Getting Started with Research Data Management Support

Kaunas 30/10/2019

Who are we?

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Data Steward

TU Delft

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Open Science & RDM Fellow

Politecnico di Torino

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Data Stewardship Coordinator

TU Delft

Who are you?

Go to

www.menti.com

Use the code:

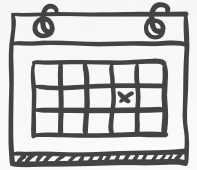
56 72 63

Aims of today's workshop

Aims of today's workshop

- Discuss the key elements of RDM support
- Provide concrete case studies on what can be done and tactics for researcher engagement
- Discover tools and resources which can be used/adapted
- Start discussions and collaborations

Agenda for today



- 10.00 - 10.15: Introduction
- 10.15 - 11.30: Getting started with RDM support
- *11.30 - 12.00: Coffee break and snacks*
- 12.00 - 13.15: How to engage with researchers?
- 13.15 - 13.30: Summary

This workshop is for you - make it yours

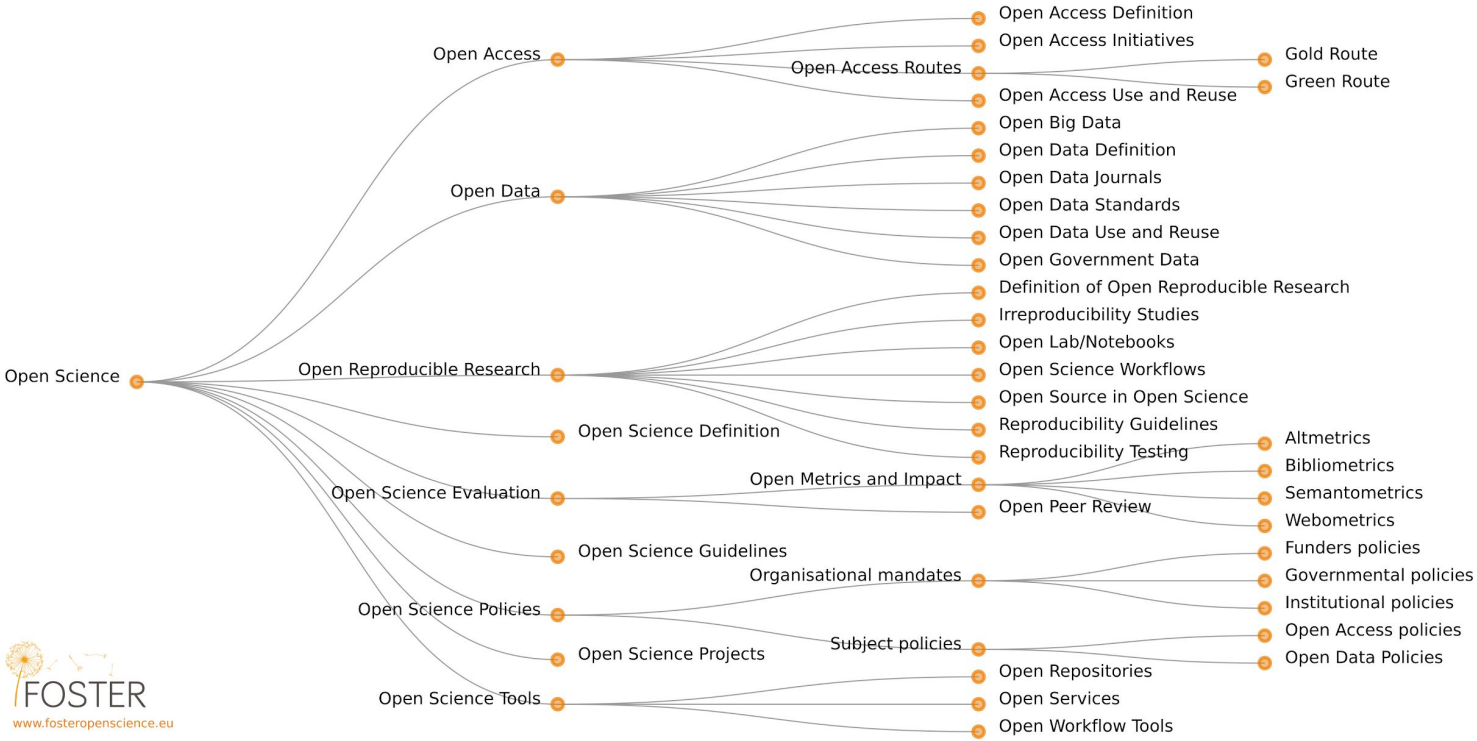
- Ask any questions you might have at any time
- Add your suggestions / solutions - we learn from each other
- We co-create this workshop

Setting the context

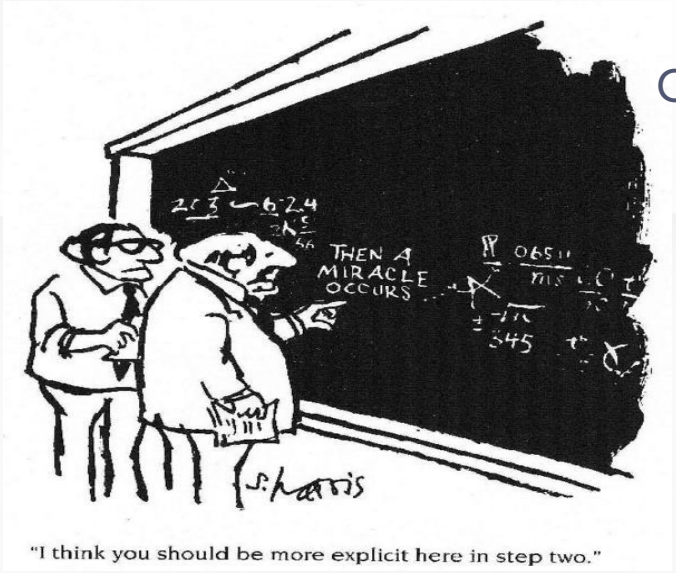
Why Open Science and RDM

What comes to your mind when you hear the term ‘Open Science’?

Open Science Taxonomy



Science ≠ Miracles



"I think you should be more explicit here in step two."

10.5281/zenodo.3472587

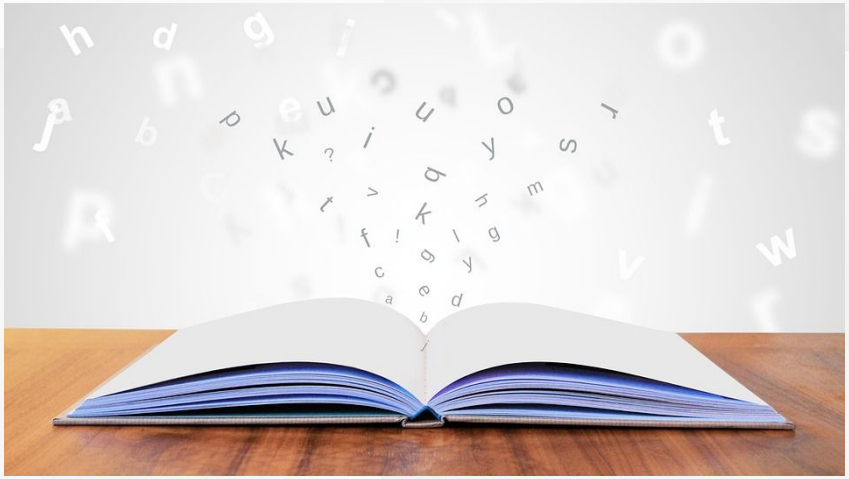
Open Science means:

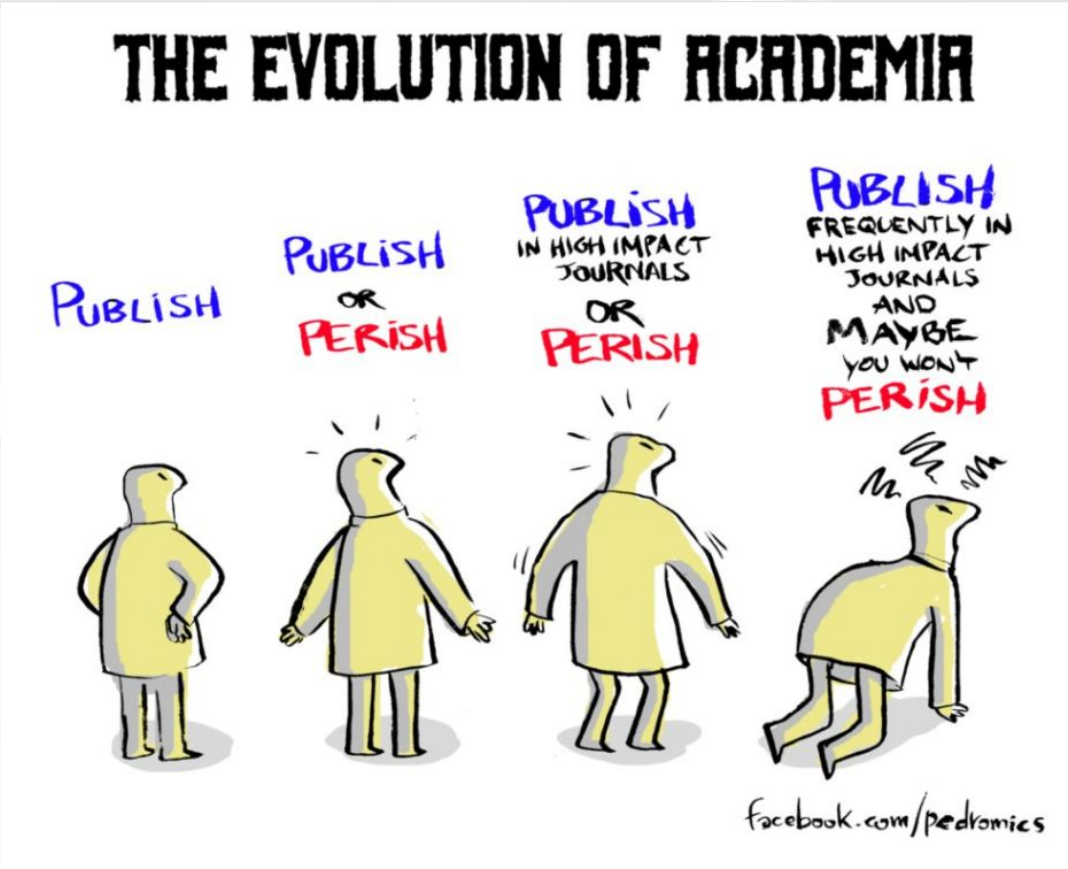
- Evidence based results,
- Transparency, reproducibility, research rigour,
- Validation and verification
- And all other things that basically define science.

https://zenodo.org/record/1285575

If Open Science is science done right..

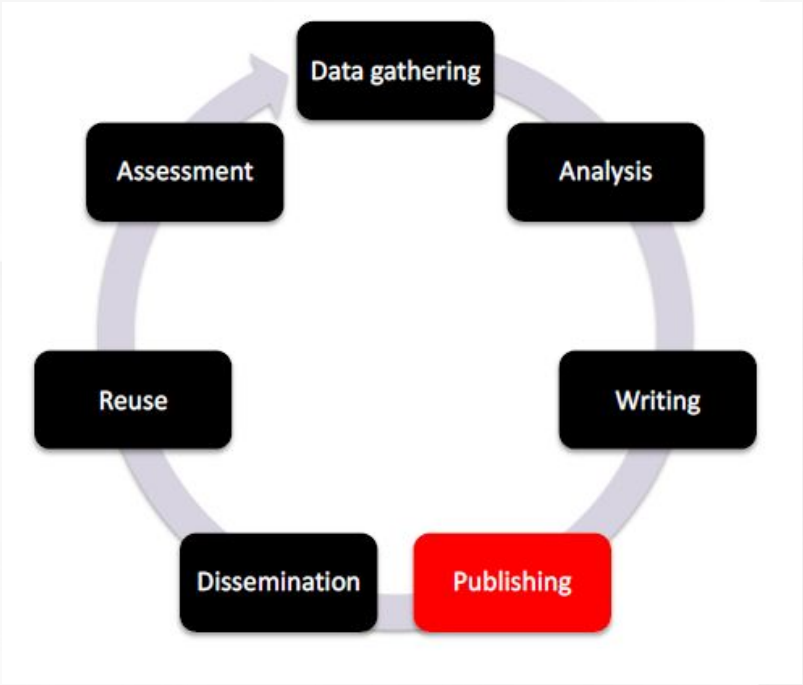
Why is everyone talking about RDM and Open Science now





Copyright:
https://velica.deviantart.com/art/Publish-or-Perish-645355248

How did we get here?



The only thing that counts in academia is publication of novel results in high impact journals

https://www.repository.cam.ac.uk/handle/1810/276106

Pressure to publish positive results...

- Design the study
- Collect data
- Analyze data as prespecified
- Oops! P> 0.05?
- Torture data until it confesses
- Then, and only then… write the manuscript

Adapted from:
Turner, Erick (2016):
https://doi.org/10.6084/m9.figshare.3381379.v1 c

Some consequences

Report finds massive fraud at Dutch universities

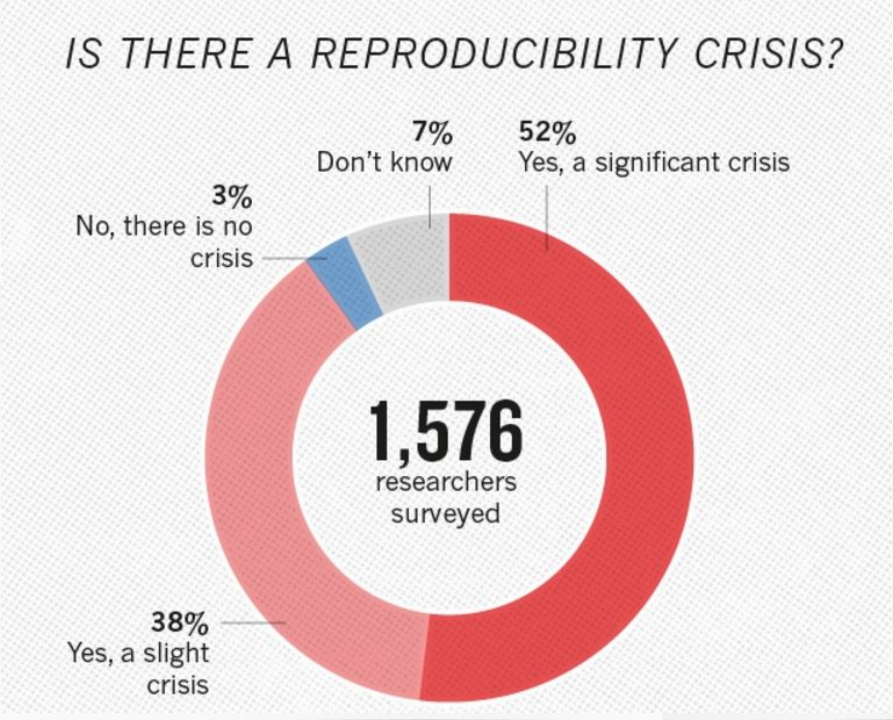
Investigation claims dozens of social-psychology papers contain faked data.

Ewen Callaway

When colleagues called the work of Dutch psychologist Diederik Stapel too good to be true, they meant it as a compliment. But a preliminary investigative report (go.nature.com/tqmp5c) released on 31 October gives literal meaning to the phrase, detailing years of data manipulation and blatant fabrication by the prominent Tilburg University researcher.

It’s not all about fraud, but mainly sloppy science

The reproducibility crisis



https://www.nature.com/news/1-500-scientists-lift-the-lid-on-reproducibility-1.19970

The main reasons for the crisis:

- Selective reporting
- Pressure to publish
- Insufficient supervision and training
- **Supporting data / methods / code not available**

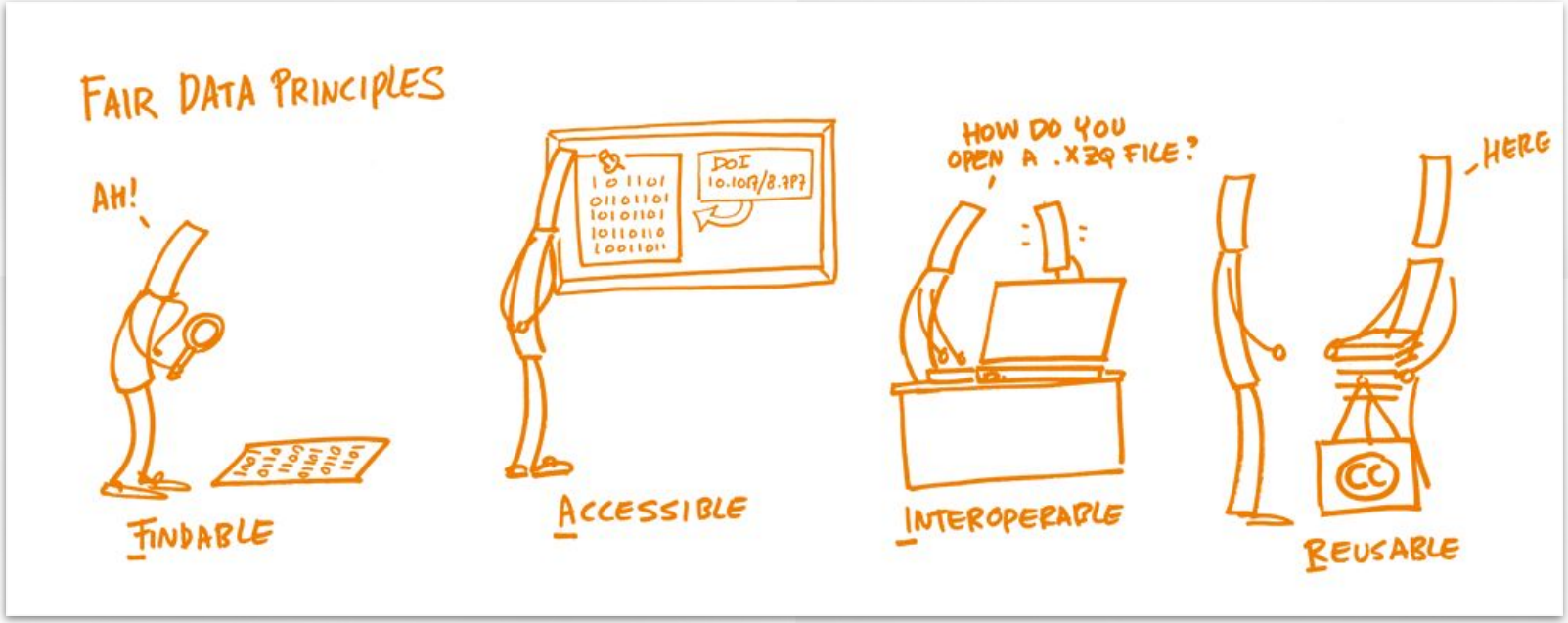
Baker, M. (2016). 1,500 scientists lift the lid on reproducibility. Nature, [online] 533(7604), pp.452-454. Available at: https://www.nature.com/news/1-500-scientists-lift-the-lid-on-reproducibility-1.19970 [Accessed 26 Apr. 2018].

Funding bodies are pushing for open science, FAIR data

https://www.ukri.org/funding/information-for-award-holders/data-policy/common-principles-on-data-policy/

More will follow!

What is FAIR?



Hochstenbach, P. (2018). *Open Research Data Material - FAIR data principles*. [image] Available at: https://hochstenbach.wordpress.com/ [Accessed 26 Apr. 2018].

Research Data Management is key!

We cannot achieve open science or FAIR data without RDM.

It is not simple but crucial!

Solutions at the intersection of technology, culture and awareness and policy

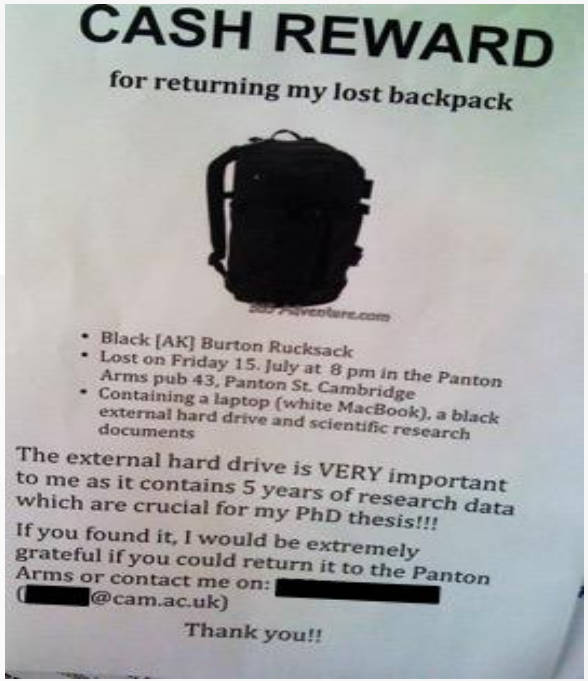
Overview of the RDM essentials in everyday research

Backup, Storage, File naming and organisation

What is your reaction if..

- Your laptop got stolen
- You lost your USB stick
- Your portable hard drive got damaged
- Your stuff on Dropbox / Google Drive disappeared

These things happen



These things happen

Visiting Professor Robbed At Gunpoint, Years Of Research Data Stolen -

Visiting Professor Robbed At Gunpoint In Davis, Years Of Research ...

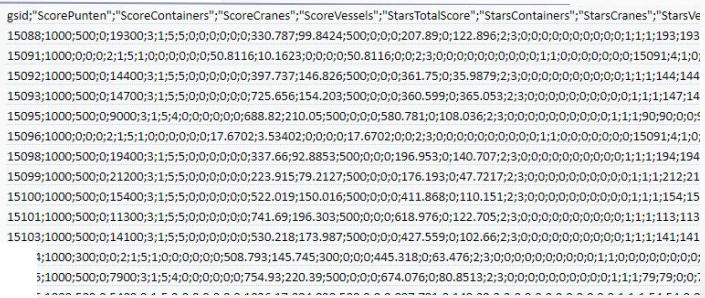
The search is on for the suspects who robbed a UC Davis professor at gunpoint - and now years of valuable scientific research data have been s...

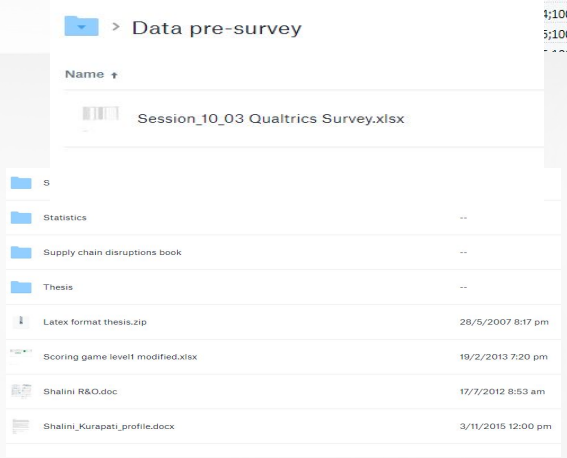
sacramento.cbslocal.com

https://sacramento.cbslocal.com/2019/09/26/uc-davis-visiting-professor-robbed-gunpoint-research-stolen/

My own experience

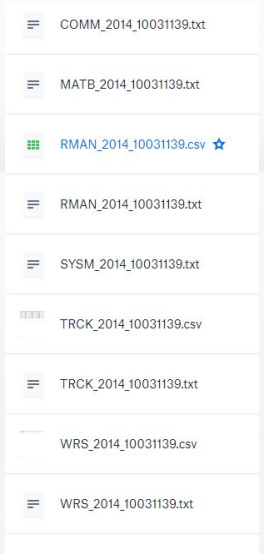
Game data: Online, no local storage, sometimes data loss due to network issues, servers in NL, sessions in US, DE and NL



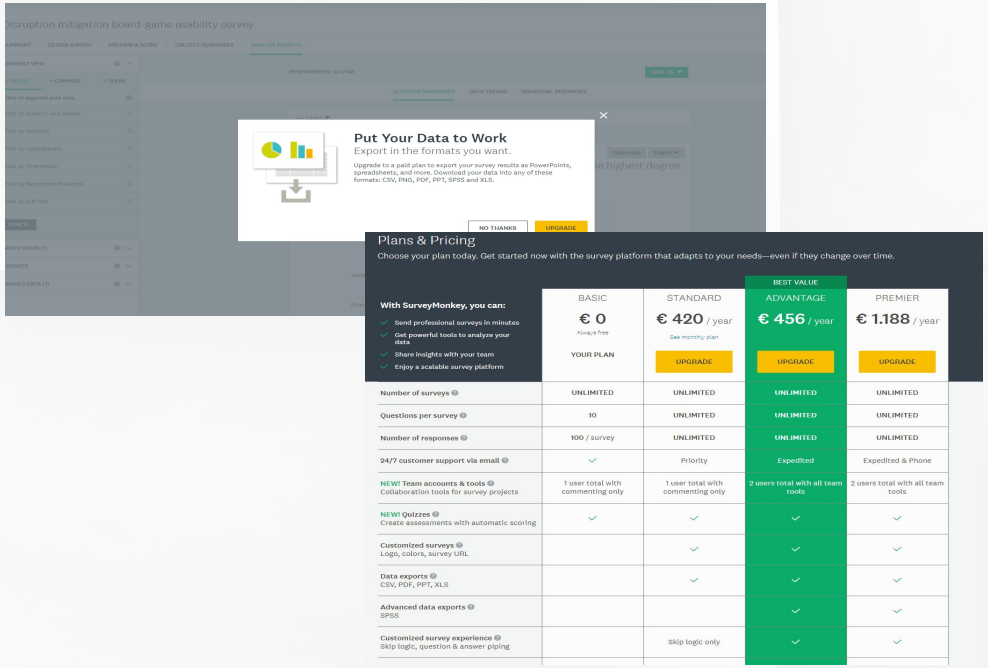


Local drivesPost-game survey embedded in the game platform, limited access

MATB data local: collected on pendrive, sometimes computer crashed, data loss



My own experience



Used survey monkey in 2012. They changed policy for exporting my own data!

Don't leave it to Google!

Google services Terms of Use:

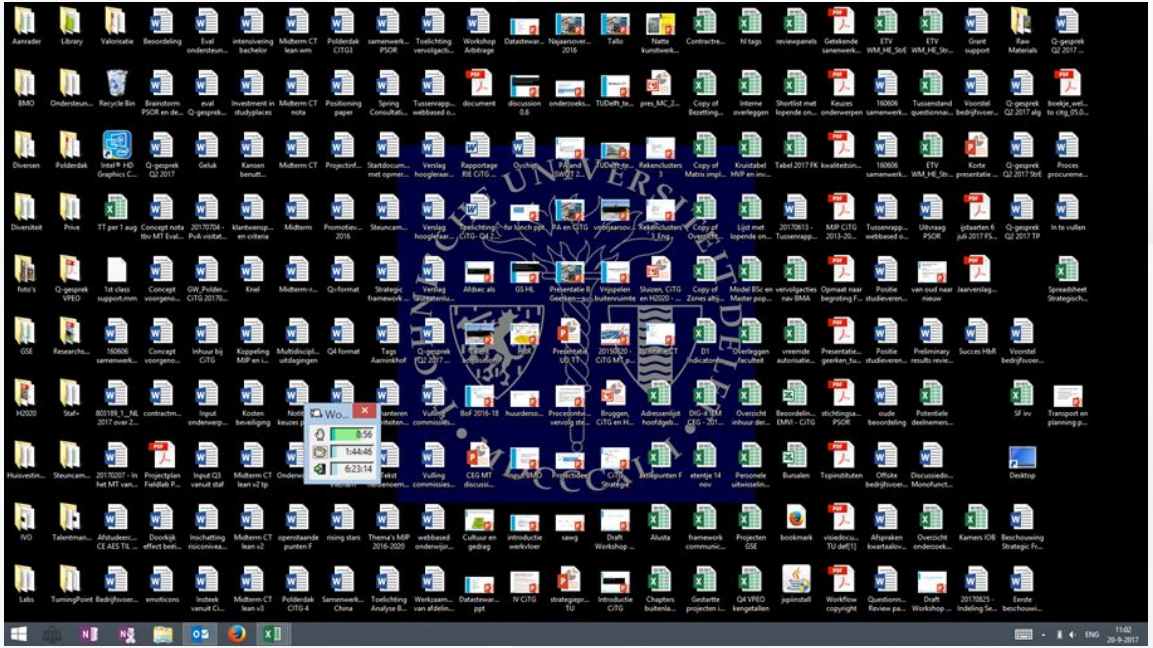
When you upload, submit, store, send or receive content to or through our Services, you give Google (and those we work with) a worldwide license to use, host, store, reproduce, modify, create derivative works (such as those resulting from translations, adaptations or other changes we make so that your content works better with our Services), communicate, publish, publicly perform, publicly display and distribute such content. The rights you grant in this license are for the limited purpose of operating, promoting, and improving our Services, and to develop new ones. This license continues even if you stop using our Services (for example, for a business listing you have added to

https://policies.google.com/terms?hl=en

And this..

Copyright:
http://10pm.com/

Recognise this?



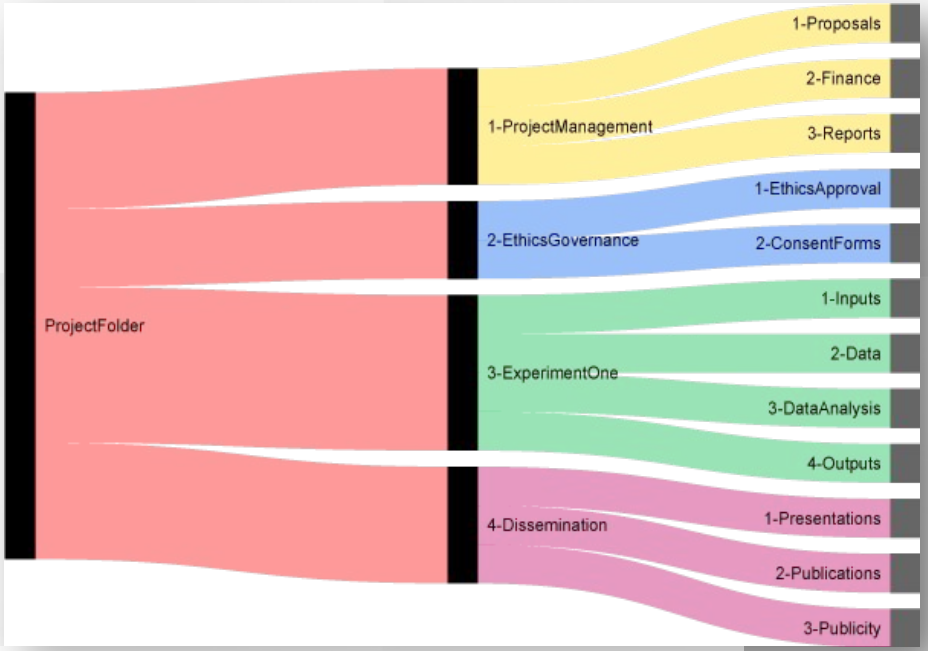
And this..

In three years would you recognise these?

Data organisation: Tips

- Consistent
- Meaningful to you and your colleagues
- Think about the continuity of your research
- Would you be able to easily find your own data files?
- Would your colleague be able to easily find and understand your data files?
- Critically look at your files (and clean them if needed!) once a week

Folder organisation

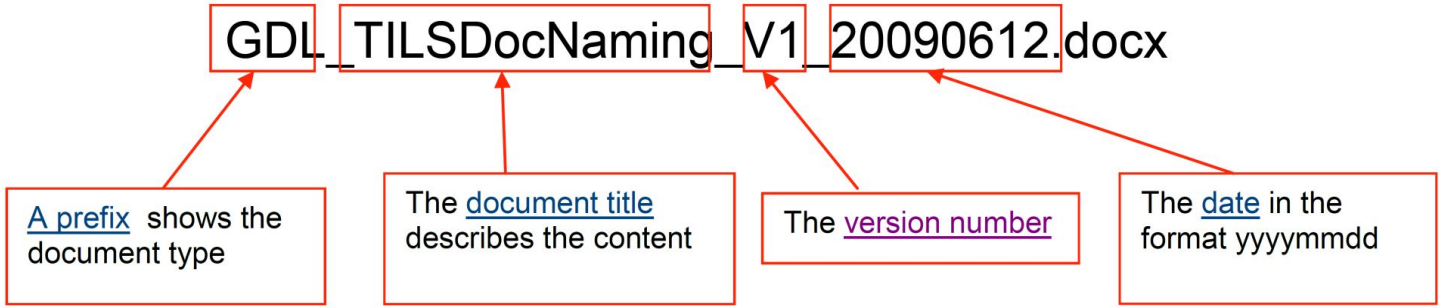


Copyright: http://nikola.me/folder_structure.html

File naming: Human and machine friendly

TILS Document Naming Convention

Document naming for the TILS Division should follow this convention:



http://www.data.cam.ac.uk/files/gdl_tilsdocnaming_v1_20090612.pdf

Putting this into practise with a dedicated tool

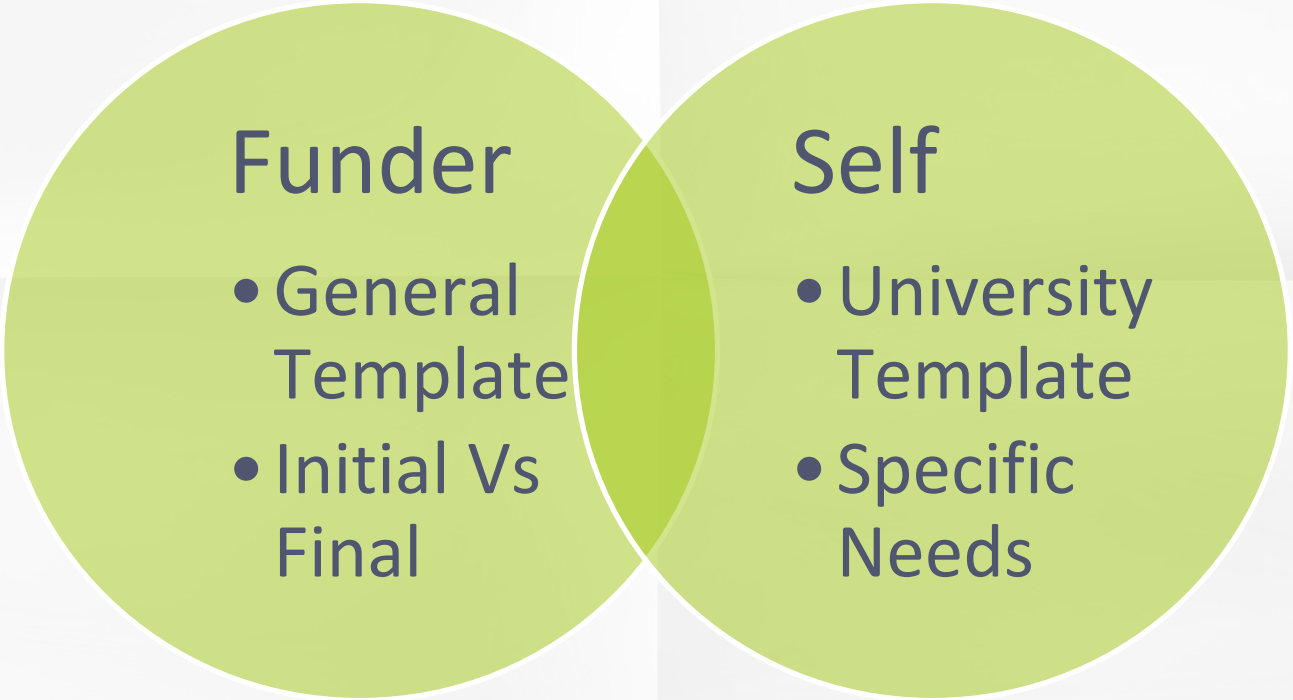
Data Management Plans

Data Management Plans

Data Management Plan - During Research

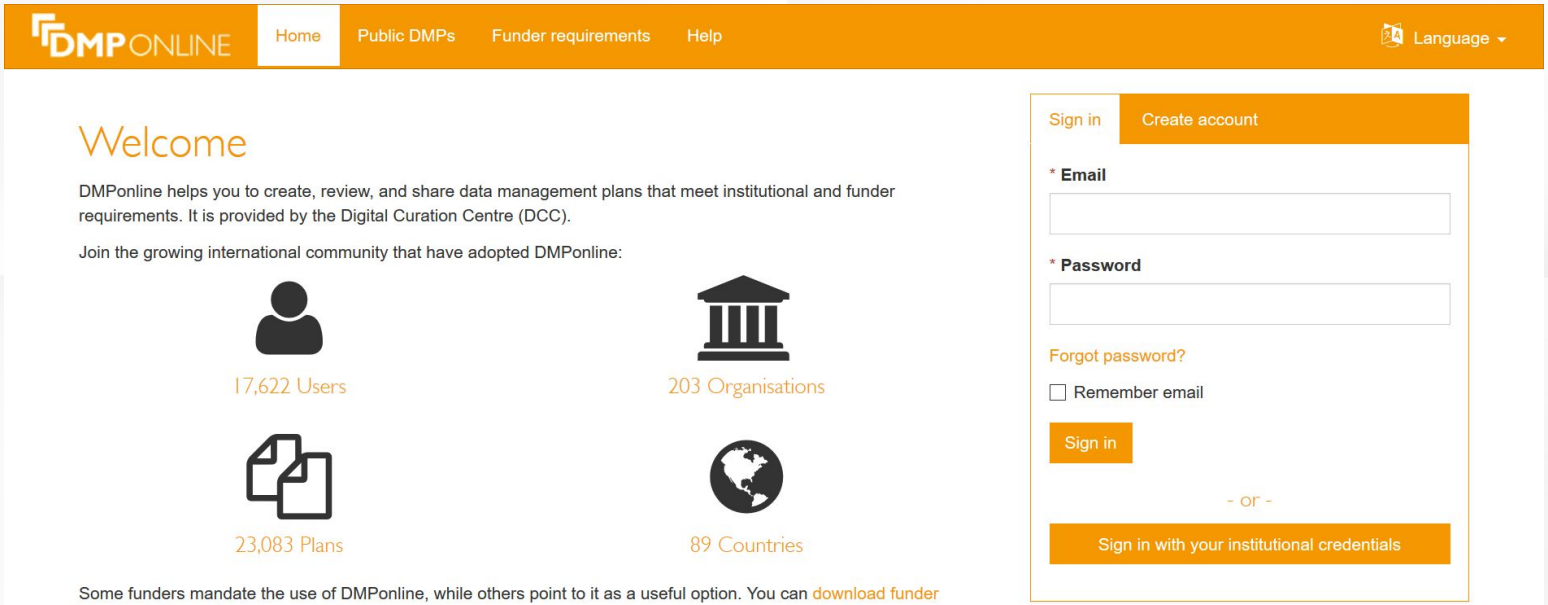
Data Management Plan - After Research

How to for DMPs



Creating a Plan:
Go to dmponline.dcc.ac.uk

Login Page


DMPONLINE
Home
Public DMPs
Funder requirements
Help
Language
Welcome
DMPonline helps you to create, review, and share data management plans that meet institutional and funder requirements. It is provided by the Digital Curation Centre (DCC).
Join the growing international community that have adopted DMPonline:
17,622 Users
203 Organisations
23,083 Plans
89 Countries
Some funders mandate the use of DMPonline, while others point to it as a useful option. You can download funder templates without logging in, but the tool provides tailored guidance and example answers from the DCC and many research organisations. Why not sign up for an account and try it out?
Sign in
Create account
* Email
* Password
Forgot password?
Remember email
Sign in
- or -
Sign in with your institutional credentials

Creating the Plan

Create a new plan

Before you get started, we need some information about your research project to set you up with the best DMP template for your needs.

* What research project are you planning?

☑ mock project for testing, practice, or educational purposes

* Select your research organisation

Delft University of Technology

- or -

☐ No research organisation associated with this plan or my research organisation is not listed

* Select the primary funding organisation

Begin typing to see a filtered list

- or -

☑ No funder associated with this plan or my funder is not listed

Create plan | Cancel

DMPs

- Great as a planning and tracking tool for RDM
- Funders expect it
- Use dmponline as a resource with excellent guidelines and exportable DMPs

Time for a break!

11.30 - 12.00

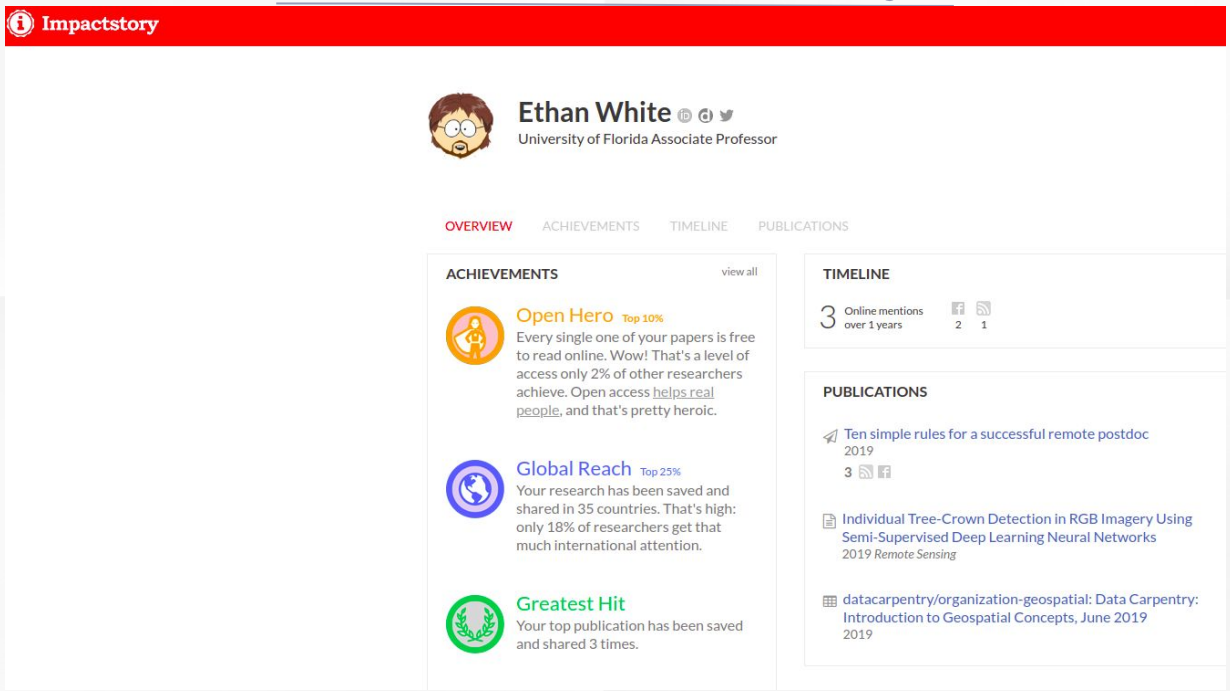
Open Science: What's in for me, selfish benefits for researchers

We all know Open Science is good for the society

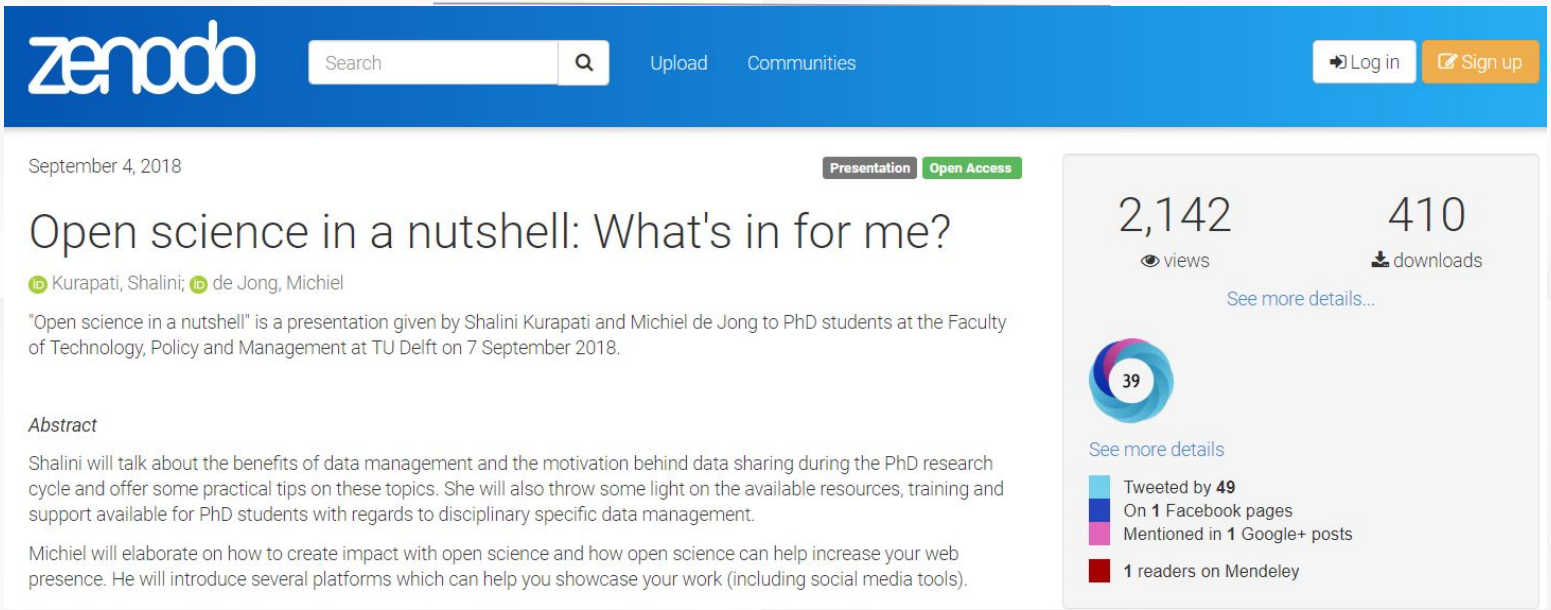
Increasing Impact

Who looks into your data set? Google does!

Use Orcid to your advantage



Publish your presentations



https://doi.org/10.5281/zenodo.1409027

Publish your data in a certified repository

https://doi.org/10.4121/uuid:9e1752fd-cce7-408e-a02c-16d1f663ec5f

Track the impact

Behavioral self-organization underlies the resilience of a coastal ecosystem

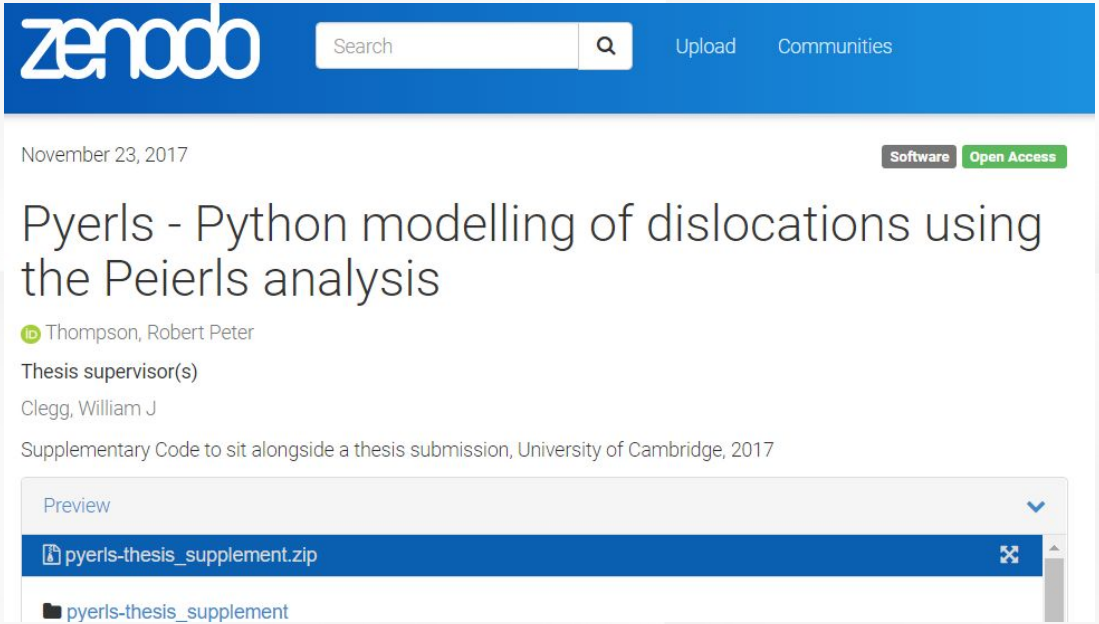
H de Paoli, T van der Heide... - Proceedings of the ..., 2017 - National Acad Sciences

Abstract Self-organized spatial patterns occur in many terrestrial, aquatic, and marine ecosystems. Theoretical models and observational studies suggest self-organization, the formation of patterns due to ecological interactions, is critical for enhanced ecosystem resilience. However, experimental tests of this cross-ecosystem theory are lacking. In this study, we experimentally test the hypothesis that self-organized pattern formation ...

Cited by 2 All 6 versions Web of Science: 1 Cite Save

Create alert

Publish your code



https://doi.org/10.5281/zenodo.1065538

understanding RDM costs

You can find many many free and certified repositories upto a certain data size: Zenodo, 4TU centre for research data etc.

If you need to understand/advise on how to budget for RDM costs in general:

4TU RDM Costing Tool

Zingtree

What's Zingtree?

Data Management Costing Tool

Data Management costing tool

4TU. CENTRE FOR RESEARCH DATA TU Delft

Welcome to the Data Management Costing Tool. This is for TU Delft researchers and staff to help determine costs and staffing requirements in project proposals. Let's start with some questions about your project which will help us estimate the data management needs of your project.

bit.ly/RDM costing

OpenAire RDM costing tool

OpenAIRE

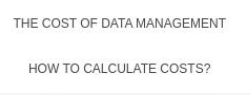
EXPLORE PRO

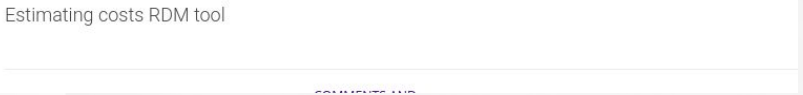
SERVICES SUPPORT OPEN SCIENCE IN

Guides for Researchers

How to identify and assess Research Data Management (RDM) costs

https://www.openaire.eu/how-to-comply-to-h2020-mandates-rdm-costs





Increase your funding chances

Winning Horizon 2020 with Open Science

Grigorov, Ivo; Davidson, Joy; Donnelly, Martin; Jones, Sarah; Elbaek, Mikael

Investing in research towards solutions for Societal Challenges is a key priority of the EU Innovation Union[1], and the EC has placed focus on "Open Innovation, Open Science and Open to the World"[2] as a strategy to make the EU leader in Research & Innovation.

Open Science is about removing all barriers to full sphere basic research knowledge and outputs (research data, researc code, publications, policy briefs), and thus feeding Open Innovation and the knowledge-based economy. The concept is central to EU's Responsible Research and Innovation philosophy[3], and removing barriers to basic research measurably contributes to the EU's Blue/Green Growth Agenda[4]. Despite the potential of the internet age to deliver on that promise only 50% of today's basic research is freely available[5].

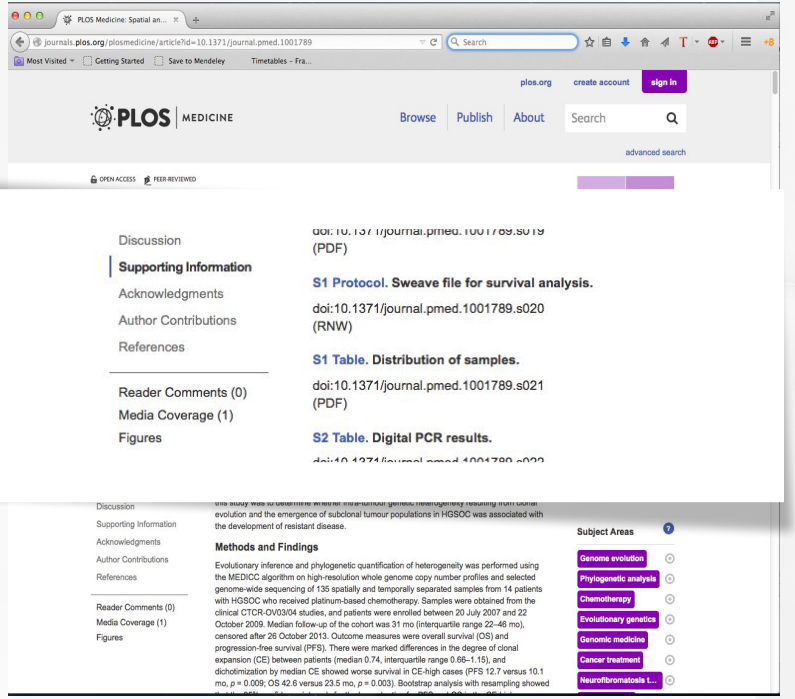
The workshop will demonstrate how and why Open Science can be a key tool for research managers formulating and managing grant proposals.

Learning Outcomes follow FP7 FOSTER Open Science Learning Objectives (http://dx.doi.org/10.5281/zenodo.15603) :

- Understand EC's Open Science Agenda priorities;
- Gain insight into what is, and will be, mandated on access to research, and data management;
- Be capable to integrate Open Science in the research concept, and its impact;
- Understand Open Science's impact on EC Evaluation process based on examples from 2014-2015.

https://zenodo.org/record/46602#.XbCnKegzZPY

Helps you while writing papers

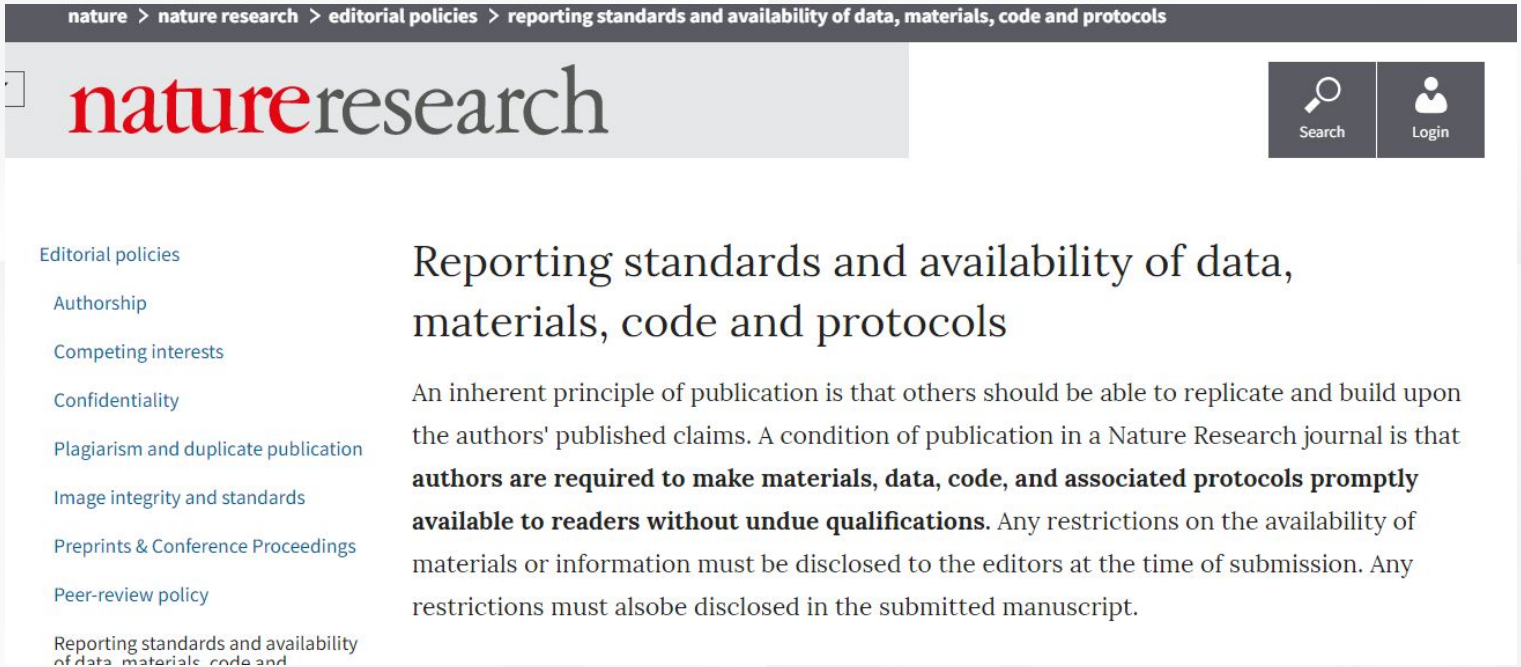


Capture all the complexity of your research beyond just text and pdf

But.. what about my career

Things are changing.. slowly but surely!

The 'reputed' journals need it already!



nature > nature research > editorial policies > reporting standards and availability of data, materials, code and protocols

nature research

Search Login

Editorial policies

- Authorship
- Competing interests
- Confidentiality
- Plagiarism and duplicate publication
- Image integrity and standards
- Preprints & Conference Proceedings
- Peer-review policy
- Reporting standards and availability of data, materials, code and

Reporting standards and availability of data, materials, code and protocols

An inherent principle of publication is that others should be able to replicate and build upon the authors' published claims. A condition of publication in a Nature Research journal is that **authors are required to make materials, data, code, and associated protocols promptly available to readers without undue qualifications.** Any restrictions on the availability of materials or information must be disclosed to the editors at the time of submission. Any restrictions must alsobe disclosed in the submitted manuscript.

Decision makers are pushing for change

Evaluation of Research Careers fully acknowledging Open Science Practices

Rewards, incentives and/or recognition for researchers practicing Open Science

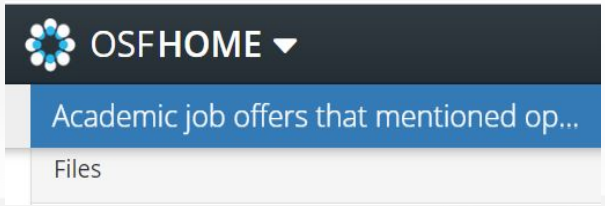
https://cdn1.euraxess.org/sites/default/files/policy_library/os-rewards-wgreport-final_integrated_0.pdf

Funders might prefer those who practise Open Science..

soon

Open Science Career Assessment Matrix (OS-CAM)	
Open Science activities	*Possible evaluation criteria*
RESEARCH OUTPUT	
Research activity	Pushing forward the boundaries of open science as a research topic
Publications	Publishing in open access journals Self-archiving in open access repositories
Datasets and research results	Using the FAIR data principles Adopting quality standards in open data management and open datasets Making use of open data from other researchers
Open source	Using open source software and other open tools Developing new software and tools that are open to other users
Funding	Securing funding for open science activities

There's a whole collection of academic jobs mentioning OS



https://osf.io/7jbnt/

Name	Modified
Academic job offers that mentioned open sci...	
OSF Storage (United States)	
180911_OTTT_Sensory_Sciences_deuts...	2019-03-01 08:24 AM
180911_OTTT_Sensory_Sciences_englis...	2019-03-01 08:24 AM
2019_HH-Uni_W2-3_Sportpsychologie.p...	2019-05-21 08:26 AM
Aachen_W3_Prof_Angewandte_comput...	2019-04-10 11:52 AM
AllgemeinePsychologieUHH.pdf	2018-10-12 08:51 AM
Announcement_W3_Professur_SocialPs...	2018-01-18 02:25 PM
Bielefeld_Psychologie_Sportwiss_W2_P...	2019-04-23 11:53 AM
Charite_Berlin.png	2018-03-10 09:08 AM
Dresden_WiMi.pdf	2018-07-13 12:37 PM
Keele_Lecturer_2018.pdf	2018-07-11 01:14 PM
Leipzig-W2_Professorship_in_Psycholog...	2019-05-17 06:11 AM

There is no looking back really

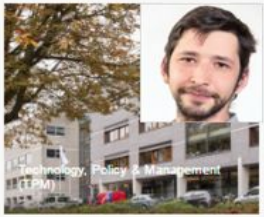
Comic by https://thenorwichradical.com/2017/01/12/post-truth-politics-and-the-war-onintellect/

Open Science is the only way forward in the post truth world

TU Delft Data Stewardship Team

Coordinator located at the library
A dedicated Data Steward at every faculty:
all have a PhD (or equivalent)

https://www.tudelft.nl/library/datastewardship/



What do the Data Stewards do?

Personal approach:

- They are there for any data questions
- Help researchers who “don’t have data” and who “don’t have problems”
- Places: coffee machine, canteen, lift, doorway…
- Every occasion is good!

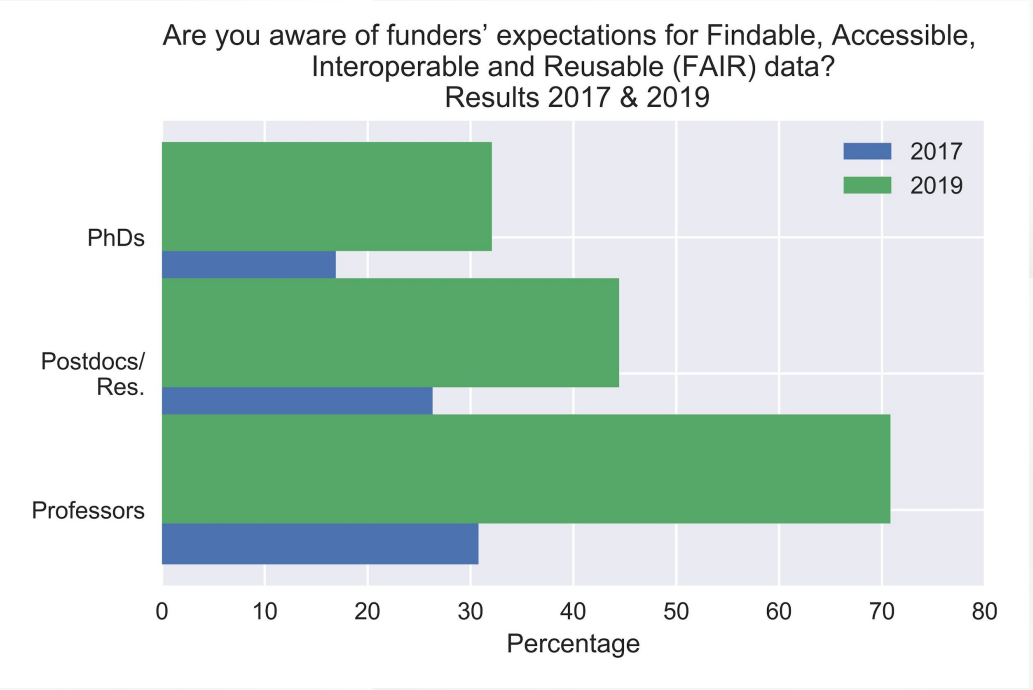
Change happens one person at a time

Objective: Improve daily practice not enforcement

Does it make a difference to have a Data Steward?

Heather Andrews

Heather Andrews, Data Steward at Faculty of Aerospace Engineering, TU Delft



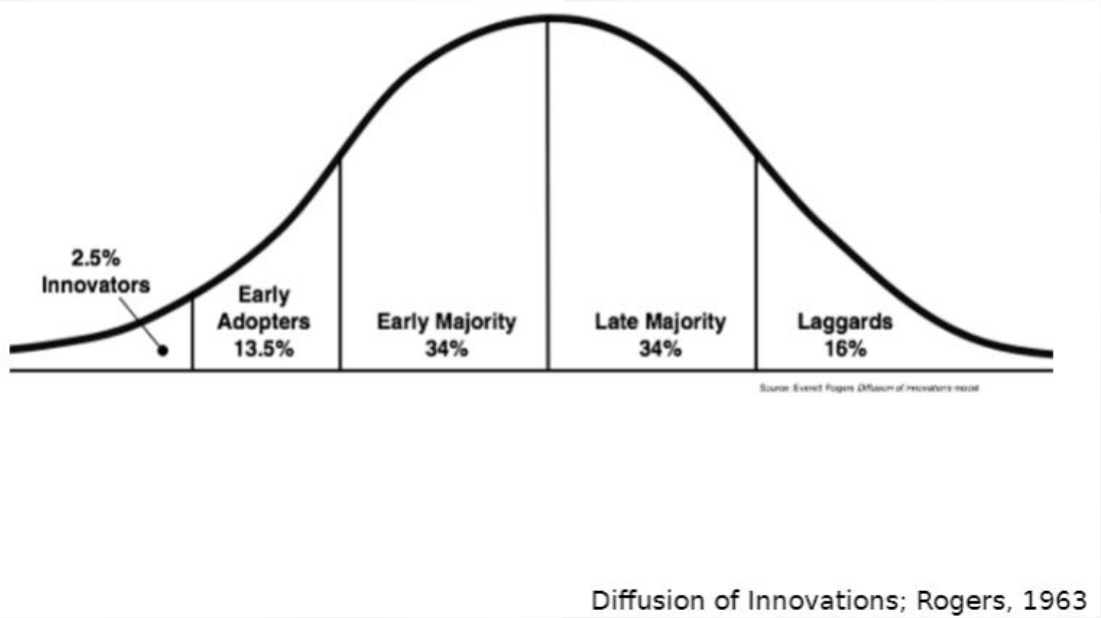
"Change happens one person at a time"

Jonathan Petters,
Virginia Tech

"To a large extent, researchers are not interested in data management planning. Apart from the fact that they have to do it for grant proposals, they're generally not interested in sharing data. They want their problems to be solved (...) So our aim (...) is to help researchers where they want help. While helping them we have the opportunity to talk to them about data management planning and data sharing"

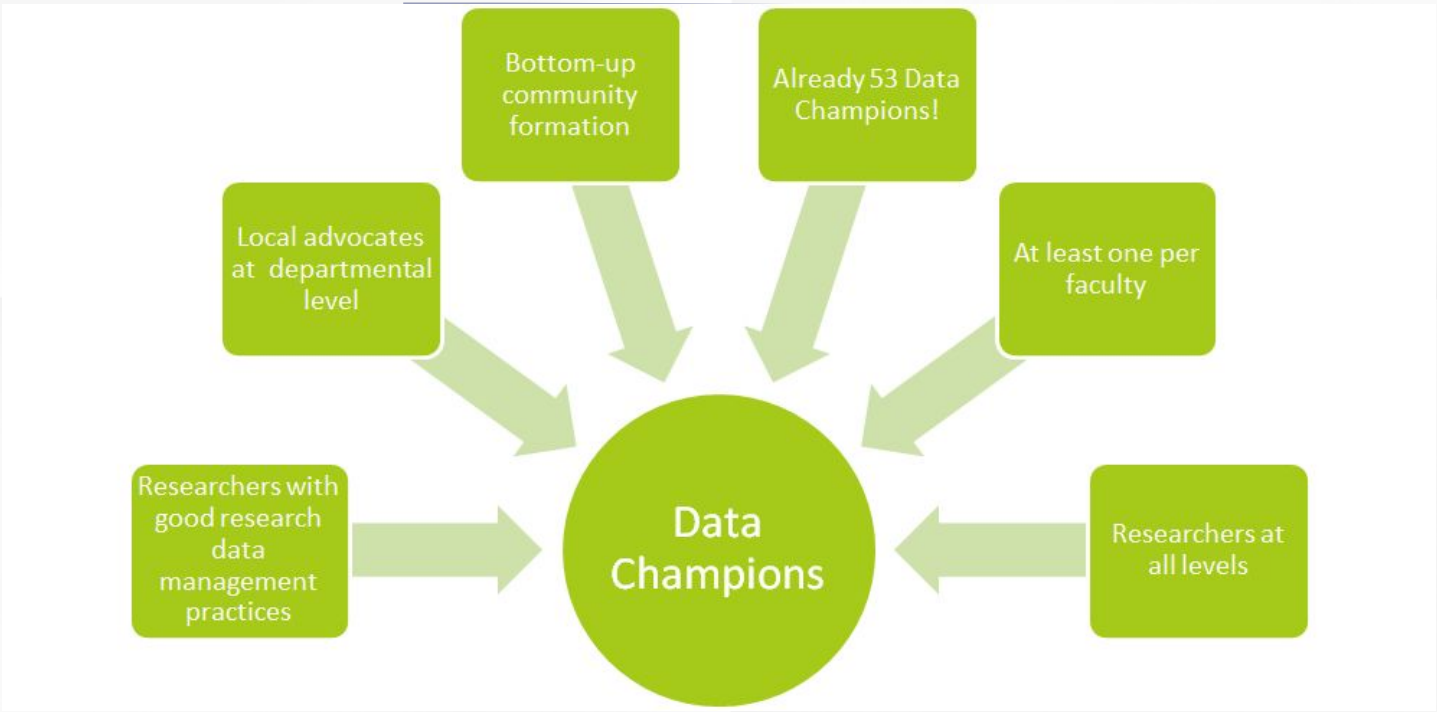
Engaging Researchers with Data Management: The Cookbook,
DOI: 10.11647/OBP.0185

Small incremental (realistic!) steps can make a big difference



Diffusion of Innovations; Rogers, 1963

Data Champions



Data Champions - The Rewards

What do the Data Champions do?

Launch of TU Delft Open Hardware Community

DelftOpenHardware
Group ID: 6229781

People at TU Delft interested and working on open harware projects.

Subgroups and projects | Shared projects | Archived projects | Search by name | Last created

O	Open-source-Centrifuge-for-WetLab	★ 0	4 days ago
F	Fume Sensor for Precious Plastic Machines A project to give an indication of the amount of fumes in the air and	★ 0	4 days ago
	community-website	★ 0	3 days ago
	hardocs	★ 0	4 days ago
B	Biogas Mesothermic bio-digester for small farms	★ 0	2 days ago

https://gitlab.com/go-commons/delftopenhardware

What do the Data Champions do?

Champion the use of new tools

Keep calm and go paperless: Electronic lab notebooks can improve your research.

https://openworking.wordpress.com/2019/07/05/keep-calm-and-go-paperless-electronic-lab-notebooks-can-improve-your-research/

Data Stewardship and Data Champions

- Infrastructure is important but at the end of the day people do the research
- In person interaction with researchers is important to get their buy in
- Peer exemplars as examples is great for advocacy and motivation for the good RDM practice

Case Study from Italy

RDM and OpenScience at PoliTecnico di Torino

35 000	**Students enrolled in Bachelor's and Master's degree programmes**
565	**Students enrolled in I and II level Specializing Masters programmes** Lifelong Learning courses Training courses for businesses
684	**PhD Doctoral Candidates** | a.y. 2018/2019
72%	**Male Students**
28%	**Female Students**
68%	**Students coming from outside Piedmont** 52% Italians living outside Piedmont 16% international students
5 302	**First-year students** | a.y. 2018/2019

a.a. 2018/2019

POLITECNICO DI TORINO

PhD programme

Out of the **771** PhD candidates

SCHOLARSHIPS

85% of PhD candidates receive a scholarship (616 in total)

The PhD grant is **30%** higher than national average level (**18,855 Euros** per year gross)

25% of PhD scholarships are funded by external non-academic bodies

10 PhD programmes offered with the apprenticeship scheme

PhD PROGRAMMES DURATION

3 years

1/3 learning activity

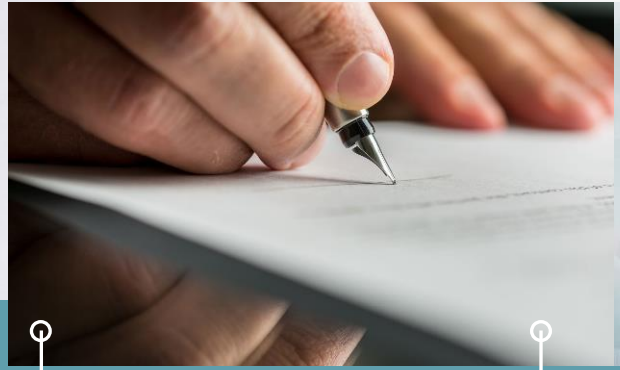
2/3 research activity

EXCELLENCE OF PhD CANDIDATES

80% of PhD candidates have a Master's degree with final grade of **105/110**

60% with **110/110**

International Research Grants



246 European and International Projects

76 Million EUR
--- since 2014

191 EU Horizon 2020 Projects

46 coordinated

70 Mio EUR | **16,55%** success rate

among which

12 ERC
European Research Council
15,5 M EUR

36 MSCA
Marie Skłodowska Curie Actions
11,5 M EUR

118 IL-SC-JTI
Industrial Leadership-Societal Challenges e Joint Technology Initiative
36 M EUR

3 EIT Communities

European Institute of Innovation &Technology

Inno Energy | EIT Digital | EIT Manufacturing

POLITECNICO DI **TO**RINO

Collaborations with Companies and Banking Foundations

FCA
FIAT CHRYSLER AUTOMOBILES

49 R&D projects

In 2014-2018

Compagnia di San Paolo

45 R&D projects

In 2016-2018

Fondazione CRT

9 R&D projects

In 2014-2017

Collaboration with big industrial partners

ThalesAlenia Space
Avio Aero A GE Aviation Business
Ferrari
FCA FIAT CHRYSLER AUTOMOBILES
GM
hp
IBM
INDESIT company
GIUGIARO
MICHELIN
Microsoft
PIRELLI
PHILIPS
SKF
pininfarina
EDISON
EDF
SIEMENS
iren mercato
TIM
GAZPROM
ROSNEFT
eni

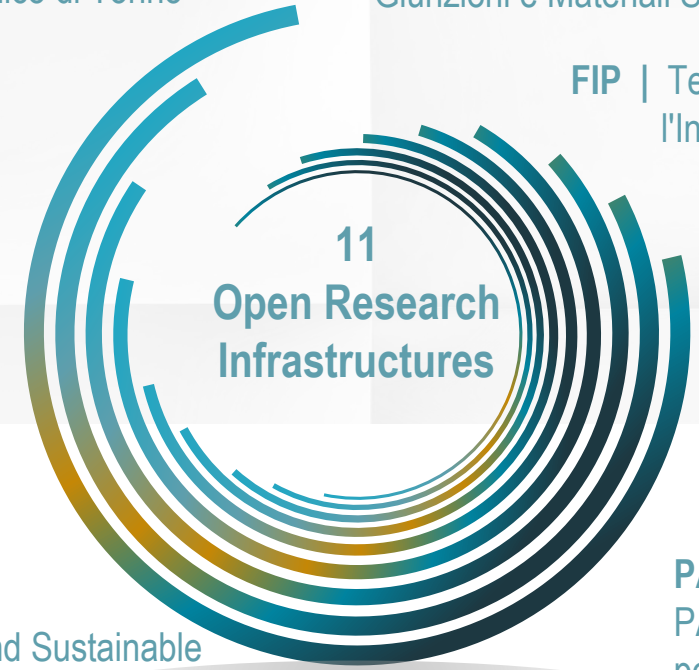
Research Infrastructures

IAM@Polito | Integrated Additive Manufacturing@Politecnico di Torino

DynLab4JMat | Laboratorio per l'Integrità Strutturale di Giunzioni e Materiali Sottoposti a Carichi Dinamici

TEST-eDrive | Nuova infrastruttura di test di e-DRIVE per applicazioni automobilistiche

FIP | Tecnologie Fotoniche per l'Industria 4.0 in Piemonte



PiqueT | Piemonte Quantum Enabling Technology

SAX | Strumentazioni avanzate per sistemi complessi

HPC4AI | Centro di Competenza Calcolo ad Alte Prestazioni e Intelligenza Artificiale Torino

CCL | CO2 Circle LAB

PAsTISs |
PArco per le Tecnologie Innovative per la Salute

CARS-HEV@PoliTo
Centre for Automotive Research and Sustainable mobility-Hybrid/Electric powertrain and Vehicle Laboratory

BRISK2 | Biofuels Research Infrastructure

POLITECNICO DI **TO**RINO

Well equipped IT infrastructure wise

- The Information Technology area provides services to research: computing and data backup needs.
- Researchers can request secure backup (for regular data) in two different locations for upto 6 months of retrieval
- Applications: Web server, database, computing power, software, and virtual infrastructure (table)

Virtual Machines	Virtual CPUs	RAM [GB]	Storage [TB]	Backup [TB]
30	98	250	11	40

Cloud Act

Some push for data sovereignty

CLOUD Act

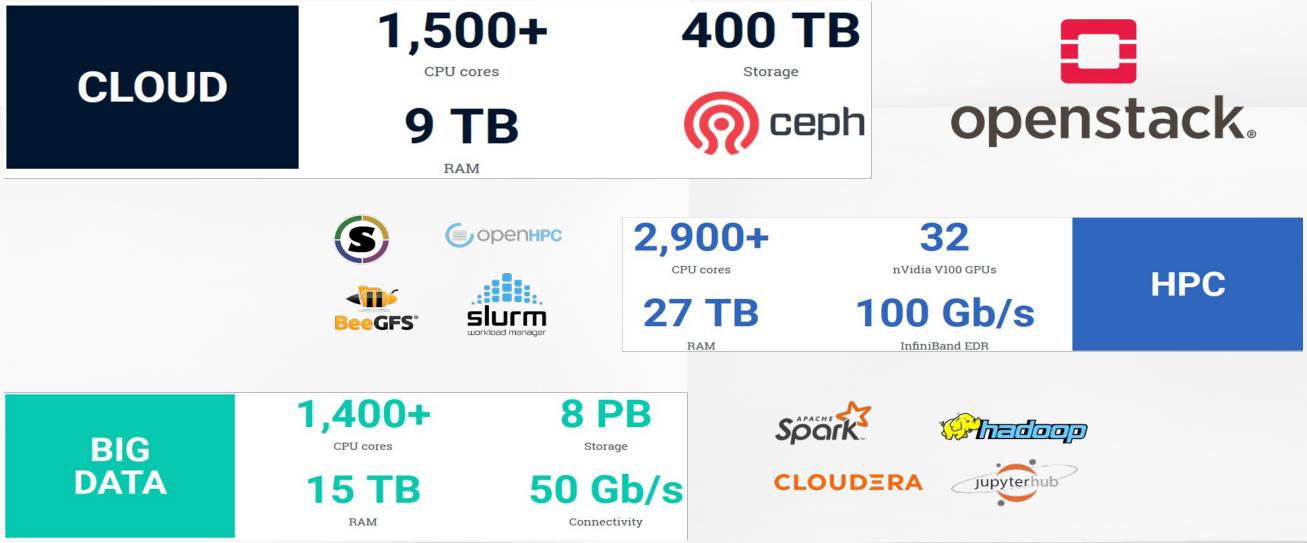
From Wikipedia, the free encyclopedia

The **Clarifying Lawful Overseas Use of Data Act** or **CLOUD Act** (H.R. 4943) is a United States federal law enacted in 2018 by the passing of the Consolidated Appropriations Act, 2018, PL 115-141, section 105 executive agreements on access to data by foreign governments. Primarily the CLOUD Act amends the Stored Communications Act (SCA) of 1986 to allow federal law enforcement to compel U.S. based technology companies via warrant or subpoena to provide requested data stored on servers regardless of whether the data are stored in the U.S. or on foreign soil.

Contents [hide]

Big data, HPC and cloud at PolTo

HPC, Private cloud and Big Data services in collaboration with SmartData@PoliTO e HPC@POLITO.



My role at PoliTo

Helping Dr. Federica Cappelluti, rector's advisor on open science on:

- Training and Awareness on OS and RDM
- Demonstrating value and driving cultural change towards open science
- Collaborating with university stakeholders
- Design of a policy roadmap
- Advice (as much as I can) on all data related matters of Open Science
- Researcher oriented

Future plans

- RDM policy development and implementation
- Training and awareness FAIR data and Data Management Plans
- Researcher engagement
- Industry collaborations and Open Science
- Data and Software Carpentries
- PhD students and graduate schools
- Long term plan: To increase support and keep it sustainable

We have the technical infrastructure, we need human capa

Engaging Researchers with Data Management: What Works?

So what works?

How to engage researchers with RDM?
All researchers?
And how to avoid THIS?
(and make them excited instead?)

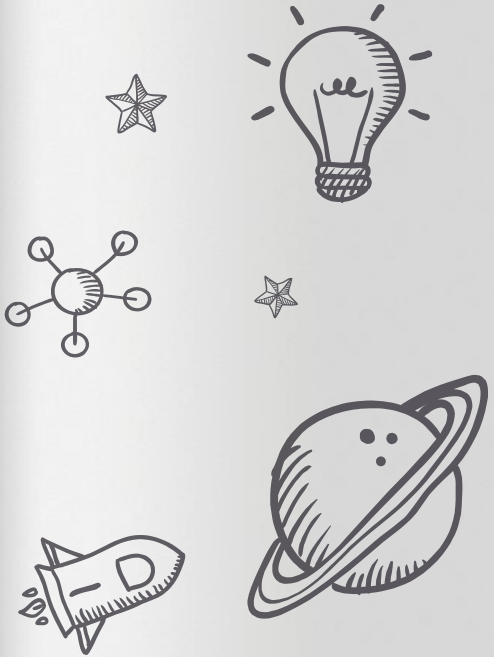
How to re-use and stop re-inventing the wheel?

Word of mouth (and conferences) help...

...but is it really the best way?

Libraries for Research Data Interest Group

https://www.rd-alliance.org/groups/libraries-research-data.html



Quest

to find innovative ways of engaging researchers with research data

&

to make these findings accessible to others

Engaging researchers with research data - project in numbers

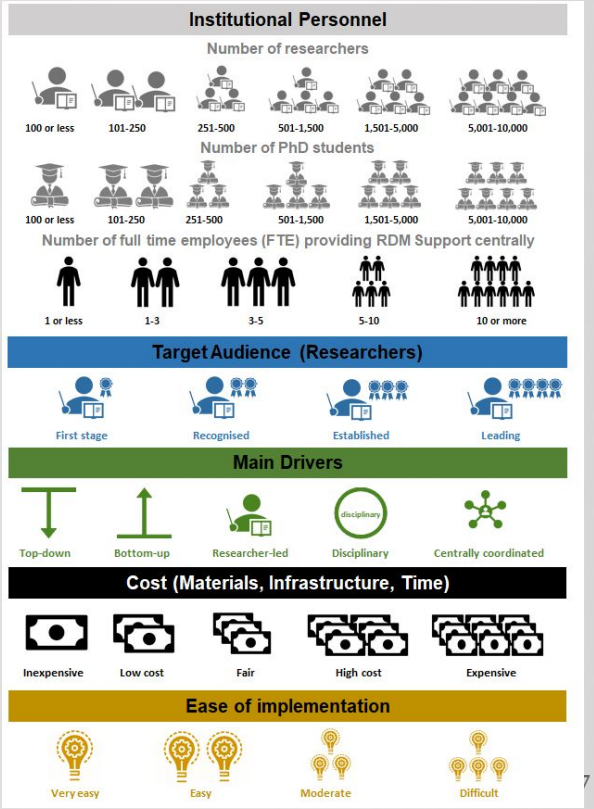
- 30 + project members from 3 continents
- Created a survey to collect case studies
- Contacted 60 funders, 80 scientific institutions, and used 28 mailing lists
- 216 responses, 88 described their activities
- 50 unique scientific institutions
- 24 cases selected for in-depth interviews and write up

Book sprint - to write up these case studies

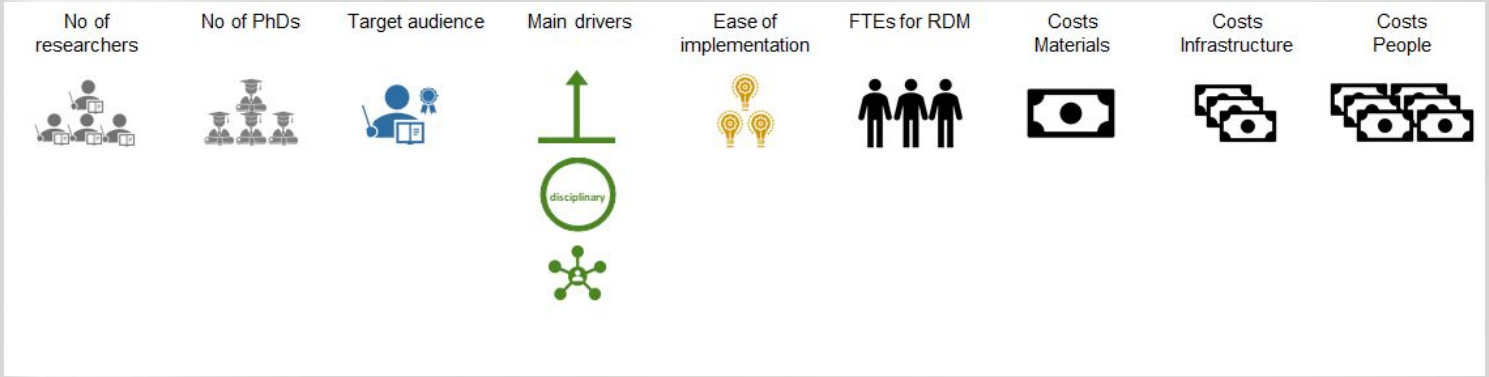
https://www.rd-alliance.org/blogs/book-sprint-success-team-writing-exercise-win.html

Like in a cookbook:

We have identified the key necessary ingredients for each recipe

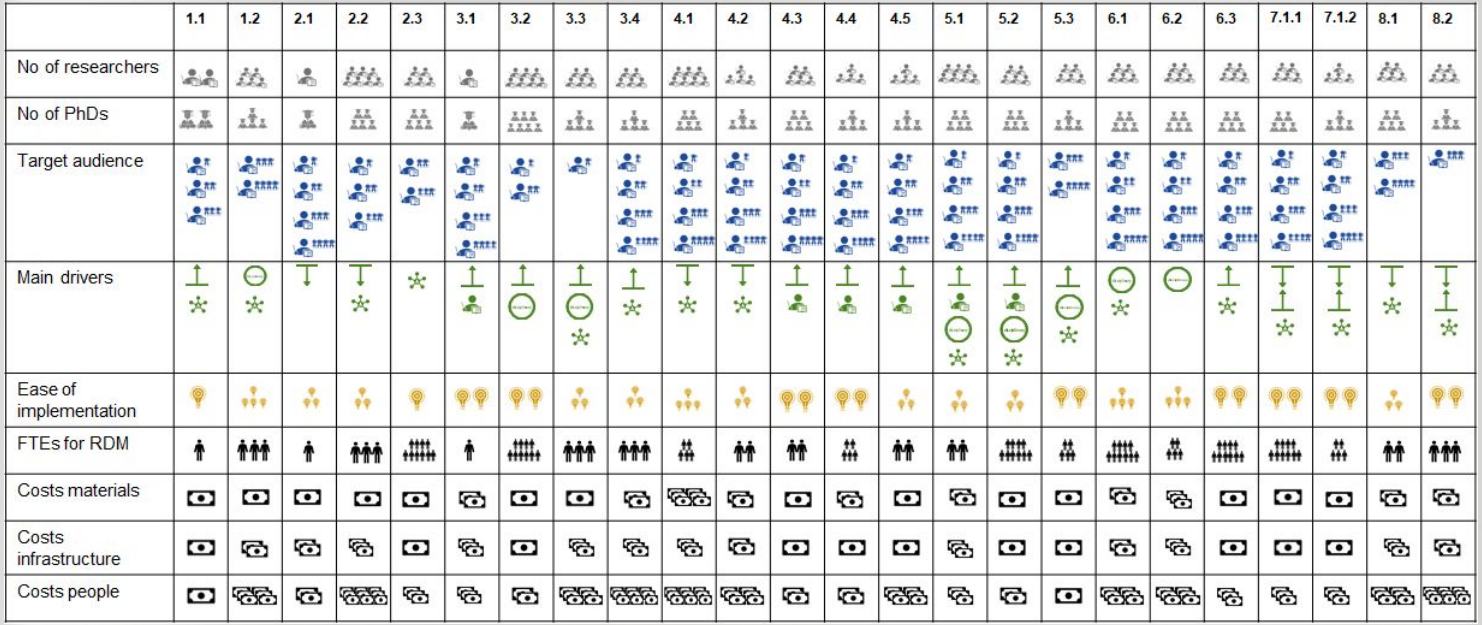


Each case has its own ingredient list



You can read the whole book...

or cherry-pick the most relevant cases



Quick preview

“Data Conversations” at Lancaster University

Little time? Little money?... but want a community of researchers talking with passion about data?

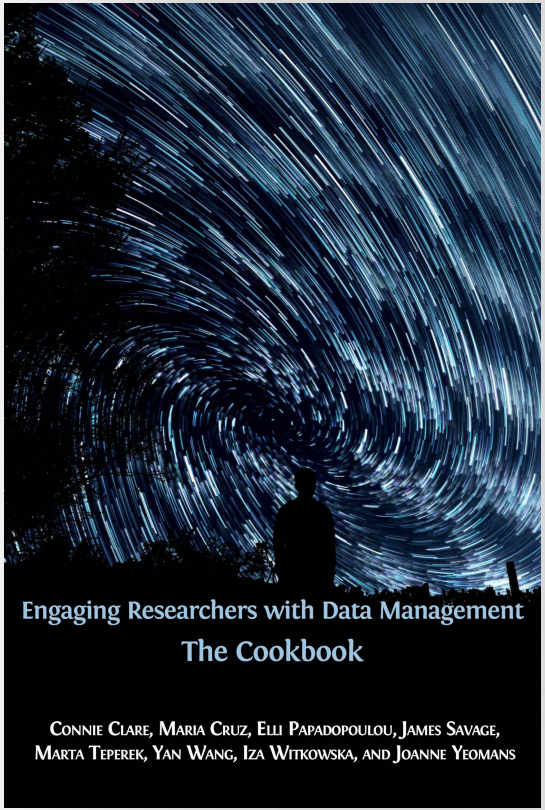
Have it all with Data Conversations!

Data managers at Utrecht University

Pool of ‘data managers’ that can be flexibly hired and embedded within research teams to provide highly targeted RDM support.

Engaging with senior researchers at Harvard Business School

Transition to digital data management practices helps engage with researchers who are about to leave the institution.



Engaging Researchers with Data Management: The Cookbook

October 2019

DOI: 10.11647/OBP.0185
https://www.openbookpublishers.com/product/1080

That's a lot of 'stuff'

But a lot of things which can be re-used

Summary of today - part 1

- Starting with RDM:
  - Why RDM and Open Science
  - The key elements of RDM support
  - Data Management Plans
  - DMPonline

Summary of today - part II

- How to engage with researchers?
  - Selfish benefits
  - Case study from Torino
  - Case study from TU Delft
  - More examples: *Engaging Researchers with Data Management: The Cookbook*

Discussion and take-home messages

Go to

www.menti.com

Use the code:

56 72 63

Thanks!

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