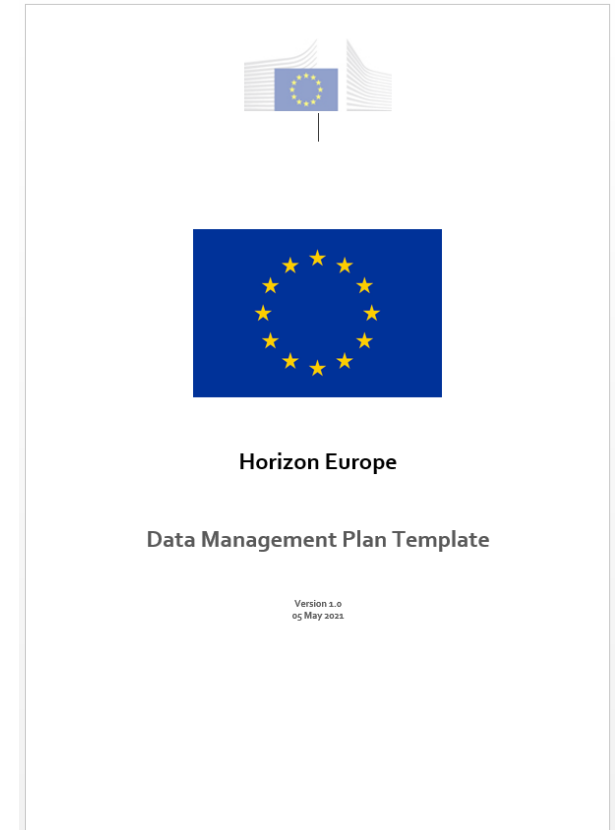


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Horizon Europe (EU Framework Program for Research and Innovation for 2021-2027)

Further requirement:

- DMP is mandatory
- DMP template is provided, recommended but not mandatory
- FAIR principles must be fulfilled



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Horizon Europe (EU Framework Program for Research and Innovation for 2021-2027)



DMP must be submitted no later than 6 months after the start of the project.



DMP must not be complete => „living document“



DMP must be updated regularly and maintained.

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Horizon Europe (EU Framework Program for Research and Innovation for 2021-2027)



Publishing data via a repository (certified, subject-specific, generic, institutional) is mandatory.



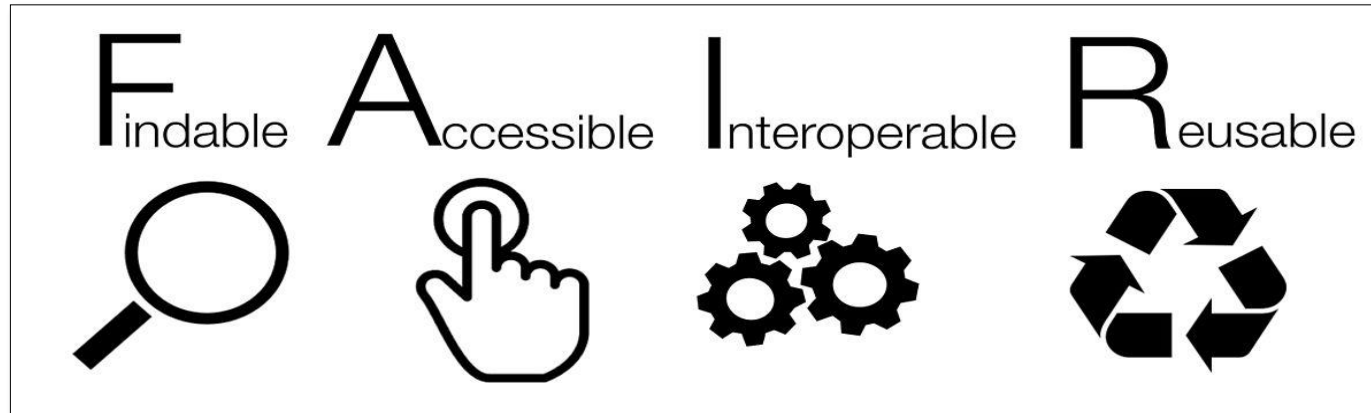
Opt-out (full or partial) is possible for reasons like privacy, trade secrets, etc. Reasons must be explained in DMP.



Data must be labelled with a CC0 or CC-BY license (or comparable).

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FAIR Principles

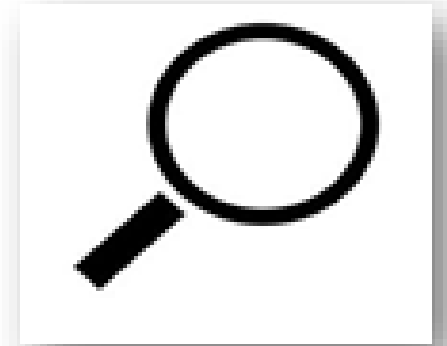


- published 2016 by Mark D. Wilkinson et al. (doi.org/10.1038/sdata.2016.18)
- **Aim:** Ensure that shared data is reusable for humans and machines

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Horizon Europe – Findable

- Data is labelled with a persistent identifier (PID) like DOI.
- Data is described with metadata and by using a metadata schema.
- Search keywords are provided in the metadata.
- Metadata is machine-readable (XML or JSON format).

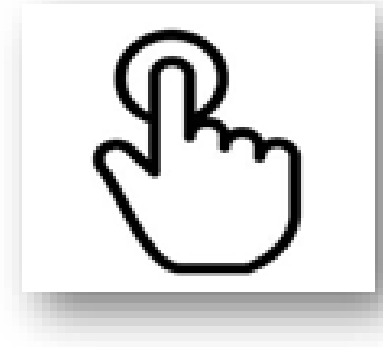


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Horizon Europe – Accessible

Repository

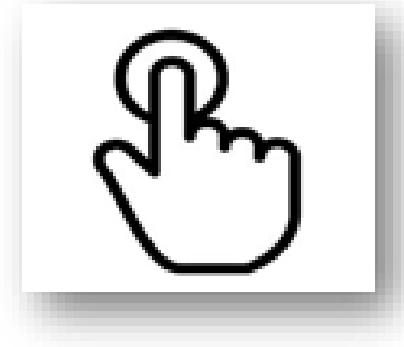
- Data is deposited in a trusted repository (certified, subject-specific, generic, institutional).
- Repository assigns persistent identifier to dataset like DOI.



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Horizon Europe – Accessible

Data



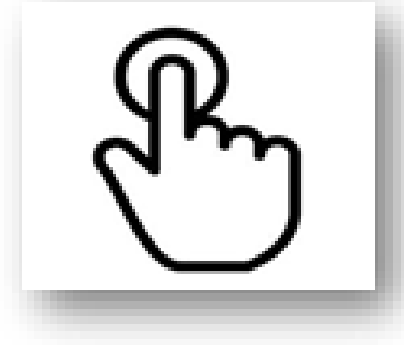
- All data is published. If not, then it must be explained.
- If there is an embargo period, the reason and duration must be mentioned.
- If access is restricted, the permission management must be described.

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Horizon Europe – Accessible

Metadata

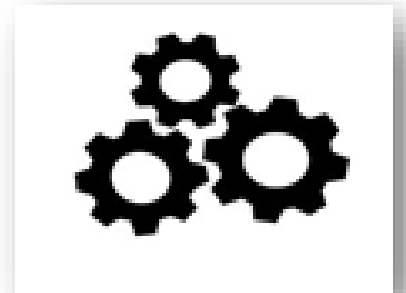
- Metadata is openly available and licensed under CC0.
- Information about archive period is provided.
- Documentation or reference on it is included in the dataset.



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Horizon Europe – Interoperable

- Information about how the data will be made interoperable according to community standards are provided like
 - metadata schemas,
 - controlled vocabularies,
 - file formats,
 - etc.
- References to other datasets are included.



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Horizon Europe – Reusable

- Information about the documentation type (e.g. README file) is provided.
- Information about the license is given.
- The quality assurance measures are described.



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Horizon Europe - DMP Template

		
		
Horizon Europe		
Data Management Plan Template		
Version 1.0 05 May 2021		

EU Grants: Data Management Template (HE)-V1.0 – 05.05.2021

HISTORY OF CHANGES		
Version	Publication date	Changes
1.0	05.05.2021	▪ Initial version
		▪



Number of the version

Template

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Horizon Europe - DMP Template

Data Summary:

- Purpose of data generation
- Data type
- File format
- Data volume
- Provenance of data
- Who could reuse the data?
- Etc.

FAIR data:

Measures to make the data findable, accessible, interoperable and reusable.

EU Grants: Data Management Template (HE)-V1.0 – 05.05.2021

The Horizon Europe Model Grant Agreement requires that a data management plan (DMP) is established and regularly updated. The use of this template is recommended for Horizon Europe beneficiaries. In completing the sections of the template the requirements for research data management of Horizon Europe as described in article 17 and analysed in the Annotated Grant Agreement, article 17, must be addressed.

1. Data Summary

Will you re-use any existing data and what will you re-use it for? State the reasons if re-use of any existing data has been considered but discarded.

What types and formats of data will the project generate or re-use?

What is the purpose of the data generation or re-use and its relation to the objectives of the project?

What is the expected size of the data that you intend to generate or re-use?

What is the origin/provenance of the data, either generated or re-used?

To whom might your data be useful ('data utility'), outside your project?

2. FAIR data

2.1. Making data findable, including provisions for metadata

Will data be identified by a persistent identifier?

Will rich metadata be provided to allow discovery? What metadata will be created? What disciplinary or general standards will be followed? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.

Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?

Will metadata be offered in such a way that it can be harvested and indexed?

2.2. Making data accessible

Repository:

Will the data be deposited in a trusted repository?

Have you explored appropriate arrangements with the identified repository where your data will be deposited?

Does the repository ensure that the data is assigned an identifier? Will the repository resolve the identifier to a digital object?

Data:

Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why, clearly separating legal and contractual reasons from intentional restrictions. Note that in multi-beneficiary projects it is also possible for specific beneficiaries to keep their data closed if opening their data goes against their legitimate interests or other constraints as per the Grant Agreement.

If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.

Will the data be accessible through a free and standardized access protocol?

If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?

How will the identity of the person accessing the data be ascertained?

Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?

Metadata:

Will metadata be made openly available and licenced under a public domain dedication CC0, as per the Grant Agreement? If not, please clarify why. Will metadata contain information to enable the user to access the data?

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Horizon Europe - DMP Template

Further information:

- Information about further research output like software, models, etc.
- Resources and responsibilities
- Data security
- Ethics
- Other issues: RDM is according to the guidelines of the FZ Jülich, institute-specific guidelines, etc.



EU Grants: Data Management Template (HE): V1.0 - 05.05.2021

How long will the data remain available and findable? Will metadata be available to remain available after data is no longer available?

Will documentation or reference about any software be needed to access or read the data be included? Will it be possible to include the relevant software (e.g. in open source code)?

2.3. Making data interoperable

What data and metadata vocabularies, standards, formats or methodologies will you follow to make your data interoperable to allow data exchange and re-use within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?

In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies? Will you openly publish the generated ontologies or vocabularies to allow reusing, refining or extending them?

Will your data include qualified references¹ to other data (e.g. other data from your project, or datasets from previous research)?

2.4. Increase data re-use

How will you provide documentation needed to validate data analysis and facilitate data re-use (e.g. readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)?

Will your data be made freely available in the public domain to permit the widest re-use possible? Will your data be licensed using standard reuse licenses, in line with the obligations set out in the Grant Agreement?

Will the data produced in the project be useable by third parties, in particular after the end of the project?

Will the provenance of the data be thoroughly documented using the appropriate standards?

Describe all relevant data quality assurance processes.

Further to the FAIR principles, DMPs should also address research outputs other than data, and should carefully consider aspects related to the allocation of resources, data security and ethical aspects.

3. Other research outputs

In addition to the management of data, beneficiaries should also consider and plan for the management of other research outputs that may be generated or re-used throughout their projects. Such outputs can be either digital (e.g. software, workflows, protocols, models, etc.) or physical (e.g. new materials, antibodies, reagents, samples, etc.).

Beneficiaries should consider which of the questions pertaining to FAIR data above, can apply to the management of other research outputs, and should strive to provide sufficient detail on how their research outputs will be managed and shared, or made available for re-use, in line with the FAIR principles.

4. Allocation of resources

What will the costs be for making data or other research outputs FAIR in your project (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.)?

How will these be covered? Note that costs related to research data/output management are eligible as part of the Horizon Europe grant (if compliant with the Grant Agreement conditions)

Who will be responsible for data management in your project?

How will long term preservation be ensured? Discuss the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?

5. Data security

What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?

¹ A qualified reference is a cross-reference that explains its intent. For example, X is regulator of Y is a much more qualified reference than X is associated with Y, so X use also Y. The goal therefore is to create as many meaningful links as possible between metadata resources to enrich the contextual knowledge about the data. [Source: https://www.go-fair.org/fair-principles/3-metadata-include-qualified-references-metadata/](https://www.go-fair.org/fair-principles/3-metadata-include-qualified-references-metadata/)

5

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Horizon Europe – Comparison

Common dmp structure	DMP (Horizon Europe)
1. Project description 2. Data and methods 3. Store data 4. Archive data 5. Share and publish data 6. Resources and responsibilities	1. Data set description 2. Standards and metadata 3. Name and persistent identifier for the data-sets 4. Curation and preservation methodology 5. Data sharing methodology 6. Output management, for research outputs other than data and publications 7. Costs and personnel related to RDM (see Horizon Europe Programme Guide, Version 1.0, 17 Juni 2021, pages 45, 46)

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Research funders– Comparison

1. Project description
2. Data and methods
3. Store data
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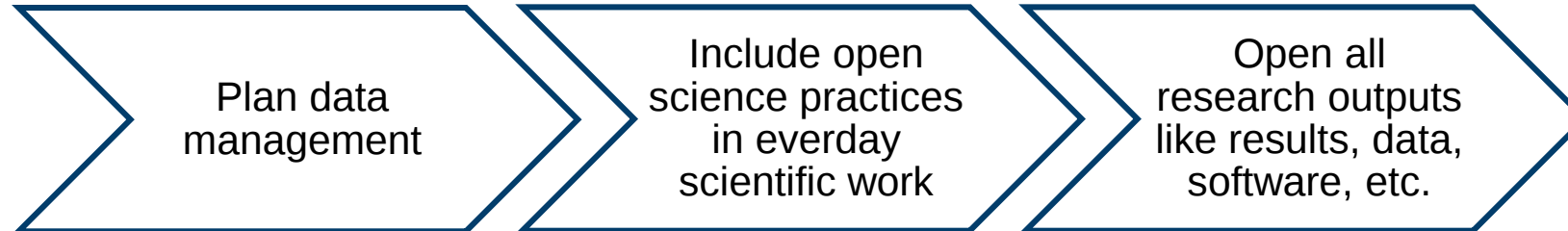
RDM in the proposal (DFG)	Utilization Plan (BMBF)	DMP (Horizon Europe)
1. Characteristics and scope of data 2. Documentation and data quality 3. Storage and technical archiving 4. Legal obligations and conditions 5. Enabling subsequent reuse and long-term accessibility 6. Responsibilities and resources (see Proposal Preparation Instructions)	1. Economic utilization 2. Scientific-technical utilization 3. Scientific and economic further developments/projects 4. Knowledge transfer	1. Data set description 2. Standards and metadata 3. Name and persistent identifier for the data-sets 4. Curation and preservation methodology 5. Data sharing methodology 6. Output management, for research outputs other than data and publications 7. Costs and personnel related to RDM (see Horizon Europe Programme Guide, Version 1.0, 17 Juni 2021, pages 45, 46)

RDM AND RESEARCH FUNDERS: AN UPDATE

Outlook

As open as possible, as closed as necessary.

- Research funding agencies will focus on open science.
- Requirements will become more and more detailed.



TEAM RESEARCH DATA OF THE CENTRAL LIBRARY

Contact



Get in touch with us:

forschungsdaten@fz-juelich.de

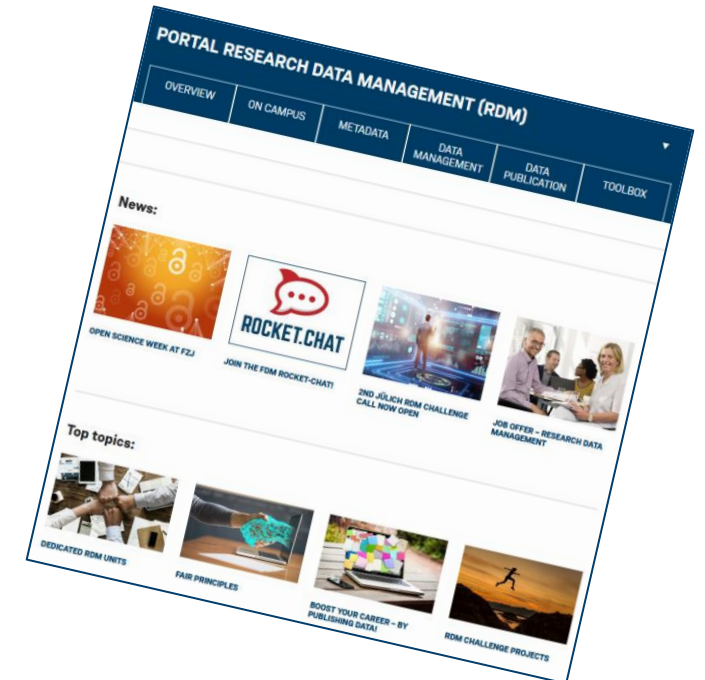
Website (intranet):

[Research Data Management](#)

[RDM Portal](#) (intranet)

RocketChat channels:

[#fdm](#) and [#fdm-announce](#)

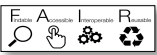


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