



UNIVERSITÀ  
DI TRENTO



THE GENERAL PRINCIPLES OF OPEN SCIENCE | 2025

Module 5

## **DATA MANAGEMENT PLAN**

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## The Data Steward





## Duties of the Data Steward

### Data Management

- Acting as a point of contact for data management inquiries
- Assisting researchers in developing DMPs that outline how data will be collected, stored and shared, etc.
- Ensuring DMPs adhere to policies and regulations
- Staying up-to-date on relevant policies, regulations and best practices, also by networking activities

### FAIR principles

- Promoting and facilitating the application of FAIR principles
- Guiding researchers on data sharing best practices and appropriate repositories

### Training

- Providing data management training and support to researchers on tools, infrastructures and techniques



## Skills4EOSC and ICDI

### **Skills4EOSC** (Skills for the European Open Science Commons)

- Mapping career profiles related to Open Science (e.g. data steward) through creating the Minimum Viable Skillset
- Creating a shared framework for the recognition of competences
- Offering training on Open Science
- Coordinating national, regional and thematic competence centres on Open Science and European Open Science Commons

Skiis  
4 eosC

Skills4EOSC  
Website |



### **On the national level: ICDI** (Italian Computing and Data Infrastructure)

- Promoting Open Science
- Disseminating and implementing FAIR data management practices
- Strengthening national participation in the European Open Science Cloud (EOSC)
- Forum for collaboration among major Italian research institutes
- Supporting and promoting the role of data stewards in Italy

ICDI

ICDI website |





### **CIDS – Community of Italian Data Stewards strategic objectives:**

- To create a recognized, cooperative and training-based professional community
- To systematize existing skills and experiences
- To create opportunities for sharing and developing of new competences
- To support the adoption of best practices for research data management
- To promote the role of the data steward

*Zenodo page of the Italian  
Data Steward Community |*





## Open Science Café

- The Open Science Café is a monthly appointment with topics and news from the world of Open Science, designed for the Italian scientific community.
- It aims to inform and discuss various aspects related to open science in an informal way, during coffee break time.
- Each episode lasts one hour and focuses on a specific theme, always leaving space for discussion.



Open Science Café  
Courses |







## Sharing Research Outputs







## Maximize research data impact via FAIR principles (I)

### FINDABLE



**Make sure that data is easy to find by humans and computers**

- machine-readable
- with a globally unique and persistent identifier
- with rich metadata, essential for indexing and searching
- stored in a public «trusted» repository

### ACCESSIBLE



**Provide instructions about how data can be accessed**

- Data is not necessarily open: authorization and authentication
- Metadata is always accessible, even when data is no longer available
- Timing information (e.g. embargo, long term preservation)
- Protocols and tools needed to access and read the data should be open and free

[Go-fair.org](https://go-fair.org) |





## Maximize research data impact via FAIR principles (II)

### INTEROPERABLE

**Design data in order to be integrated with other data and systems**



- Use standard formats for data and metadata
- Use standard vocabularies, methodologies and tools
- Curate data provenance

### REUSABLE

**Facilitate data reuse**



- Release data with an open license (e.g. CC-BY)
- Provide documentation
- Provide training and dissemination material

### NOTE:

the FAIR principles apply to data, metadata and infrastructures

[Go-fair.org](https://go-fair.org) |





## THIS IS **NOT FAIR!**

### **Release data on the project website / ResearchGate / servers of the university**

- It is not a trusted repository
- Does not ensure effective indexing, search and long term availability

### **Release data in MS Excel**

- It is not an open software
- Data is not in a standard format

### **Release data with a restrictive or non standard license**

- It does not facilitate reuse
- It makes difficult to replicate scientific results



## Data Management Plan





## The Data Management Plan (DMP)

### PLANNING

- Plan all the aspects related to the data and other research outputs that will be produced or reused
- Revise the plan regularly to accommodate for changes in the plan

### CONTENT

- Describe their purpose and utility
- Describe how they will be handled before, during and after the research has been completed
- Describe how FAIR principles will be applied
- Describe costs, infrastructures employed and responsibilities
- Describe ethical, security, intellectual property and other legal issues

### OBLIGATIONS AND OPPORTUNITIES

- In some context is it mandatory to release a DMP
- The DMP is in any case extremely useful to plan work and mitigate risks







## Horizon Europe DMP official template

1. Data Summary
2. FAIR data
  - 2.1. Making data findable, including provisions for metadata
  - 2.2. Making data accessible
  - 2.3. Making data interoperable
  - 2.4. Increase data re-use
3. Other research outputs
4. Allocation of resources
5. Data security
6. Ethics
7. Other issues





## University of Trento official DMP Template

EU Grants: Data management plan (HE): V1.1 – 01.04.2022

← Based on the HE template

### 2.3. Making data interoperable

Please describe what sort of vocabularies, standards, formats or methodologies you are going to follow for your data and metadata. Formats are supposed to be open in a way that data can be read by free software. Standard terms should be used in data, metadata and documentation. When possible, apply community-endorsed interoperability best practices and describe here which ones. Vocabularies can be also used to ensure the usage of standard terminology for data. If your data contain words (and not just numbers), such words, when denoting well-known entities in your research domain, should be standard terms.

← Guidelines in blue

“We will use common formats that do not require any proprietary software to read files. In particular, geographic coordinates in Dataset 1 will be represented in the widely used WGS84 coordinate system and follow the ISO 6709 standard representation. This will allow us to be interoperable with standard map viewers and to be compliant with OpenStreetMap. As a general approach, we will try our best to minimize technological barriers and to ensure access and aggregation of data into future datasets. The terminology used within data, metadata and documentation will be in English language, aligning with widely accepted vocabularies in the reference scientific community. In particular, for geographic categories will use GeoNames feature codes (<https://www.geonames.org/export/codes.html>).”

← Examples in black

Consider also internal structure of files and any specific way it needs to be encoded in your domain.

Zenodo.org |





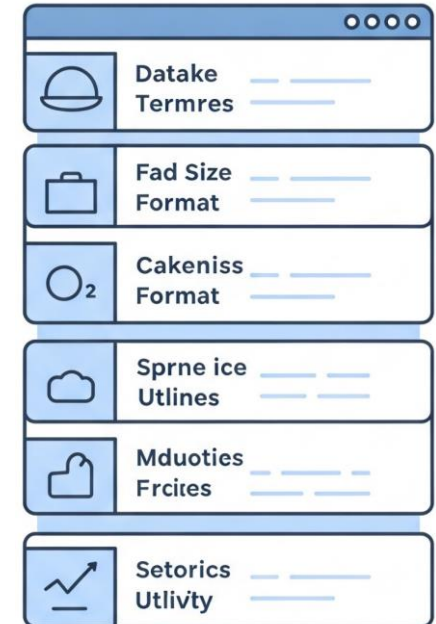
## The DMP template – Data summary







### GOALS AND OBJECTIVES

- Provide a brief description of the purpose of the project
- Explain the crucial role of the data in achieving the intended results

### DATA AND OTHER RESEARCH OUTPUTS

- Provide a list of the items that will be produced or reused
- Give them a name to facilitate references within the DMP
- Provide information about their expected nature, origin, format and size
- Explain the role of the project partners in producing or using them
- Explain their function within the project
- Explain their utility outside the project



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## The DMP template – FAIR data

### FINDABLE



- Which identifiers (e.g. DOI)
- Which repositories (e.g. Zenodo and GitHub) and why
- Which metadata (e.g. Dublin Core) and keywords will be provided to maximize visibility

### ACCESSIBLE



- Which data will be made public and by when
- If something will be kept closed or restricted, explain timing, why and how to access
- Provide documentation about software needed to open and process them

### INTEROPERABLE



- Which formats will be used and why
- Which vocabularies, methodologies and tools to represent data and provenance
- Explain any necessity to integrate data and systems

### REUSABLE



- Which licenses will be chosen and why
- Describe quality assurance policies and provide instructions for reproducibility
- Describe documentation, dissemination and training material
- Describe potential usages and beneficiaries



## The DMP template – Other sections

### OTHER RESEARCH OUTPUTS

- Describe any other output of your research (e.g. software, websites, training material)
- Describe how FAIR principles will be applied to such outputs
- You may also describe your strategy towards open access to scientific publications

### ALLOCATION OF RESOURCES

- Describe tools and infrastructures that you will need (e.g. equipment, storage, software ...)
- Describe tasks and responsibilities (e.g. granting access, anonymizing data)
- Describe corresponding costs

### DATA SECURITY

- Describe how data will be handled during and after the research (data flows)
- Describe measures that will be implemented (e.g. firewalls, access control, backup)

### ETHICS

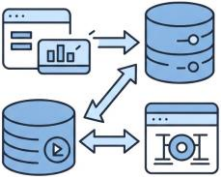
- Describe any ethical and legal issue (e.g. privacy, IPR, medical protocols, usage of AI)
- Describe measures that will be implemented (e.g. DPIA, anonymization, DTA, MTA, NDA)





## Final recommendations

### PLANNING



- Plan as much as you can
- Identify the datasets and other research outputs that you will produce or reuse
- Identify corresponding data flows and processes

### WRITING



- Use the UniTrento DMP template and adapt it to the specificities of your research
- Release it as a public deliverable with a CC-BY license
- Update it regularly
- Change the tenses (first future, then present and past) between one version of the DMP and another according to the project status

### COMPLIANCE



- Pay attention to the difference between data and publications and to the difference between data and other research outputs
- Pay attention to laws and regulations, especially GDPR and IPR issues
- Do not underestimate costs and necessary resources: nothing is free! Ask yourself: Do I have all the necessary skills, human resources, tools and infrastructures? Who pays for them (project, department, university, others)?



## Getting Directions at UniTrento





## Supporting units at UniTrento



Research Ethics  
Committee |



Open Science  
Committee |



Data Protection  
Committee |



The Data Protection  
Officer |



Patent  
Commission |



Research Ethics and  
Integrity Office |



Digital Services for  
Research Office |



Data Protection  
Office |



Valorization and Impact  
of Research Division |



Thank you for your attention!

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