

# 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?**

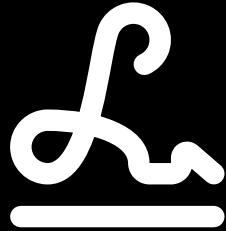


**Open  
Researcher  
Contributor ID**

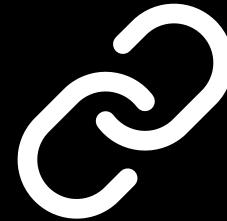
(TU/e is a member institute)

**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?**

**ORCID**

# 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**



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

This work is marked with CCO 1.0



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



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 caggttaacaa accaaccaac ttgcgatctc ttgttagatct  
61 gttctctaaa cgaactttaa aatctgtgtg gctgtcactc ggctgcattgc tttagtgcact  
121 cacgcagtat aattaataac taattactgt cggtgacagg acacgagtaa ctcgtctatc  
181 ttctgcaggc tgcttacggc ttctgtccgtg ttgcagccga tcattcagcac atcttaggtt  
241 cgtccgggtg tgaccgaaag gtaagatgga gagccttgc cctgggttca acgagaaaaac  
301 acacgtccaa ctcagttgc ctgtttaca ggttcgac gtgcgtac gtggcttgg  
361 agactccgtg gaggaggct tatcagaggc acgtcaacat cttaaagatg gcacttgtgg  
421 cttagtagaa gttgaaaaag gcgtttgcc tcaacttgc cagccctatg tggcatcaa  
481 acgttcggat gctcgaactg cacctcatgg tcatgttatg gttgagctgg tagcagaact  
541 cgaaggcatt cagtacggc gtagtggtga gacacttgg gtccttgc ctcattgtgg  
601 cggaaatacca gtggcttacc gcaagggtct tcttcgttaag aacggttaata aaggagctgg  
661 tggccatagt tacggcgccg atctaaagtc atttgactta ggcgacgagc ttggcactga  
721 tccttatgaa gattttcaag aaaactggaa cactaaacat agcagtggc ttacccgtga  
781 actcatgcgt gagcttaacg gaggggcata cactcgctat gtcgataaca acttctgtgg  
841 ccctgatggc taccctcttgc agtgcattaa agaccttcta gcacgtgctg gtaaagcttc  
901 atgcactttg tccgaacaac tggactttat tgacactaag aggggtgtat actgctgccg  
961 tgaacatgag catgaaattt cttggatcac ggaacgttct gaaaagagct atgaatttgc  
1021 gacacctttt gaaattaaat tggcaaagaa atttgacacc ttcaatgggg aatgtccaaa  
1081 ttttgttattt cccttaaattt ccataatcaa gactattcaa ccaagggttgc aaaaagaaaaa  
1141 gcttgatggc ttatggta gaattcgatc tgtctatcca gttgcgtcac caaatgaatg  
1201

# Coronavirus genome sequence



NCBI  
GenBank



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

A photograph of a grand library interior. The ceiling is high with a grid of skylights and arched windows. The walls are lined with floor-to-ceiling bookshelves filled with books. The lighting is dramatic, coming from the windows and the skylights, creating a bright central aisle and darker sections around the perimeter.

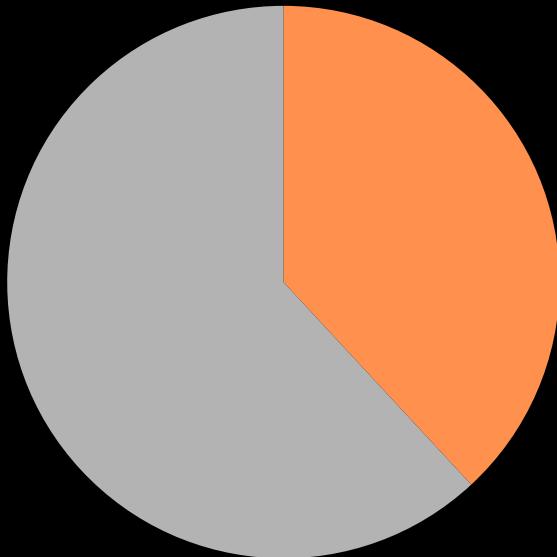
# Research Data as a public good

Photo by [Will van Wingerden](#) on [Unsplash](#)

[unesco.org/en/open-solutions/open-data](http://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>

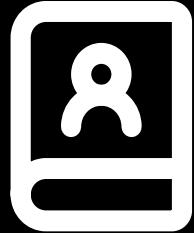
**What do “Open” & “FAIR” mean?**

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

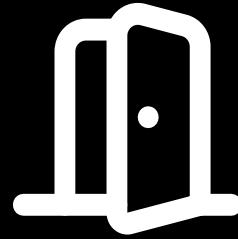
**Not all data can  
be shared openly**

**FAIR Data**

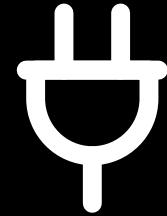
**Findable**



**Accessible**



**Interoperable**



**Reusable**



**Open Data**

**FAIR Data**

**Open**

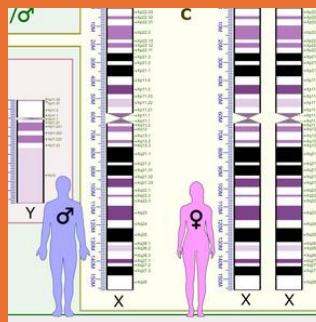
kaggle



**Closed**



**Not FAIR**



**FAIR**

**FAIR & Open**

**Open ≠ FAIR**

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

## Nutrition Facts

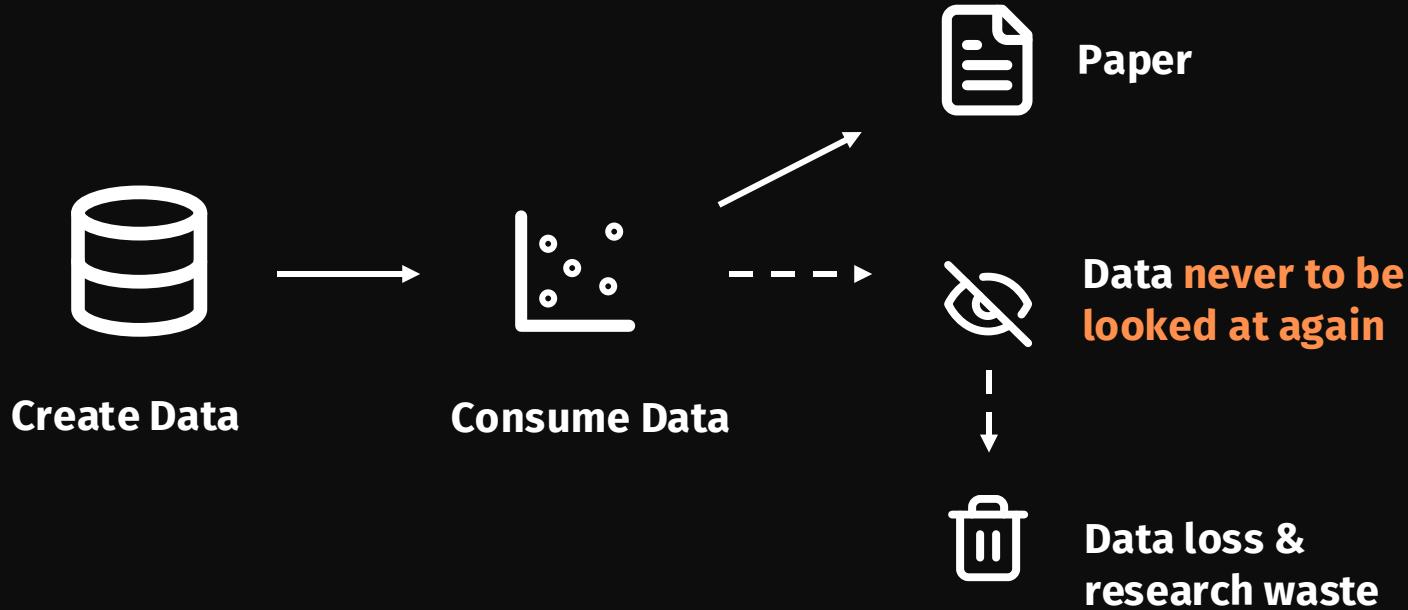
4 servings per container

**Serving size 1 1/2 cup (208g)**

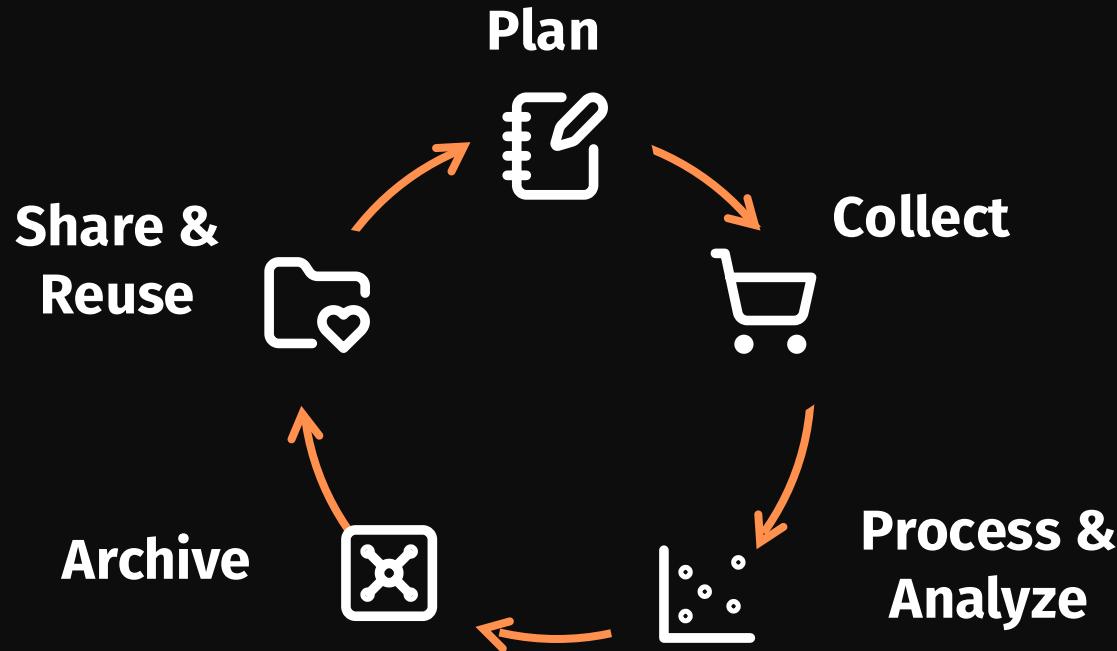
Amount per serving	
<b>Calories</b>	<b>240</b>
% Daily Value*	
<b>Total Fat</b> 4g	<b>5%</b>
Saturated Fat 1.5g	<b>8%</b>
<i>Trans</i> Fat 0g	
<b>Cholesterol</b> 5mg	<b>2%</b>
<b>Sodium</b> 430mg	<b>19%</b>
<b>Total Carbohydrate</b> 46g	<b>17%</b>

**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**

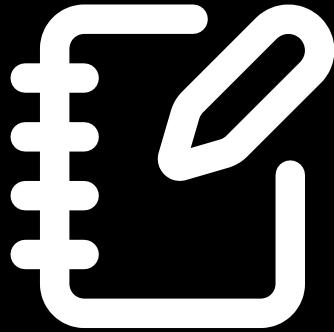


**Protection for integrity**



**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](http://cockpit.research.tue.nl)

Ethical Review | TU/e : [tuenl.sharepoint.com/sites/intranet-ethical-review](https://tuenl.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?

<b>Permission to publish the Data</b>	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: <input type="checkbox"/> yes <input type="checkbox"/> no
---------------------------------------	--

*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](#)

# 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

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

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

# Where do you store your data?

A. TU/e Network Drive

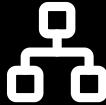
D. OneDrive

B. SURF Research Drive

E. Other

C. Teams / SharePoint

# TU/e Storage Options

		Security	Scalability
	<b>Network Drive</b> (External sharing not possible)	 Best	 Best (~100 TB)
	<b>Research Drive</b>	Good	Good (~10 TB)
	<b>Teams / SharePoint</b>	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**

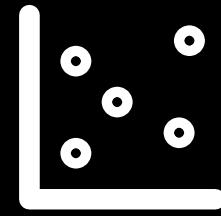
Remember to turn on **encryption**



**SURFfilesender: [filesender.surf.nl/](https://filesender.surf.nl/)**

**Do not send data over email!**

# Processing & Analyzing Data



# You can find available tools on Topdesk

## TU/e Software | Topdesk

A - L	M - Z
 Academy Attendance	 Mathematica
 Adobe Creative Cloud	 Mathtype
 Adoptium OpenJDK (to replace Oracle Java SE (JDK/SE))	 Matlab
 AIMMS	 Mentimeter
 Amsterdam Modeling Suite (AMS)	 Microsoft Defender for Endpoint (replacement McAfee)
 Ansys	 Microsoft Bookings
 Aspen	 Microsoft Copilot
 Autodesk	 Microsoft Excel
 Azorus	 Microsoft Lists
 Azure Devops	 Microsoft Outlook
	 Microsoft Powerpoint

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



Python



R

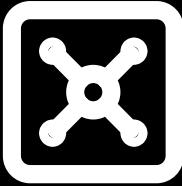
**If the original dataset is in a proprietary  
format, convert it to an open file format.**

e.g., text file, HDF5, NetCDF

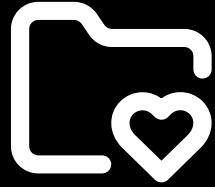
**Do you need to use proprietary tools?**

**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

Main Goal

To share



Access



By default

## Archival Package

To demonstrate integrity



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

**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

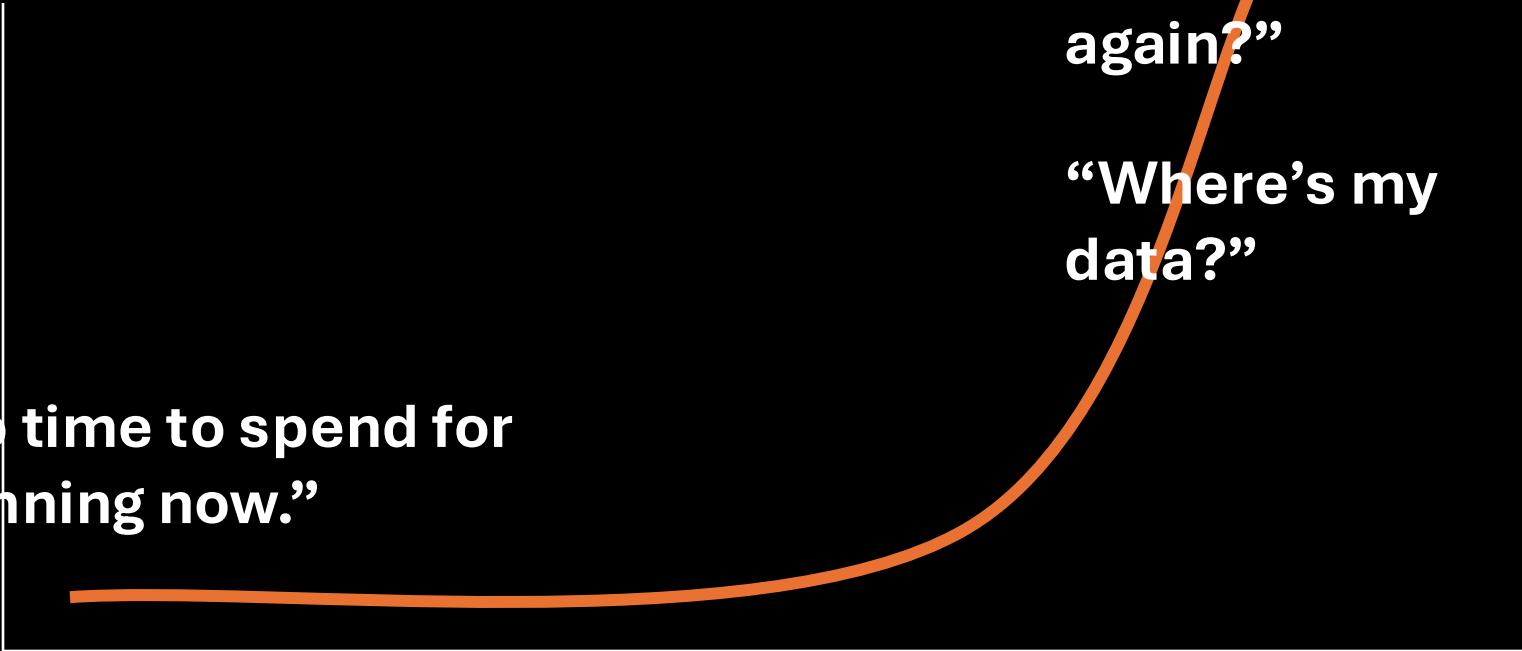
**“No time to spend for  
planning now.”**

Project Start

**“What did I do  
again?”**

**“Where’s my  
data?”**

Project End

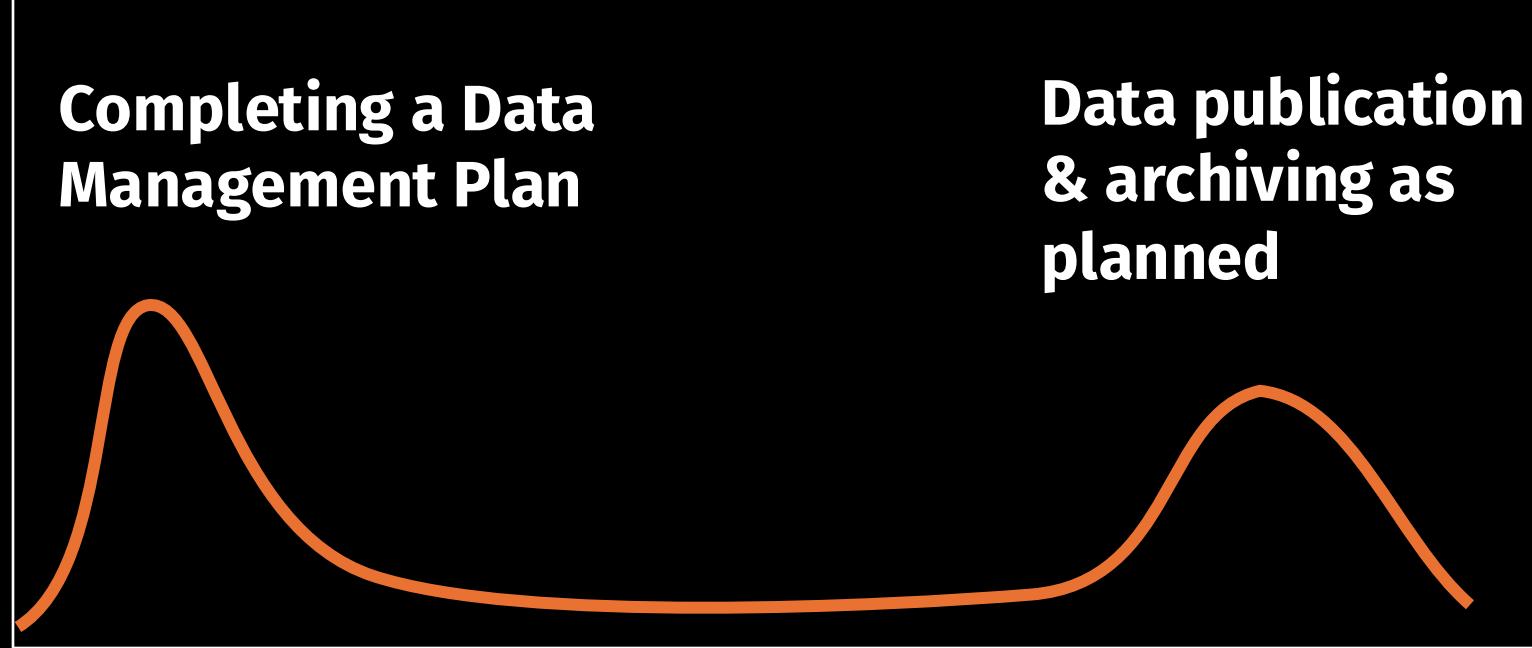


**Ideal:**  
**Start with the end in mind**

Effort

**Completing a Data Management Plan**

**Data publication & archiving as planned**



Project Start

Project End

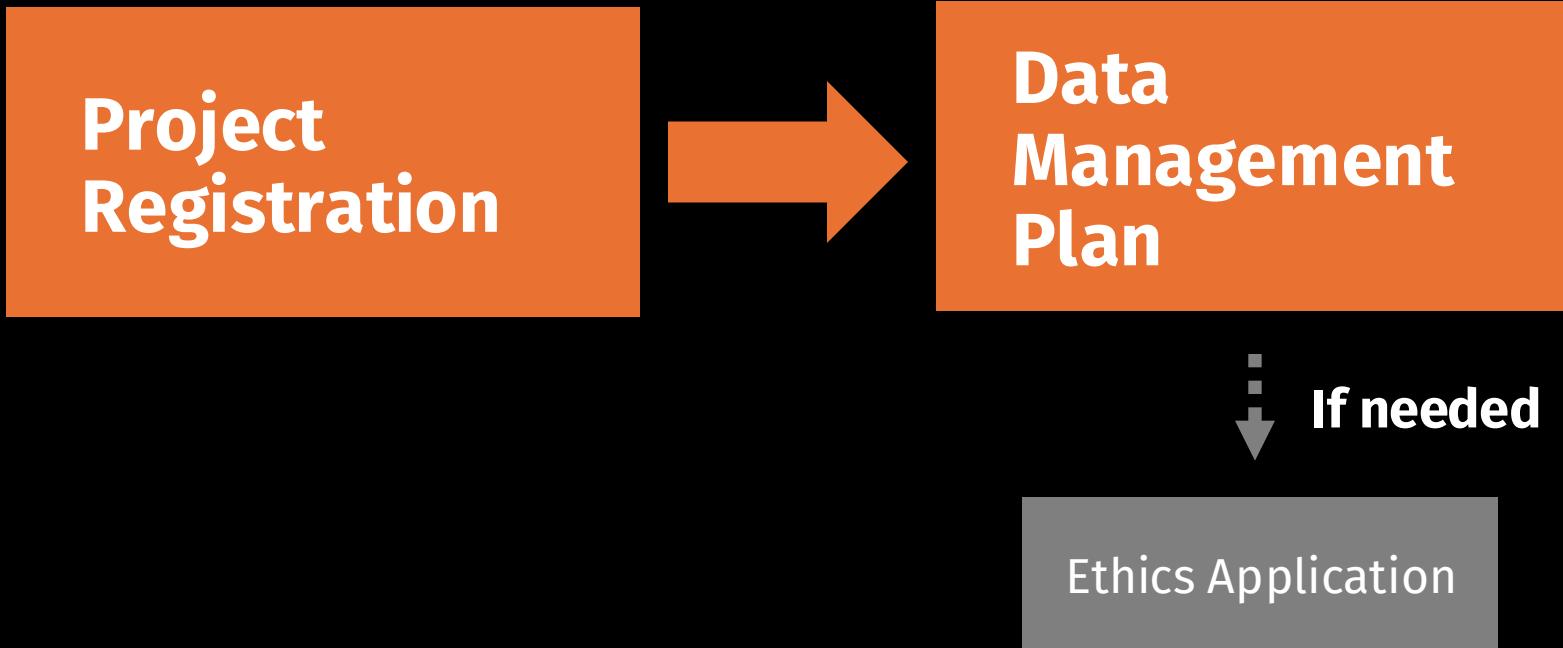
# Research Cockpit



<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.

**Department\***

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

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**  
BME, ME



**Nami Sunami**  
CE&C, APSE

**rdmsupport@tue.nl**

**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](mailto:rdmsupport@tue.nl)