Introduction to research data management

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Open Research and *Digital Scholarship Center*

University of Oslo Library

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Agenda

- A bit of context

- What is research data management?

- UiO and funder requirements

- Where to get help?

Open science means transparency and **knowledge-sharing** in research processes to make knowledge **accessible** across academic groups, sectors and national boundaries. The concept of open science encompasses the entire research process […].

- The Research Council of Norway. Policy for open science 2020

The Research Council Policy for Open Science

In effect from 2020

RESEARCH FOR INNOVATION AND SUSTAINABILITY

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"**Open Science** is becoming the modus operandi for carrying out research and innovation by **sharing knowledge, data and tools** as early as possible, in open collaboration with all relevant knowledge actors and society."

Changing research assessment system

European Commission

Towards a reform of the research assessment system

Scoping Report

https://op.europa.eu/en/publication-detail/-/publication/36ebb96c-50c5-11ec-91ac-01aa75ed71a1/language-en/

Changing research assessment system – in Norway

NOR-CAM - A toolbox for recognition and rewards in academic careers

U:R Universities Norway

https://www.uhr.no/en/front-page-carousel/nor-cam-a-toolbox-for-recognition-and-rewards-in-academic-careers.5780.aspx

But why?

BMC Medical Research
Methodology

COMMENTARY   **Open Access**

Open science saves lives: lessons from the COVID-19 pandemic

Check for updates

Lonni Besançon[1,2]*, Nathan Peiffer-Smadja[3,4], Corentin Segalas[5], Haiting Jiang[6], Paola Masuzzo[7], Cooper Smout[7], Eric Billy[8], Maxime Deforet[9] and Clémence Leyrat[5,10]

Abstract

In the last decade Open Science principles have been successfully advocated for and are being slowly adopted in different research communities. In response to the COVID-19 pandemic many publishers and researchers have sped up their adoption of Open Science practices, sometimes embracing them fully and sometimes partially or in a sub-optimal manner. In this article, we express concerns about the violation of some of the Open Science principles and its potential impact on the quality of research output. We provide evidence of the misuses of these principles at different stages of the scientific process. We call for a wider adoption of Open Science practices in the hope that this work will encourage a broader endorsement of Open Science principles and serve as a reminder that science should always be a rigorous process, reliable and transparent, especially in the context of a pandemic where research findings are being translated into practice even more rapidly. We provide all data and scripts at https://osf.io/renxy/.

Keywords: Open science, Peer review, Methodology, COVID-19

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nature

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TECHNOLOGY FEATURE | 24 April 2020

Open science takes on the coronavirus pandemic

Data sharing, open-source designs for medical equipment, and hobbyists are all being harnessed to combat COVID-19.

Mark Zastrow

A student in Warsaw assembles 3D-printed protective masks. Credit: Jaap Arriens/NurPhoto/Getty

SCIENCE

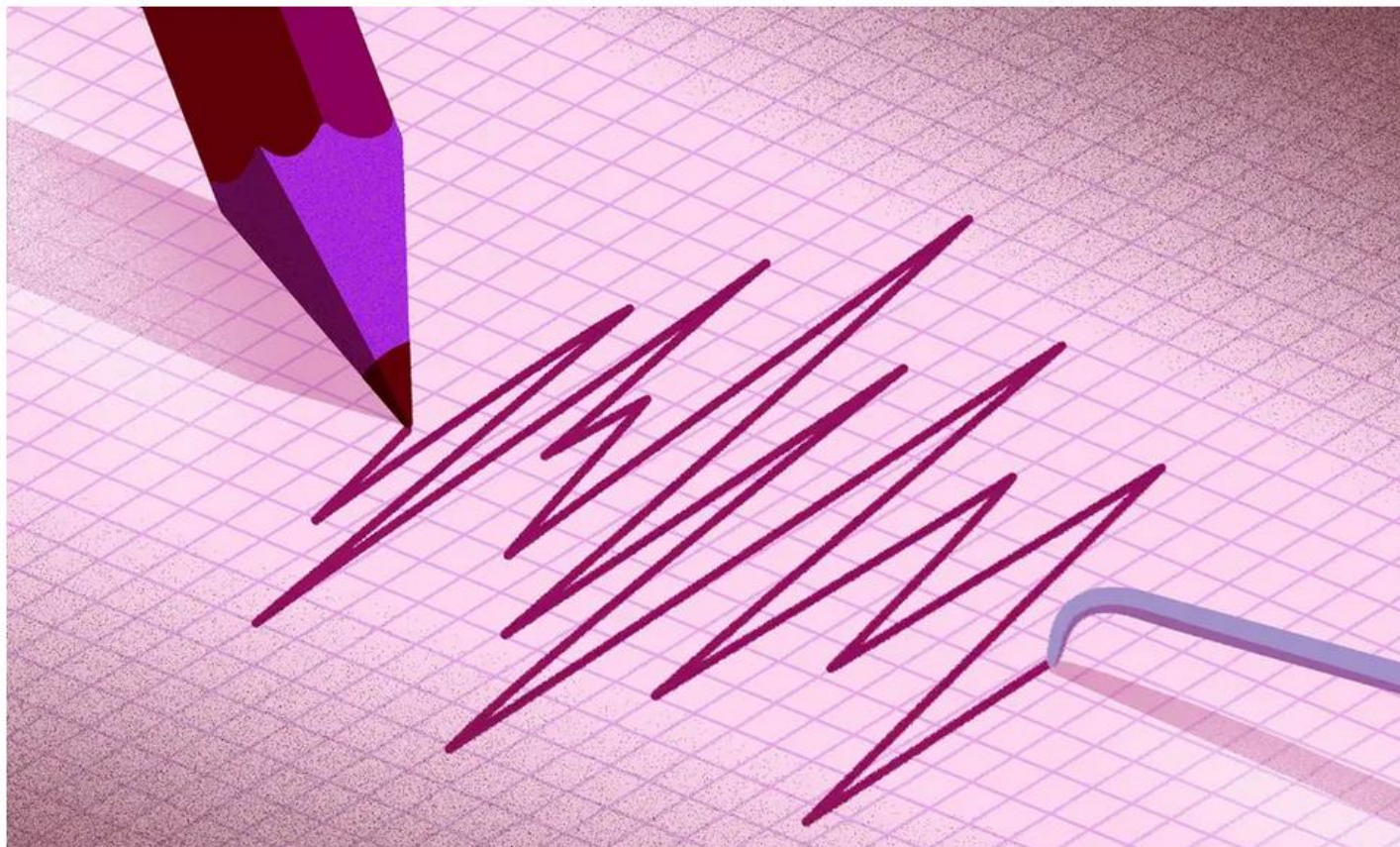# A Famous Honesty Researcher Is Retracting A Study Over Fake Data

Renowned psychologist Dan Ariely literally wrote the book on dishonesty. Now some are questioning whether the scientist himself is being dishonest.

Stephanie M. Lee
BuzzFeed News Reporter

Posted on August 20, 2021, at 2:40 p.m. ET

Tweet | Share | Copy

"When the researchers published their 2020 update, they posted the data from their 2012 paper for the first time. **Publicly sharing data was once a rarity** in science but is slowly becoming more commonplace amid calls for greater transparency."

Reproducibility

"For my first work-related tweet of 2020, I am totally bummed to announce that we have retracted last year's paper on enzymatic synthesis of beta-lactams. **The work has not been reproducible**"

"It is painful to admit, but important to do so. I apologize to all. I was a bit busy when this was submitted and did not do my job well."

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Nobel Prize-winning scientist Frances Arnold retracts paper

3 January 2020

Nobel Prize

MILLENNIUM PRIZE
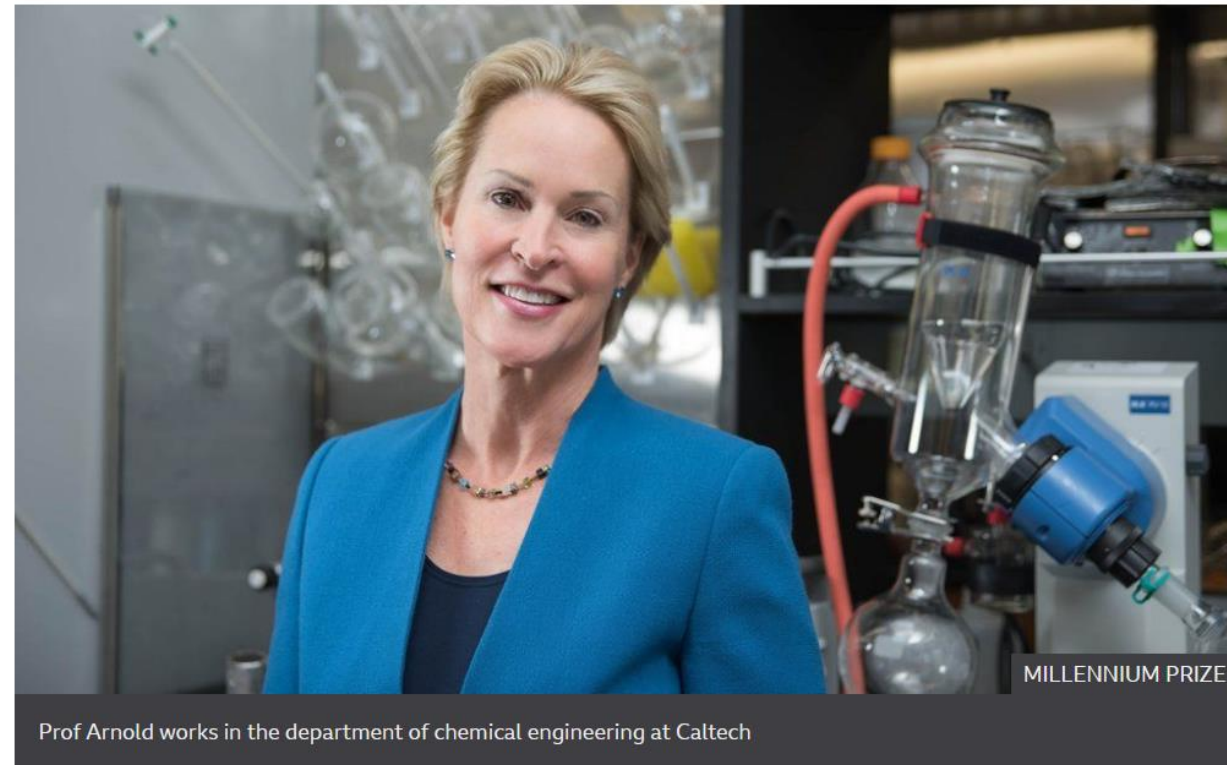
Prof Arnold works in the department of chemical engineering at Caltech

Why Open Research?

- Transparency

- Knowledge sharing

- Better validation, reproducibility and replicability

- Reduce academic misconduct

- Increased quality and impact

- Foundations for others to build upon

- Demanded by funders

Source: FOSTER consortium

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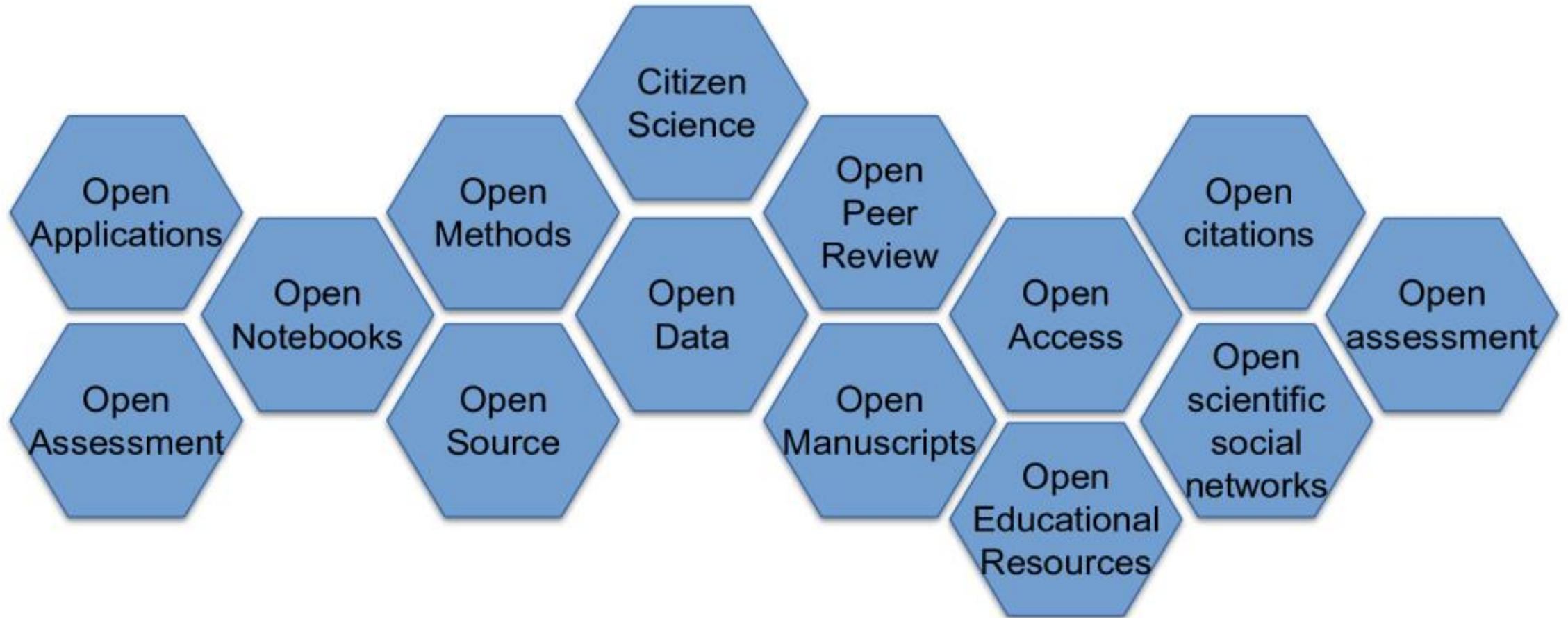
- Demanded by funders

RITMO / Centre for Interdisciplinary Studies in Rhythm, Time and Motion

"My main argument for opening all parts of the process is that it is "sharpening" the research process. You cannot be sloppy if you know that it will be exposed".

Alexander R. Jensenius, 2020

Source: FOSTER consortium

Open Research includes

As open as possible,
as closed as necessary

F indable A ccessible I nteroperable R eusable

FAIR Principles

Make your data:
- **F**indable
- **A**ccessible
- **I**nteroperable
- **R**eusable

Reusable
- Rights and licence models
- Permitted and non-permitted use

Interoperable
- XML standards
- Data Documentation Initiative
- CDISC

Accessible
- Determining what to share
- Participant consent and risk management
- Access status

Findable
- Descriptive metadata
- Persistent Identifiers

http://datafairport.org/

Data FAIRport
Find, Access, Interoperate & Re-use Data

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The circular diagram shows scholarly communication tools organized into six segments: Discovery, Analysis, Writing, Publication, Outreach, and Assessment, arranged chronologically with 2005 and 2010 markers.

Source: 101 Innovations in Scholarly Communication.

Research data management

What is research data management (RDM)?

"Research data management concerns the organisation of data, from its entry to the research cycle through to the dissemination and archiving of valuable results. It aims to ensure reliable verification of results and permits new and innovative research built on existing information."

(from, Whyte, A., Tedds, J. (2011). 'Making the Case for Research Data Management'. DCC Briefing Papers. Edinburgh: Digital Curation Centre. **Available online**)

What is research data management (RDM)?

Protection

Organization

Documentation (and metadata)

Classification

Short-term storage

Licensing

Sharing

Long-term preservation

Dissemination (publishing)

Reusing

What is research data?

Research data are representations of observations, objects, or other entities used as evidence of phenomena for the purposes of research or scholarship.

Ref: Borgman, Christine L. 2015. *Big Data, Little Data, No Data : Scholarship in the Networked World*. Cambridge, MA: MIT Press.

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What data are you working with?

What is research data?

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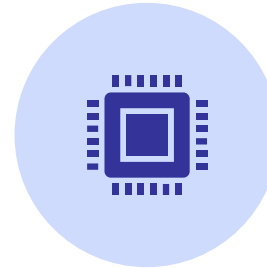OF OSLO

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Observational data
results from recognising, noting, or recording facts or occurrences of phenomena

Computational data
products of executing computer models, simulations, or workflows

Experimental data
results of procedures in controlled conditions to test or establish hypotheses or to discover or test new laws

Records
records of almost any phenomenon or human activity, can be treated as data for research

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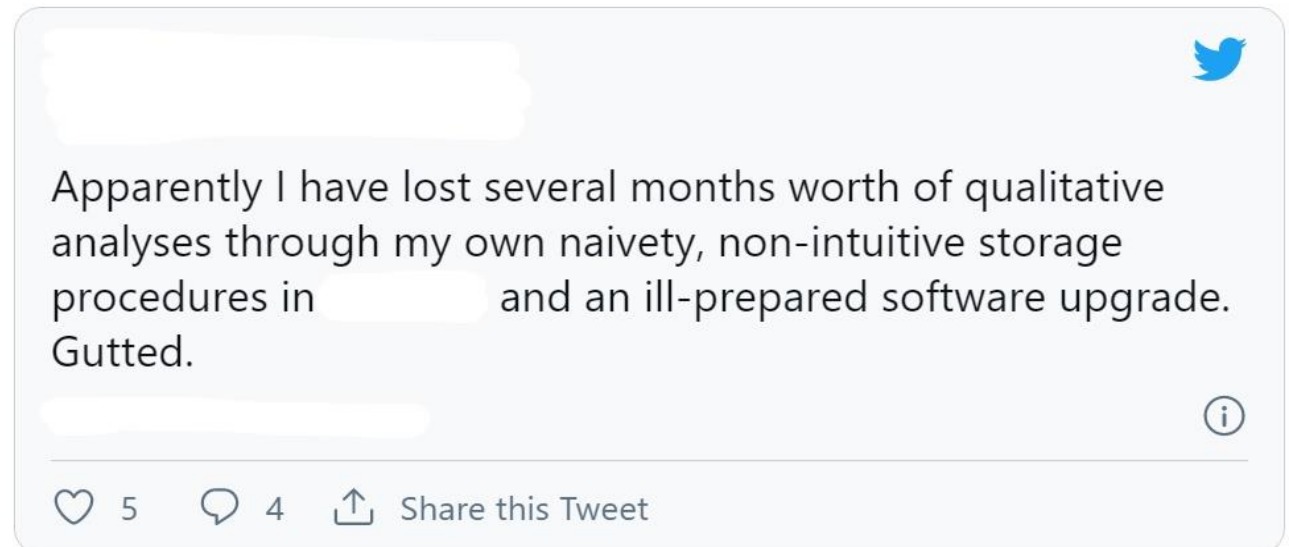OF OSLO

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- Qualitative or Quantitative

- Primary (new) or Secondary (existing)

- Personal data
  - General (non-sensitive) personal data
  - Sensitive personal data

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Why is research data management important?

- Efficiency

- Awareness of requirements, policies, regulations, ethical, and where to find support and help

- Sharing and transparency

- Quality, credibility and reproducibility

Apparently I have lost several months worth of qualitative analyses through my own naivety, non-intuitive storage procedures in _____ and an ill-prepared software upgrade. Gutted.

♡ 5   💬 4   ⬆ Share this Tweet

Research data at UiO shall:

- be made **openly available** for further usage

- be made available at an **early** stage

- have a **data management plan**

- have **metadata** and be **documented**

- must be securely **archived**

- have **licenses** for access, reuse and redistribution

- made freely available, but the actual distribution cost should be covered

HORIZON EUROPE

Open Science across the programme

| Open Science | Mainstreaming of open science practices for improved quality and efficiency of R&I, and active engagement of society |

Mandatory immediate Open Access to publications: beneficiaries must retain sufficient IPRs to comply with open access requirements;

Data sharing as 'open as possible, as closed as necessary': mandatory Data Management Plan for FAIR (Findable, Accessible, Interoperable, Reusable) research data

- Work Programmes may incentivize or oblige to adhere to **open science practices** such as involvement of citizens, or to use the **European Open Science Cloud**
- Assessment of open science practices through the **award criteria** for proposal evaluation
- Dedicated support to **open science policy actions**
- **Open Research Europe** publishing platform

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Source: Horizon Europe - Investing to shape our future | European Commission - March 2021
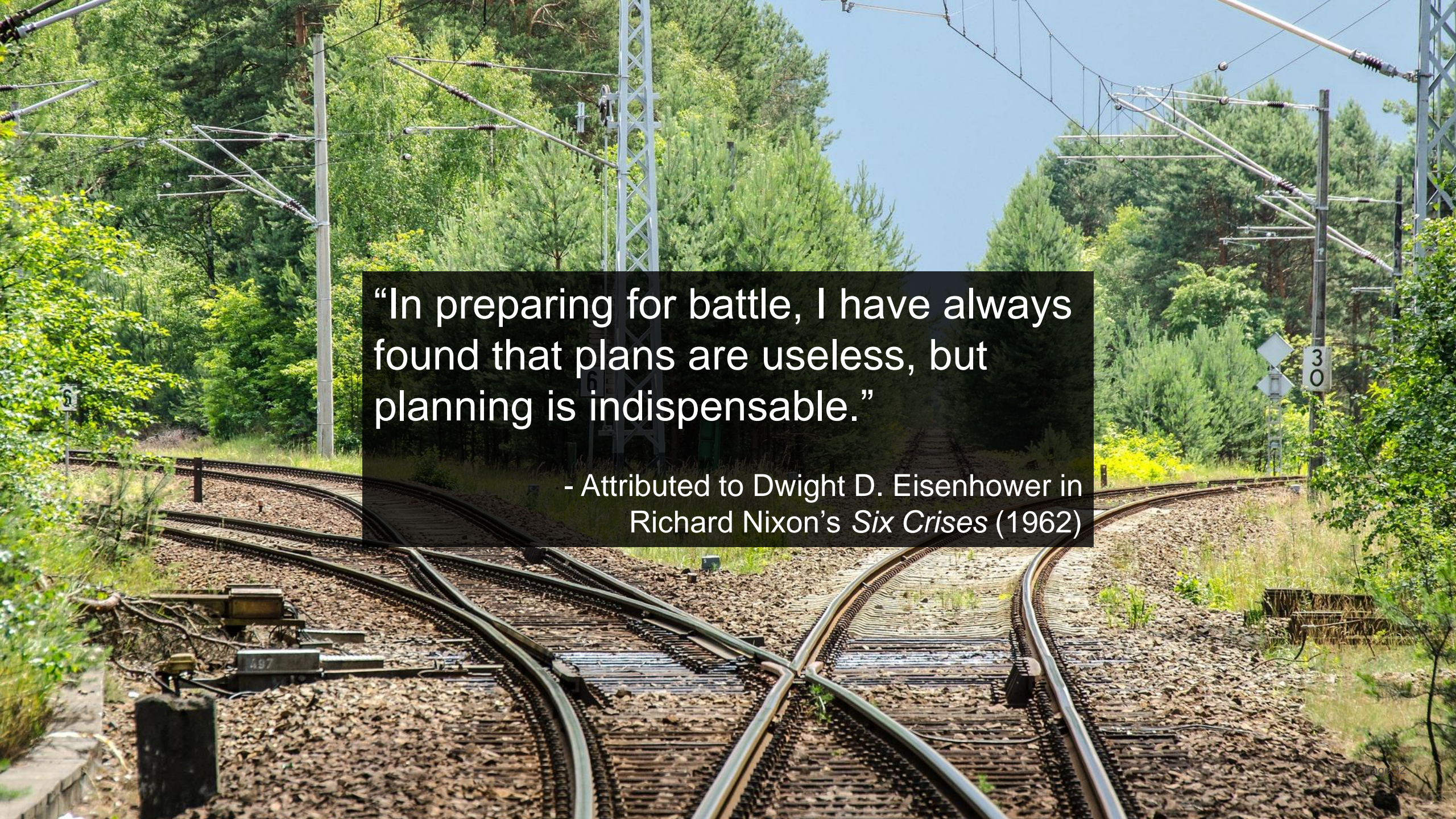
Data Management Plans (DMP)

- Assess the need to develop a data management plan in relation to all projects awarded funding.

- If you decide that a data management plan is not needed, you must provide an explanation.*

- Final version of the DMP delivered with the final report of the project.

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The Data Management Plan (DMP)

- Is a **living** document that accompanies the research project

- Specifies the **types** of data that will be generated

- Describes how you plan to **manage** your data (organize, document, classify, store, license)

- Conveys whether and how the data can be **shared**

- **Agreement** between project members

- A tool to keep overview over data

"In preparing for battle, I have always found that plans are useless, but planning is indispensable."

- Attributed to Dwight D. Eisenhower in Richard Nixon's *Six Crises* (1962)

Services and tools for RDM support:

- Research support and IT staff at your faculty/institute
- Subject librarian for your discipline
- [Research data management website](#)
- Digital Scholarship Center (DSC)
  research-data@uio.no
- Norwegian Centre for Research Data (NSD, now Sikt)

Menu

← Libraries and centres

Norwegian version of this page

Digital Scholarship Centre

At the Digital Scholarship Centre (DSC) you get guidance on how you can make the best possible use of digital tools and methods in your research and communication activities.
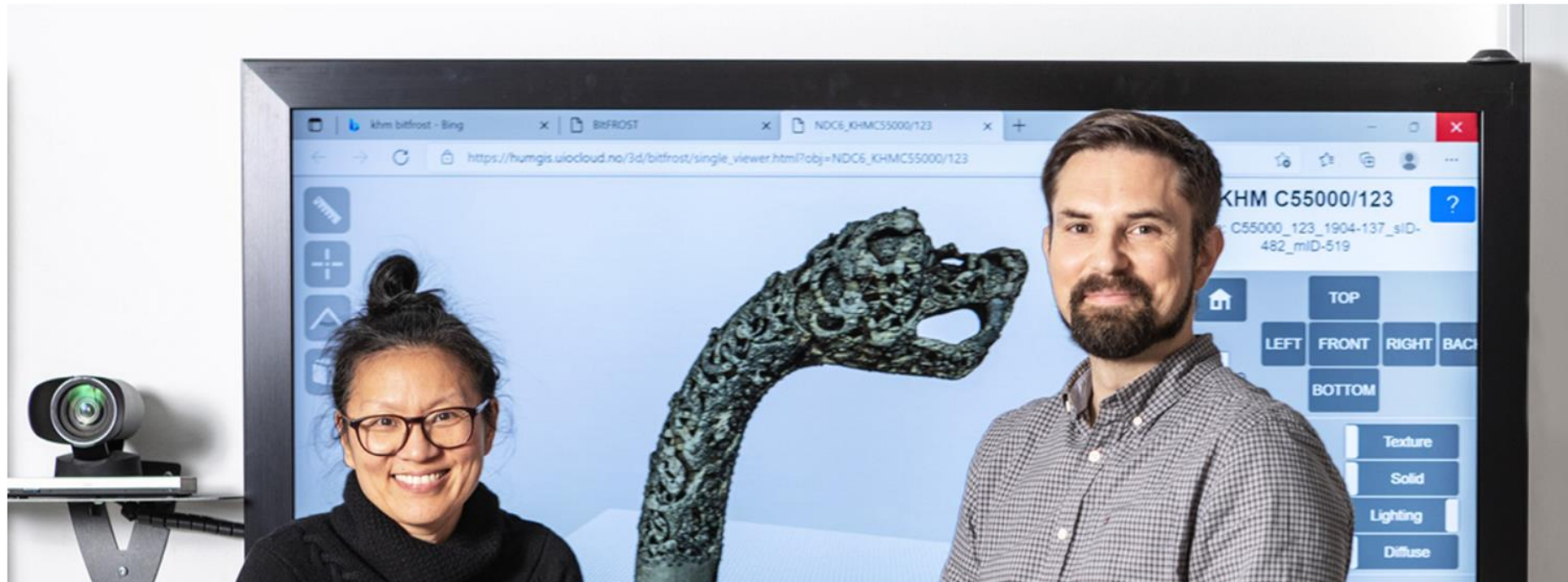
Open Access →

Information about open access publishing, publisher agreements, self-archiving, requirements, and guidelines.

Open and reproducible research →

Make your research more transparent and reproducible.

Research Data Management →

Managing your data both during and after a research project.

Text-mining →

Information about digital tools for searching, mining, and analysing textual data.

Systematic search →

Information about systematic literature searching, how to get started, and how to get help.

Visualisation →

Use of visual methods to explore, communicate and understand data.

Carpentry@UiO →

Offers workshops in foundational digital skills such as coding and data management.

Reference management →

Styles, tools, and information on reference management.

Digiforsk blog →

A blog about work and resources at UiO where digital research methods are involved. Posts in both Norwegian and English.

Research data

Good research data management plays an essential role in Open Science, which is increasingly important for scholars around the globe. The University Library provides courses on key concepts as a part of the Skills Development for Research Data project.

We can provide training on the following topics:

- Introduction to research data management (RDM)

- Current data management policies (UiO, Research Council of Norway, EU)

- Data management planning

- Data organization

- Metadata and documentation

- Data classification and storage

- Sharing and archiving research data

- Copyright and licensing

- Data discovery and reuse

https://www.ub.uio.no/english/courses-events/courses/other/research-data/

Upcoming sessions

Introduction to research data management

Nov. 3, 9:00 AM, Zoom

Data management planning

Nov. 4, 9:00 AM, Zoom

Data organization, metadata, and documentation

Nov. 9, 9:00 AM, Zoom

Data classification and storage selection

Nov. 11, 9:00 AM, Zoom

Copyright and licensing

Nov. 14, 1:00 PM, Zoom

Sharing and archiving research data

Nov. 16, 9:00 AM, Zoom

Finding and reusing research data

Nov. 18, 9:00 AM, Zoom

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https://www.ub.uio.no/english/courses-events/courses/other/research-data/

Carpentry: Training on foundational coding and data science skills

At University of Oslo (UiO), Carpentries workshops based on Software Carpentry, Data Carpentry, and Library Carpentry lessons are offered to facilitate sharing and re-using of code and data among graduates and researchers from all faculties and units.

Carpentry: Version Control with Git

Nov. 4, 9:00 AM, Domus Theologica: Room 214

Carpentry: R for Reproducible Scientific Analysis (Novices)

Nov. 22, 9:00 AM, Domus Theologica: Room 214

Data Carpentry: Social Sciences and Humanities Using R, November 24 and 25

Nov. 24, 9:00 AM, Kristine Bonnevies hus, Room 3127

Data Carpentry: Social Sciences and Humanities Using R, November 24 and 25

Nov. 25, Kristine Bonnevies hus, Room 3127

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www.ub.uio.no/english/courses-events/courses/other/Carpentry/
www.uio.no/carpentry

Open and reproducible research

- course-materials

Open and reproducible research

More and more researchers and students across disciplines are implementing open research practices, preregistering their hypotheses, methods, and analysis plans and sharing research materials, data and analysis scripts. This course series will give an introduction to open and reproducible research practices and guides on how to implement them in your own research practice.

Previous
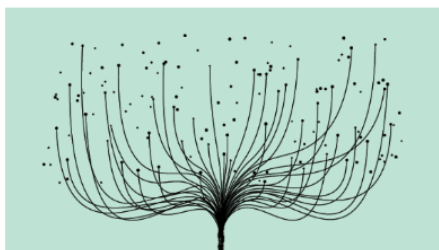
Time and place: Oct. 26, 2022 1:00 PM–2:30 PM, Zoom

Reproducible research workflows

Learn about tools and practices for more reproducible and effective research.

Time and place: Oct. 21, 2022 9:00 AM–10:30 AM, Zoom

Preregistration on Open Science Framework (OSF)

Learn about how to preregister your study on Open Science Framework (OSF) and how to navigate the platform.

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https://www.ub.uio.no/english/courses-events/courses/other/research-reproducibility/

University of Oslo Library

OA publishing and research visibility

OA publishing and research visibility

Keep copyrights to your own work by publishing in Open Access journals. Find out your research impact. The course gives you practical support in publishing process and making your research visible.

Upcoming

Time and place: Nov. 10, 2022 9:00 AM–12:00 PM, Zoom Add to calendar

OA-publishing and research visibility

Keep copyrights to your own work by publishing in Open Access journals. Find out your research impact. The course gives you practical support in publishing process and making your research visible.

https://www.ub.uio.no/english/courses-events/courses/other/medicine-publishing/

Open Science Lunch

Open Science Lunch

Each last Thursday of the month at 12:00 we invite you to join us for a lunch seminar to hear about how to make your research more open. We will discuss research transparency and visibility, open publishing, data sharing, and more!

Upcoming

Time and place: Nov. 24, 2022 12:00 PM–1:00 PM, Hybrid: Georg Sverdrups hus and Zoom Add to calendar

Open Science Lunch: CRediT your co-authors

Learn about CRediT - a new international standard for transparent assignment of individual research contributions.

Previous

Time and place: Oct. 27, 2022 12:00 PM–1:00 PM, Hybrid: Zoom and Georg Sverdrups hus

Open Science Lunch: Enabling reuse of non-digital data

Learn about how we can increase reuse of non-digital data such as plants, fossils or organ tissues.

https://www.ub.uio.no/english/courses-events/events/open-science-lunch/

ReproducibiliTea

Journal Clubs

Our mailing list:

https://sympa.uio.no/uio.no/subscribe/open-science-oslo

University of Oslo

Welcome

Our journal club is open to both staff and students at UiO across all departments. Everyone is welcome to join us - whether you are an enthusiast, a skeptic, or a cautious explorer. Feel free to get in touch if you are interested to participate or contribute!

Our mission

- provide an informal and friendly platform for discussions about meta scientific topics
- help each other get familiarized with open science practices (e.g., pre-registrations, sharing data, sharing preprints, etc.)
- connect students and researchers from various disciplines who are interested in meta science.

Format

Before each meeting, we read an article on meta scientific topics, which we then discuss during the meeting. At each meeting, a different discussion leader will begin by providing a short overview of the paper and facilitate discussion throughout the meeting. Anyone can propose a possible paper or topic to present if we have not covered it already. Grab a cup of tea (coffee?) and join us! Due to the current pandemic, all sessions will be held online (Zoom) for the time being.

🌐 Universitetet i Oslo
⚙ osf.io/mvx54
Z collection
❓ timo.b.roettger@gmail.com
👤 Timo B. Roettger
👤 Agata Bochynska

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Thank you!

Contact us at:

research-data@uio.no

November 3, 2022

Useful Links

- [RDMkit (elixir-europe.org)](elixir-europe.org)

- [RDA | Research Data Sharing without barriers (rd-alliance.org)](rd-alliance.org)

And a fun video about research data management:

https://www.youtube.com/watch?v=N2zK3sAtr-4

Other Sources

- FAIR principles

- About DMP from Nature: https://www.nature.com/articles/d41586-018-03071-1

- Michener, W. K. (2015). Ten Simple Rules for Creating a Good Data Management Plan. *PLoS Computational Biology,* 11(10): e1004525. https://doi.org/10.1371/journal.pcbi.1004525

- Science Europe: Practical guide to the international alignment of research data management

- The Research Council of Norway: Open Science