

Let's do introductions

What's your name & department?

Thanks for sharing your data!

**Establishing your unique identity as a
researcher is the start of Research
Data Management**

How can we identify ourselves uniquely?

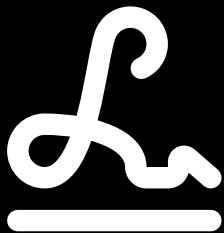


**Open
Research
Contributor ID**

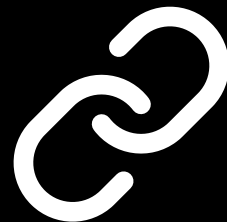
(TU/e is a member institute)

A persistent identifier for a research contributor

Why ORCID ID?



Your unique ID



**A linking pin for your
research outputs**

**Your researcher
identity becomes
part of the **open
data ecosystem****



Do you have your ORCID ID?

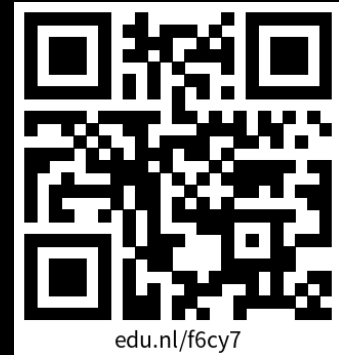
Create your ORCID ID

1. Visit **orcid.org**
2. Create your ORCID ID
3. Make sure your information is up-to-date
4. Add your ORCID ID to your Pure profile at **pure.tue.nl**

ORCID



Pure



**Everyone has an ORCID ID
registered to your Pure account?**


Let's do an activity

Activity: Whose ORCID ID is it?

- 1. Pair up with your neighbors**
- 2. You will receive ORCID IDs**
- 3. Find out the names for ORCID IDs**

Research Data Management

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 orcid.org/0000-0001-5482-8370



DOI: [10.53962/gdkf-a36m](https://doi.org/10.53962/gdkf-a36m)

This work is marked with CC0 1.0



After this part, you'll be able to...

A red hexagon with the text "Open & FAIR Data" inside in white.

Open &
FAIR Data

Evaluate your own research data management practices in the **research data life cycle**

Apply strategies to make your research data **Findable, Accessible, Interoperable and Reusable (FAIR)**

"Research Data"



Data itself

Nutrition Facts	
4 servings per container	
Serving size 1 1/2 cup (208g)	
Amount per serving	
Calories	240
% Daily Value*	
Total Fat 4g	5%
Saturated Fat 1.5g	8%
Trans Fat 0g	
Cholesterol 5mg	2%
Sodium 430mg	19%
Total Carbohydrate 46g	17%

Metadata

“Research Data Management”

the way you collect, analyze, store,
share, archive and publish research
data, to satisfy the needs of **current and
future data users**

ORIGIN

1	attaaagggtt	tataccttcc	caggtaacaa	accaaccaac	tttcgatctc	ttgtagatct
61	gttctctaaa	cgaactttaa	aatctgtgtg	gctgtcactc	ggctgcatgc	ttagtgcact
121	cacgcagtat	aattaataac	taattactgt	cgttgacagg	acacgagtaa	ctcgtctatc
181	ttctgcaggc	tgcttacggt	ttcgtccgtg	ttgcagccga	tcatcagcac	atctagggtt
241	cgtccgggtg	tgaccgaaag	gtaagatgga	gagccttgtc	cctggtttca	acgagaaaac
301	acacgtccaa	ctcagtttgc	ctgtttttaca	ggttcgcgac	gtgctcgtac	gtggcctttgg
361	agactccgtg	gaggaggtct	tatcagaggc	acgtcaacat	cttaaagatg	gcacttgtgg
421	cttagtagaa	gttgaaaaag	gcgtttttgcc	tcaacttgaa	cagccctatg	tgttcatcaa
481	acgttcggat	gctcgaactg	cacctcatgg	tcatgttatg	gttgagctgg	tagcagaact
541	cgaaggcatt	cagtacggtc	gtagtgggtga	gacacttggt	gtccttgtcc	ctcatgtggg
601	cgaataacca	gtggcttacc	gcaaggttct	tcttcgtaag	aacggtaata	aaggagctgg
661	tggccatagt	tacggcgccg	atctaaagtc	atttgactta	ggcgacgagc	ttggcactga
721	tccttatgaa	gattttcaag	aaaactggaa	cactaaacat	agcagtgggtg	ttaccctgtga
781	actcatgcgt	gagcttaacg	gaggggcata	cactcgctat	gtcgataaca	acttctgtgg
841	ccctgatggc	taccctcttg	agtgcattaa	agaccttcta	gcacgtgctg	gtaaagcttc
901	atgcactttg	tccgaacaac	tggactttat	tgacactaag	aggggtgtat	actgctgccg
961	tgaacatgag	catgaaattg	cttggtacac	ggaacgttct	gaaaagagct	atgaattgca
1021	gacacctttt	gaaattaaat	tggcaaagaa	atttgacacc	ttcaatgggg	aatgtccaaa
1081	ttttgtattt	cccttaaatt	ccataatcaa	gactattcaa	ccaagggttg	aaaagaaaaa
1141	gcttgatggc	tttatgggta	gaattcgatc	tgtctatcca	gttgcgtcac	caaatgaatg

Coronavirus genome sequence



GenBank



**Open & FAIR Data drive innovation
(& save lives)**

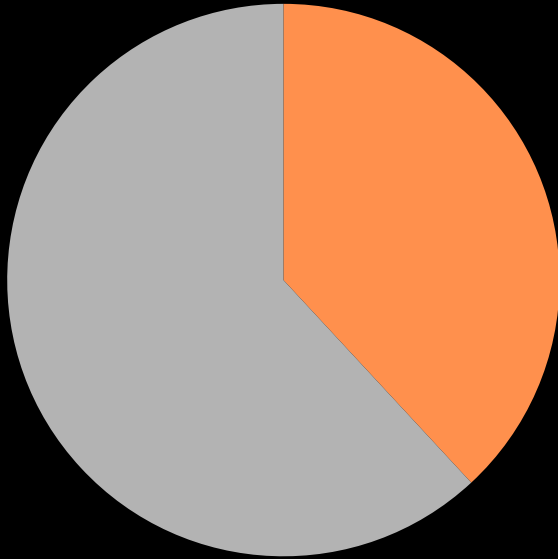


Research Data as a public good

Photo by [Will van Wingerden](#) on [Unsplash](#)
unesco.org/en/open-solutions/open-data

**Data stewardship:
Taking care of data well**

Journals are asking for data



**38% requiring
data sharing**

Based on 2017 data from 709 journals in life, health, and physical sciences.

Kim, J., Kim, S., Cho, H.-M., Chang, J. H., & Kim, S. Y. (2020). Data sharing policies of journals in life, health, and physical sciences indexed in Journal Citation Reports. *PeerJ*, 8, e9924.
<https://doi.org/10.7717/peerj.9924>

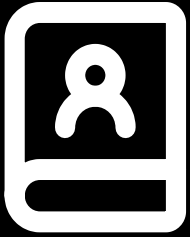
What do "Open" & "FAIR" mean?

Open data is data
anyone can **freely**
access, use, modify, and
share for **any purpose**

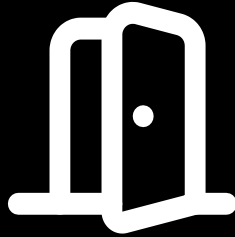
**Not all data can
be shared openly**

FAIR Data

Findable



Accessible



Interoperable



Reusable



Open Data

FAIR Data

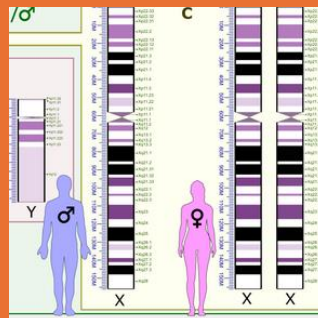
Open

kaggle



FAIR & Open

Closed



Not FAIR

FAIR

Open \neq FAIR

Metadata can always
be made **Open & FAIR**

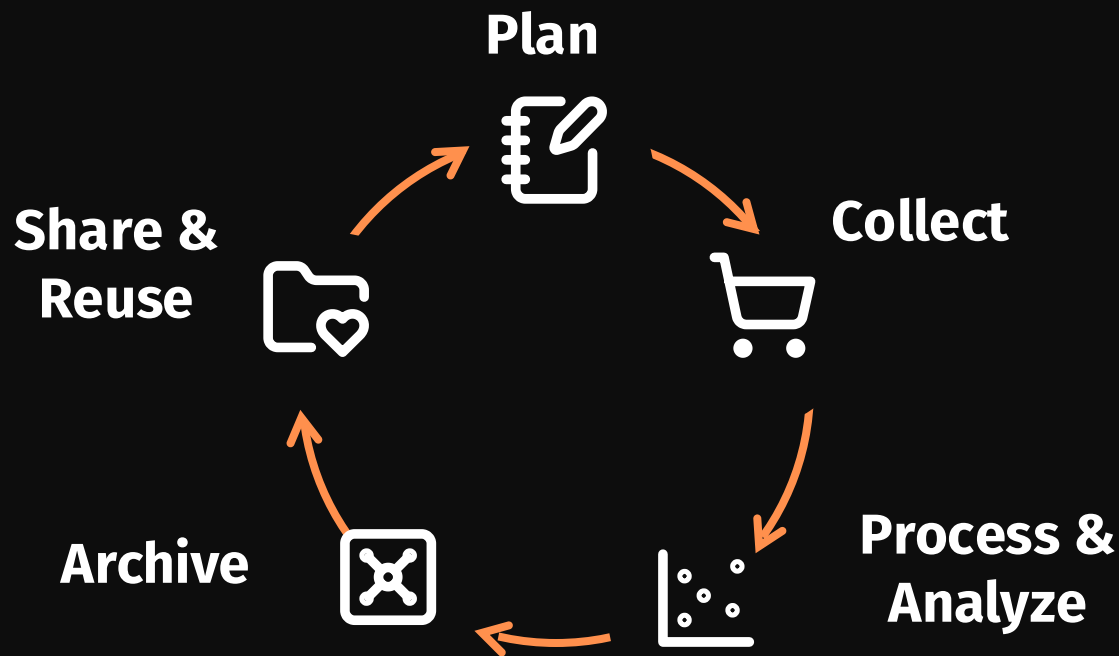
Nutrition Facts	
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Calories	240
% Daily Value*	
Total Fat 4g	5%
Saturated Fat 1.5g	8%
Trans Fat 0g	
Cholesterol 5mg	2%
Sodium 430mg	19%
Total Carbohydrate 46g	17%

What happens to your data at the end of the project?

Research Data Management can go wrong



We can also do it better: efficient & sustainable



Community standards, funders, and laws **require** good RDM



**Code of Conduct for
Research Integrity**

TU/e RDM Policy



Funders



GDPR

Good RDM **benefits you** and your research community



Not losing data



Recognition



Protection for integrity



**More efficient & sustainable
science**

How to plan for your research project



Data Management Plan (DMP)

A **living document** for the research project

Funding agencies require data management plans, reviewed by a data steward

At TU/e, you can prepare a Data Management Plan on the **Research Cockpit** (more on this later)

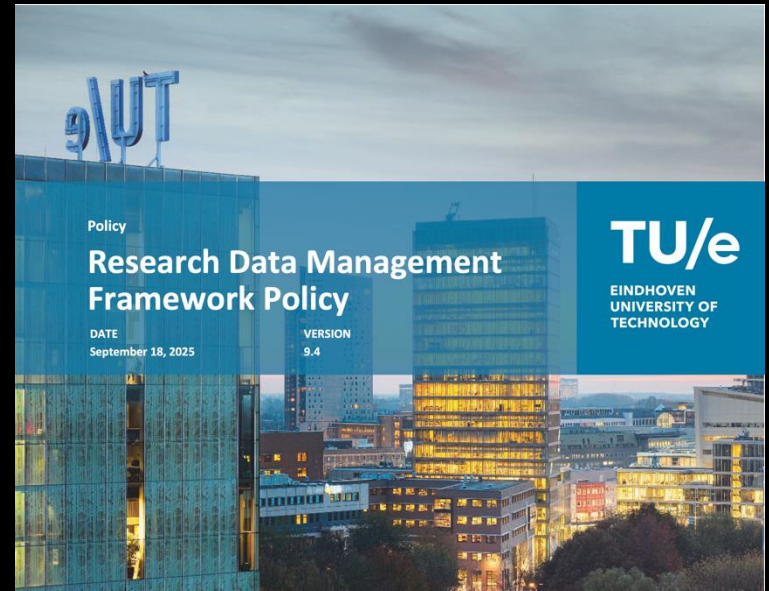


RDM Policy: Data Management Plan is required for all projects

Uploaded to Hora Finita at:

- **Approved DMP at the 9-month evaluation**
- **Approved DMP in the PhD defense package**

TU/e Research Data Management Framework Policy



What kind of data do you have?

A. Data from human participants

B. Sensitive Data

C. Data from external parties



Ethical review is required for all research involving human data at TU/e

**including anonymous / secondary data*

ERB application can be submitted after creating a Data Management Plan on Research Cockpit

Research Cockpit: cockpit.research.tue.nl

Ethical Review | TU/e : tue.nl/sharepoint.com/sites/intranet-ethical-review



**Personal Data: Any data that can be
traced back to a living person**

**Normal
Personal Data**

**Special Category
Personal Data**



GDPR prohibits processing **special categories of personal data** except certain circumstances

- Racial or ethnic origin
- Political opinions
- Religious or philosophical beliefs
- Trade union membership
- Genetic and biometric data for identification
- Sex life or sexual orientation
- Health Data

Data Processing Impact Assessment (DPIA) may be needed

Contact your data steward if you plan to process special categories personal data



If you are getting data from an external party, it's best to have **an agreement about data**

Will your party agree to publish your data?

Permission to publish the Data	<p>To meet the principles of findability, accessibility, interoperability, and reusability (FAIR), (part of) the Data may be published in anonymous form if requested by a scientific journal:</p> <p><input type="checkbox"/> yes</p> <p><input type="checkbox"/> no</p>
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Data Sharing Agreement Template TU/e Receiver



When writing a grant proposal, it's best to reserve funding for RDM-related costs

"Data management and making the data FAIR (assigning DOI, describing the data, assigning metadata to the data, etc.) is part of the ongoing research activities of involved researchers. Although we do not foresee any extra expenses, a budget of €5000 is reserved for RDM purposes."

We'll try out the Research Cockpit later today

**Collecting
Phase**



Set your **folder structure** and document it in the README file

```
.  
├── README.md  
├── metadata.json  
├── data/  
│   ├── raw  
│   └── processed  
├── code/  
├── output/  
├── documentation/  
│   ├── methods  
│   ├── lab_notebooks  
│   └── administration
```

Make a **README** file to make your data human-friendly

No one can read your mind—not even you in the future

A **metadata** file makes your data machine-readable

You can complete a dataset form on 4TU.ResearchData or Zenodo, download the metadata file, and save it together with your data.

*You can also manually create metadata file using [DataCite Metadata Generator](https://github.com/dhvlab/gwi-uni-muenchen.de/datacite-generator)



Photo by [AltumCode](#) on [Unsplash](#)

[DataCite Metadata Generator: dhvlab.gwi-uni-muenchen.de/datacite-generator/](https://github.com/dhvlab/gwi-uni-muenchen.de/datacite-generator/)

Name files **meaningfully, distinctly,** and **consistently**

No special characters. Whitespaces are discouraged.

Case style: camelCase, PascalCase,
snake_case, or kebab-case?

Use ISO date format: “2024-07-03”

Storage options at TU/e

Storage Finder at Solution Searcher

Search

Please indicate your requirements by selecting the best answer to the questions that are relevant for your project.

Do you need to share your data ?

☒ No ☐ Yes, internally ☐ Yes, externally

Is the total volume of your data exceeding 1TB?

☒ No ☐ Yes

What is the confidentiality level required for the data?

☒ Low or Middle ☐ High

Do you need low latency / high performance for working with your data?

☒ No ☐ Yes

<h3>TU/e Network Drive</h3> <p>On-premise storage of research data with group folders or project folder within TU/e</p> <p>request</p>	<h3>SURF Research Drive</h3> <p>National cloud service for storing, synchronizing and sharing files tied to research projects</p> <p>request details</p>	<h3>MS OneDrive</h3> <p>Cloud storage that lets you save, share, and access files from anywhere</p> <p>details</p>
<h3>MS Teams</h3> <p>Cloud platform for collaboration through chat, video meetings, and shared files</p> <p>request details</p>	<h3>MS SharePoint</h3> <p>Cloud platform for document management and content sharing for teams</p> <p>request details</p>	<h3>Storage Intake</h3> <p>Have you found no storage? Discuss your requirements with a member of the Research IT team</p> <p>details</p>

<https://openpar.pages.tue.nl/solution-searcher/category-storage.html>

Where do you store your data?

A. TU/e Network Drive

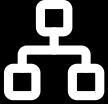



D. OneDrive

B. SURF Research Drive

E. Other

C. Teams / SharePoint

TU/e Storage Options

		Security	Scalability
	Network Drive (External sharing not possible)	 Best	 Best (~100 TB)
	Research Drive	Good	Good (~10 TB)
	Teams / SharePoint	Good	OK (~2.5 TB)

*OneDrive is recommended for student project only

**You can encrypt your data using
Cryptomator in a vault and store
it in any storage solution**



**You can manage access using
Cryptomator Hub**

Learn more about Cryptomator Hub on the Research Cockpit:
<https://cockpit.research.tue.nl/helpcenter/research/portal/11/article/2452390165>

Only sending data one-time? Then use SURFfilesender

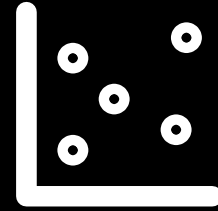
Remember to turn on **encryption**



SURFfilesender: filesender.surf.nl/

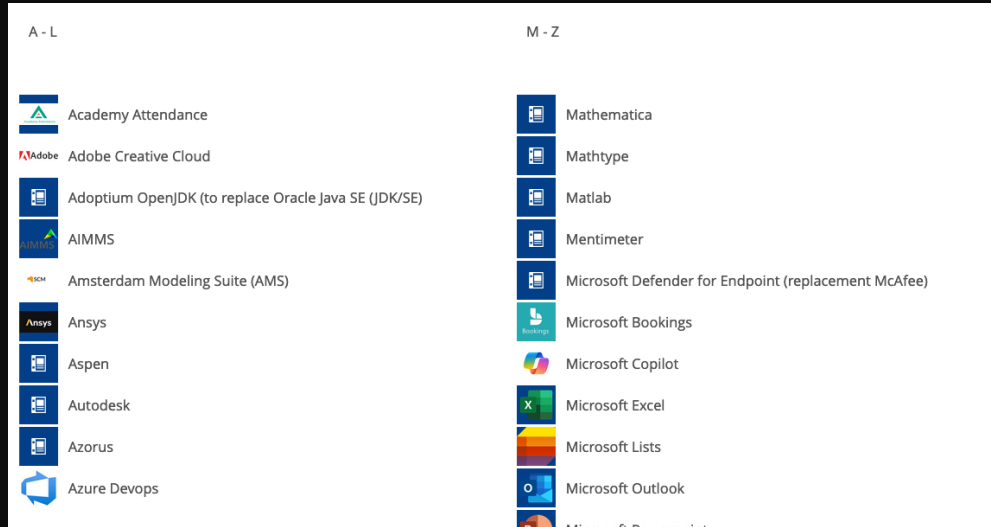
Do not send data over email!

Processing & Analyzing Data



You can find available tools on Topdesk

TU/e Software | Topdesk



The recommendation is to
use **open-source tools**,
whenever possible.



Python



R

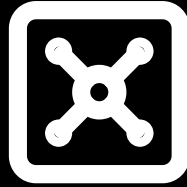
If the original dataset is in a proprietary format, **convert it to an open file format**.

e.g., text file, HDF5, NetCDF

Do you need to use proprietary tools?

Any opportunities for using open tools?

Archiving



Share & Reuse



Archiving: keeping data to demonstrate the **integrity of research**

Usually, each publication
requires an archival package

Archival package is only
accessed when it's needed



Photo by Jason Dent on Unsplash

Sharing: Creating a publication data package to **share your data**

The goal is to share data with future
data users (can be you)



Publication Package

Archival Package

**Main
Goal**

To share



**To demonstrate
integrity**



Access

Public



By default

Restricted



You can deposit data in a **data repository** & **connect your publication**.

You can use generic repositories, such as [4TU.ResearchData](#) & [Zenodo](#).

Your discipline may have a specialized data repository. Visit re3data.org to find out.



When sharing your research, assign
an **open license**, for example

Data, documentation,
non-code materials



CC BY 4.0

Code



MIT

<https://chooser-beta.creativecommons.org/>
<https://choosealicense.com/>

Share your data as openly as possible as closed as necessary

That said, look out for limitations related to privacy, intellectual property, or data agreements

The future user of your data may be you

**Managing Research Data can be
overwhelming...**

**It's best to plan ahead to
avoid chaos at the end**

Effort

**“No time to spend for
planning now.”**

**“What did I do
again?”**

**“Where’s my
data?”**

Project Start

Project End



Ideal:

Start with the end in mind

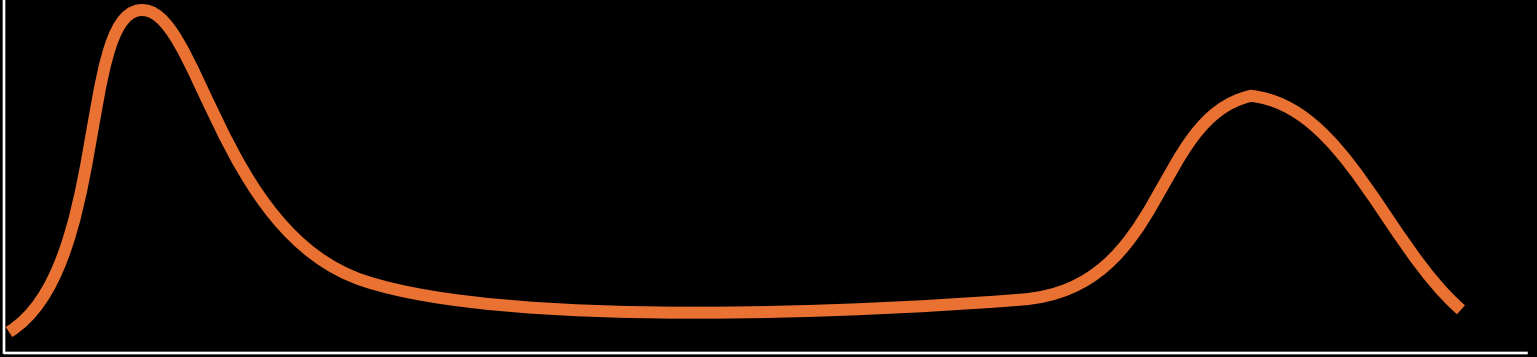
Effort

**Completing a Data
Management Plan**

**Data publication
& archiving as
planned**

Project Start

Project End



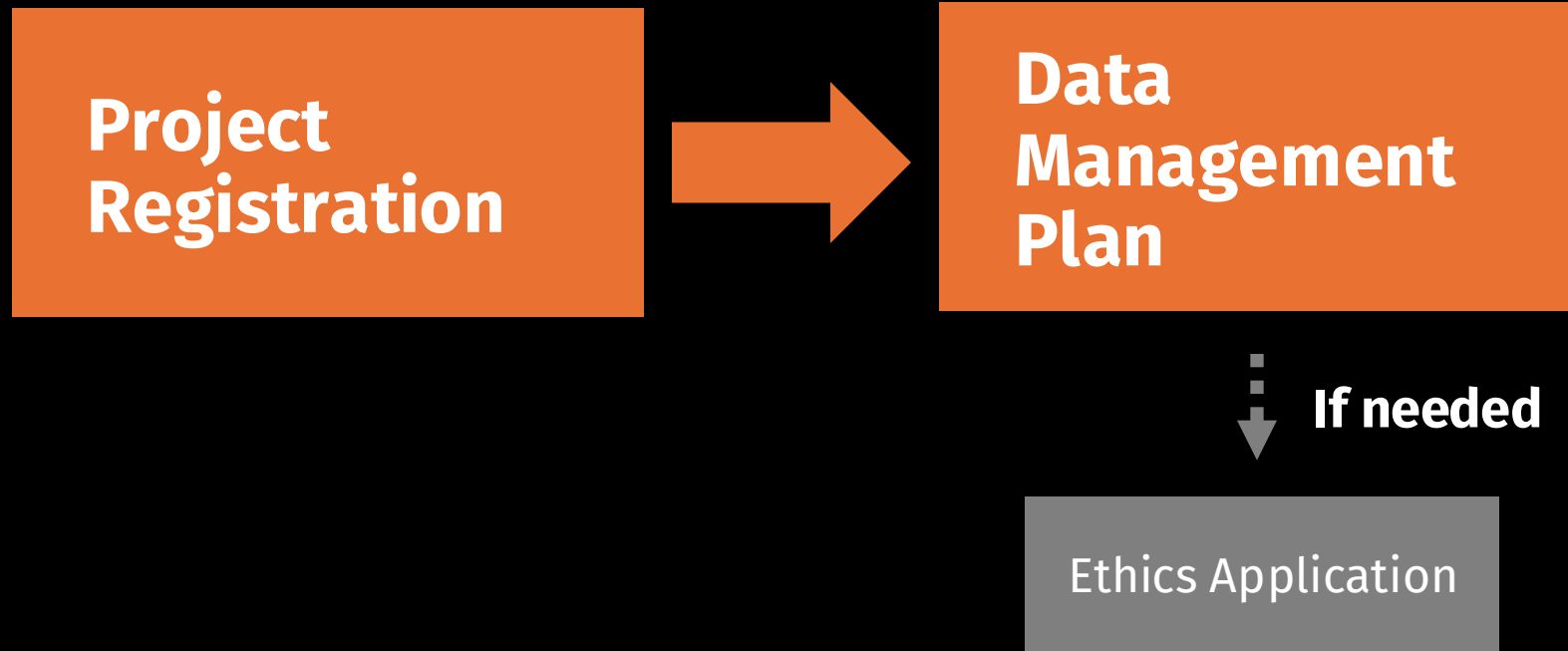
Research Cockpit



<https://cockpit.research.tue.nl>

Let's try out the Research Cockpit!

General workflow



Project Registration

1. Visit Research Cockpit
(cockpit.research.tue.nl)
2. Find “Data Management Plan”
3. Find ”Create a Data
Management Plan
4. Fill in Research Project
Registration
5. Click “Send”



Research Project registration

Required fields are marked with an asterisk *

Project Name *

Use e.g. the name as defined in the research grant for the project.

Test Project Registration 2025-06-18

Department *

Specifying your department allows us to connect you to the right personal departmental support staff.

Applied Physics and Science Education (AP&SE) x



What stage is your research project in now?

Please select one or more options

- ☒ Plan my Research: Tasks like making a Data Management Plan (DMP), getting Ethical Review approvals, or setting up collaboration agreements.
- ☐ Do my Research: Activities like collecting, storing, analyzing or computing my data.
- ☐ Share my Research: Writing, publishing, and saving your research paper.

Do you already have an externally approved Data Management Plan (DMP) for this project? *

In the next step, you'll either receive a form to attach your externally approved DMP (this is not the pre-award data management paragraph), or you'll receive a blank DMP template to start with.

☐ Yes

☒ No

Data Management Plan (DMP)

1. Go to your avatar -> Requests
2. Find your Draft DMP
3. Fill in the information in the DMP

You can share your DMP
with your collaborators

If you no longer need the
DMP, please retract it.



Retract my DMP



Nami Sunami raised this on Today 15:44

[Hide details](#)



Data Management Plan

[OPEN FOR EDITS](#)



Data Management Plan Template



Via this template you can create (or upload) your data management plan (DMP). We know that things change, so this DMP template should be edited throughout your research project.

This template has been approved by NWO and ZonMw.

Questions: If you have questions for the data steward of your department, add them at the end of the form as a comment under "Activity".

Save: click "save" at the bottom of the form to save the information you provided, you can modify your answers in the draft status.

General Project Information

1. Project Title / Study name *

Test Project Registration 2025-06-18

**How was your experience with the
Research Cockpit?**

Don't hesitate to reach out to your Data Steward



Liz Guzman-Ramirez
Coordinator



Angela Aleksovska
EE



Davide Nardi
M&CS



Jay Nair
IE&IS



Jonathan Genora
ID



Lucia Forrová
BE



Neda Norouzi
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rdm.tue.nl

**Data Stewards | SharePoint
(login required)**

Thank you

More info on RDM

[Data Stewards | Intranet](#)

[TU/e Research Data Management Handbook](#)

[Search Storage | Storage Searcher](#)

Create a DMP/ ERB

[Research Cockpit](#)

Contact Data Steward

rdmsupport@tue.nl