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Scientific Communication: publishing and evaluation

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PhD Course in Statistics

September 18, 2018



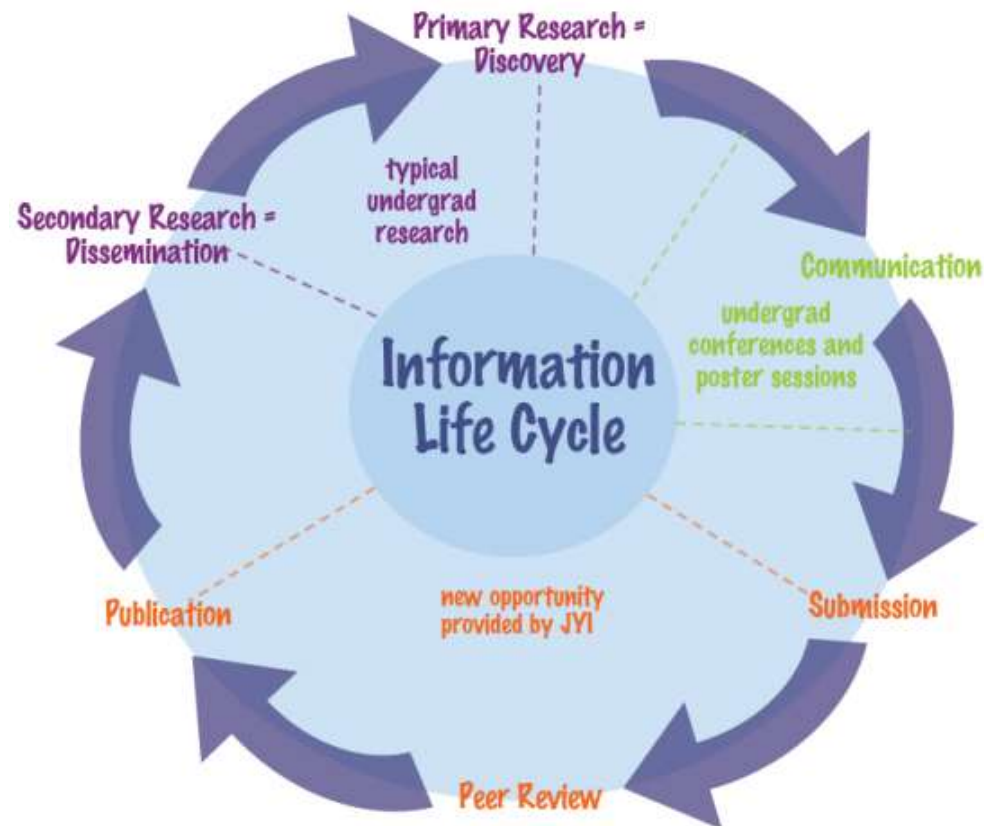


What we will see today:

- **Scholarly Communication:** traditional publishing and Open Access
- **Bibliometric:** traditional and innovative tools for scientific evaluation
- **Research data management**

Scientific communication

» the process of publication and dissemination of research findings

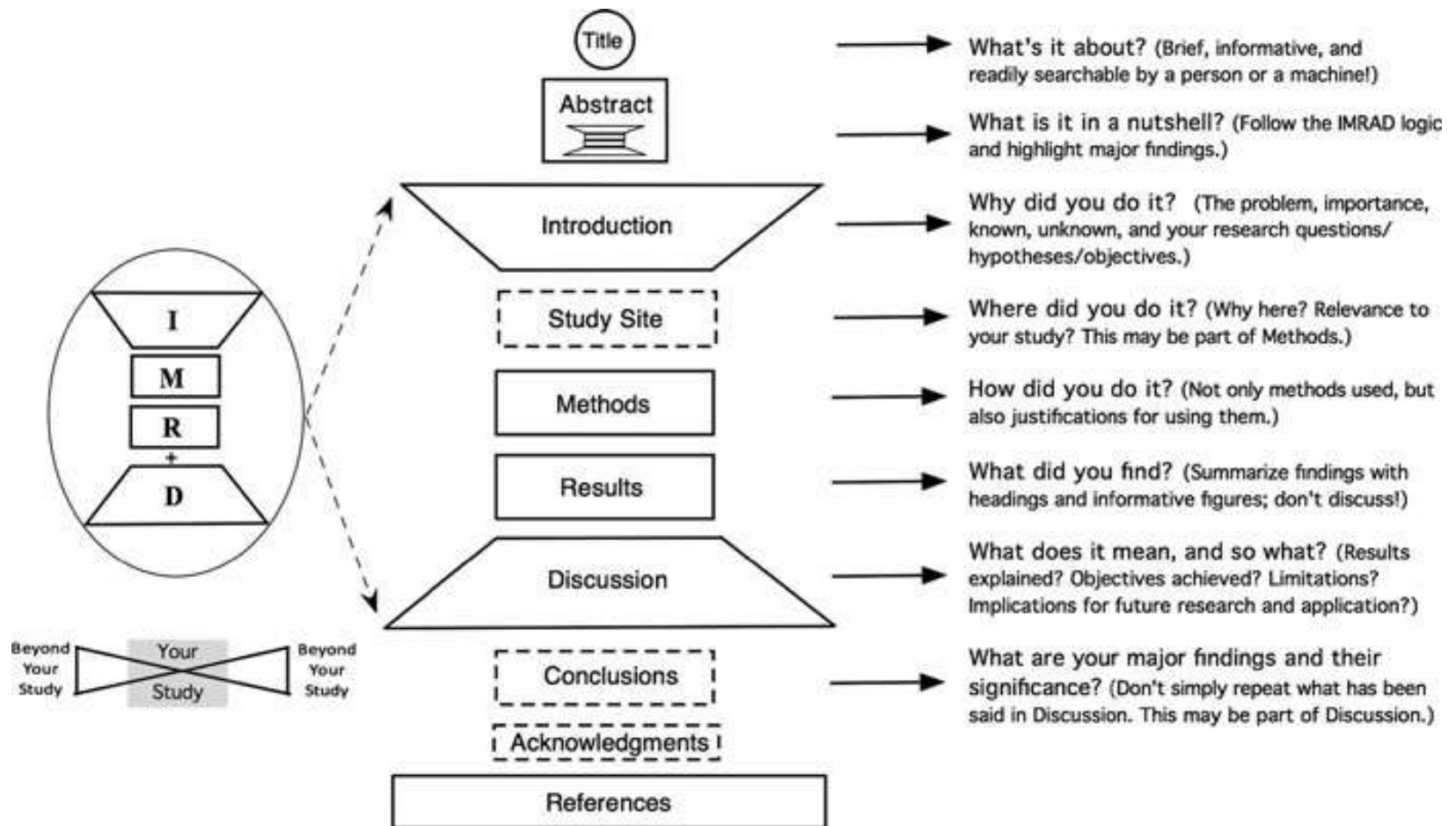




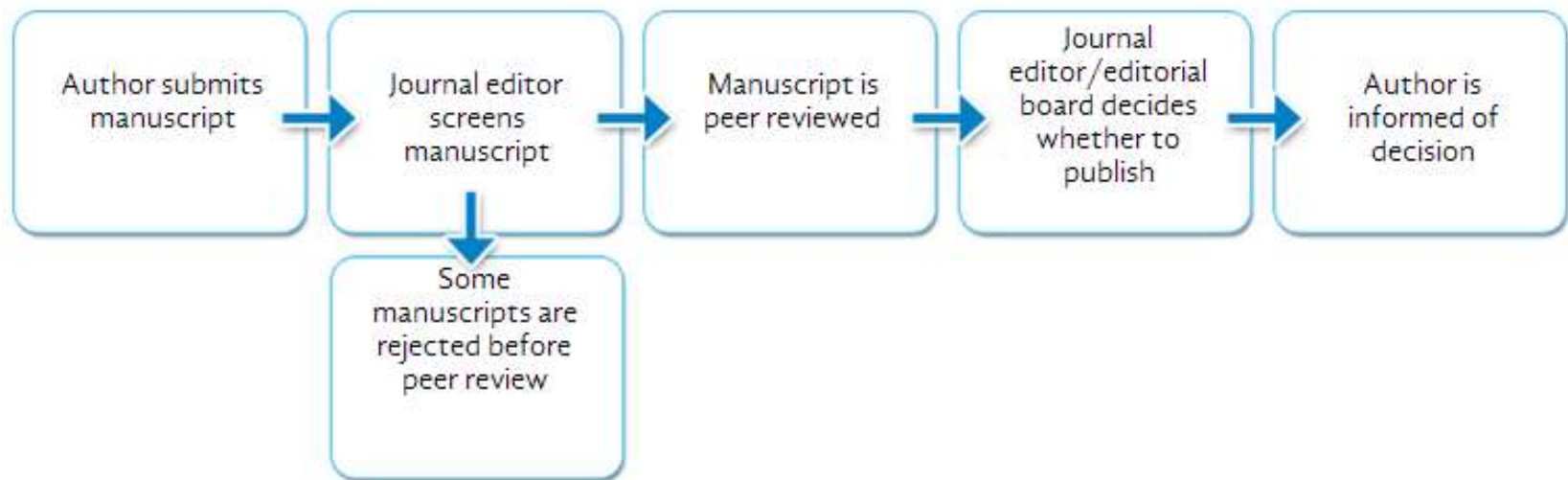
Research publications:

- PAPER OR ARTICLE
- LETTER OR COMMUNICATION
- WORKING PAPER
- TECHNICAL REPORT
- RESEARCH NOTE
- REVIEW

Scientific writing: structure of a scientific paper



Process of publication of a scientific paper





Scientific journals

STM (Scientific, Technical and Medical) Journals

Journal or Serial

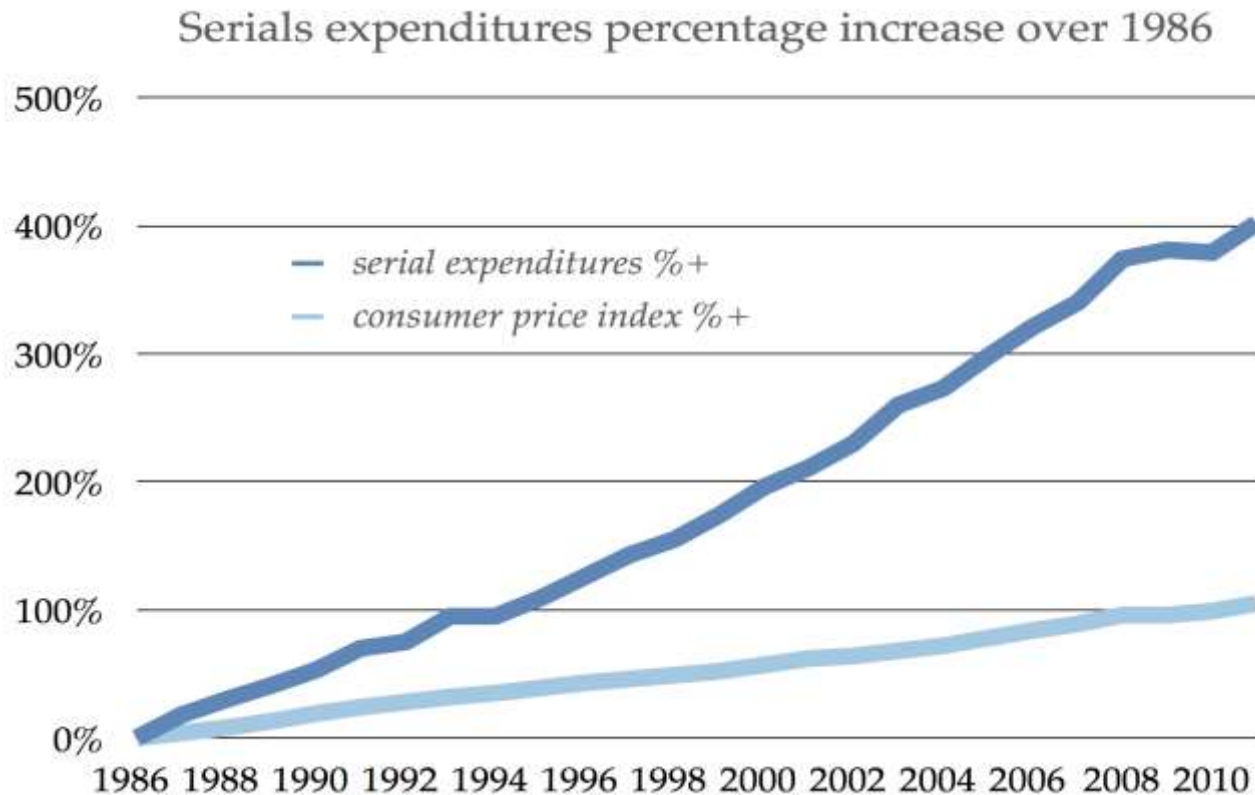
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publication that appears in intervals of time longer than 24 hours

- Addressed to the scientific community (expert audience)
- With selected contents
- Referee system

In STM field it is imperative to publish research as soon as possible, so journals are the main way to **quickly disseminate information**

Serials crisis



Scholarly journal expenditures percentage increase 1986–2010 compared to consumer price index.
Data from Association for Research Libraries.

<https://blogs.harvard.edu/pamphlet/2013/01/29/why-open-access-is-better-for-scholarly-societies/>

And the future of scientific publication?

OPEN ACCESS



Open access logo, originally designed by
[Public Library of Science](https://commons.wikimedia.org/wiki/File:Open_Access_logo_PLoS_white.svg).

https://commons.wikimedia.org/wiki/File:Open_Access_logo_PLoS_white.svg



What is Open Access?

Open-access (OA) literature is

digital, online, free of charge, and free of most copyright and licensing restrictions.

What makes it possible is the internet and the consent of the author or copyright-holder.

A Very Brief Introduction to Open Access by Peter Suber

<http://legacy.earlham.edu/~peters/fos/brief.htm>



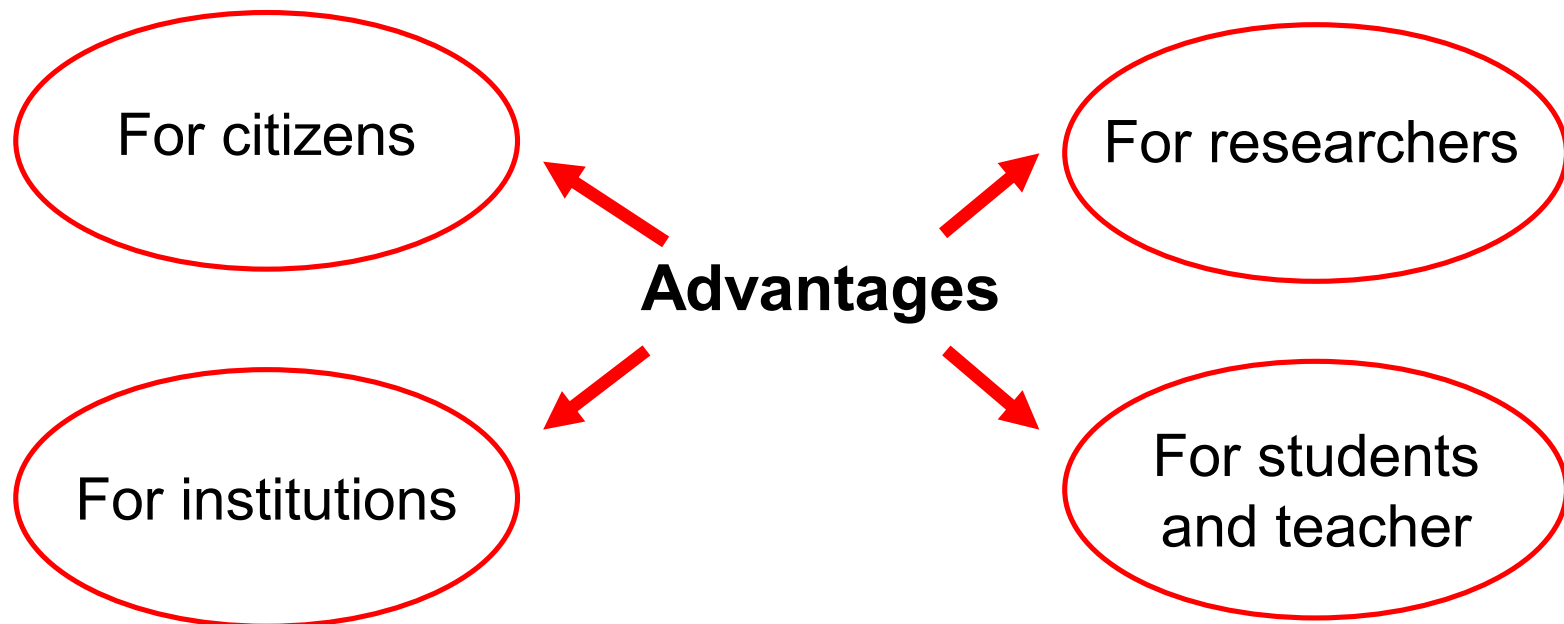
Which are the benefits?

Nowadays, it is widely recognized that **making research results more accessible contributes to better and more efficient science, and to innovation in the public and private sectors.**

European Commission, Horizon2020

<https://ec.europa.eu/programmes/horizon2020/en/h2020-section/open-science-open-access>

Which are the benefits?





How do you make your work openly accessible?

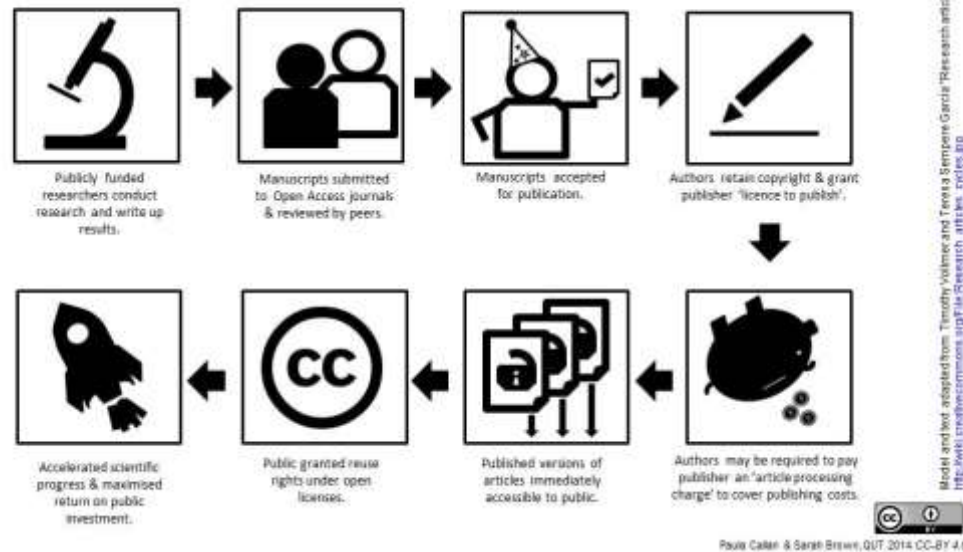


GOLDEN ROAD

GREEN ROAD

GOLD OPEN ACCESS

maximised dissemination, economic efficiency & social impact



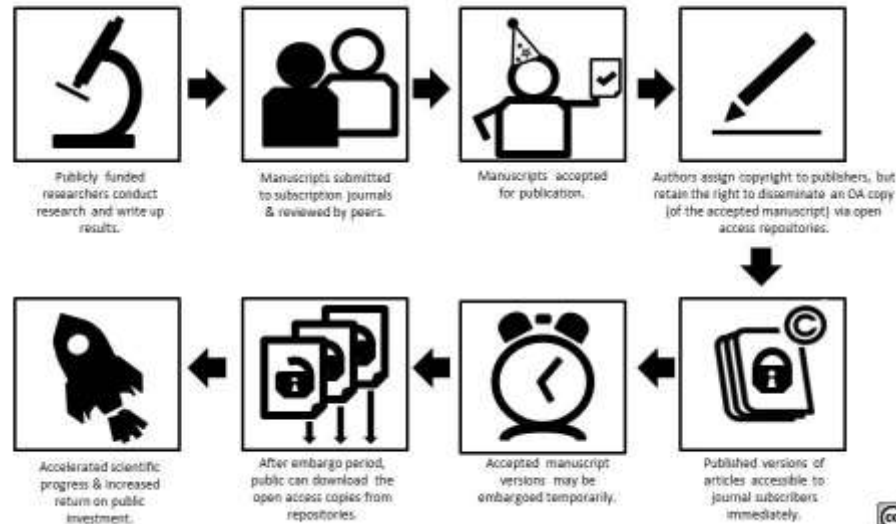
<https://aoasg.org.au/what-is-open-access/>

- Publish in an **open access journal**
- or in a journal which supports open access (**hybrid**)
- Open access **fee is paid by the author**, or on their behalf for example by their institution
- Public access is to the **final published article**
- Access is immediate

<https://www.elsevier.com/about/open-science/open-access#options>

GREEN OPEN ACCESS

increased dissemination, economic efficiency & social impact



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<https://aoasg.org.au/what-is-open-access/>

- **Self-archive** your article
- Free access to **a version of your article**
- **No fee is payable** by the author as publishing costs are covered by library subscriptions
- **Authors retain the right** to re-use their articles for a wide range of purposes

<https://www.elsevier.com/about/open-science/open-access#options>

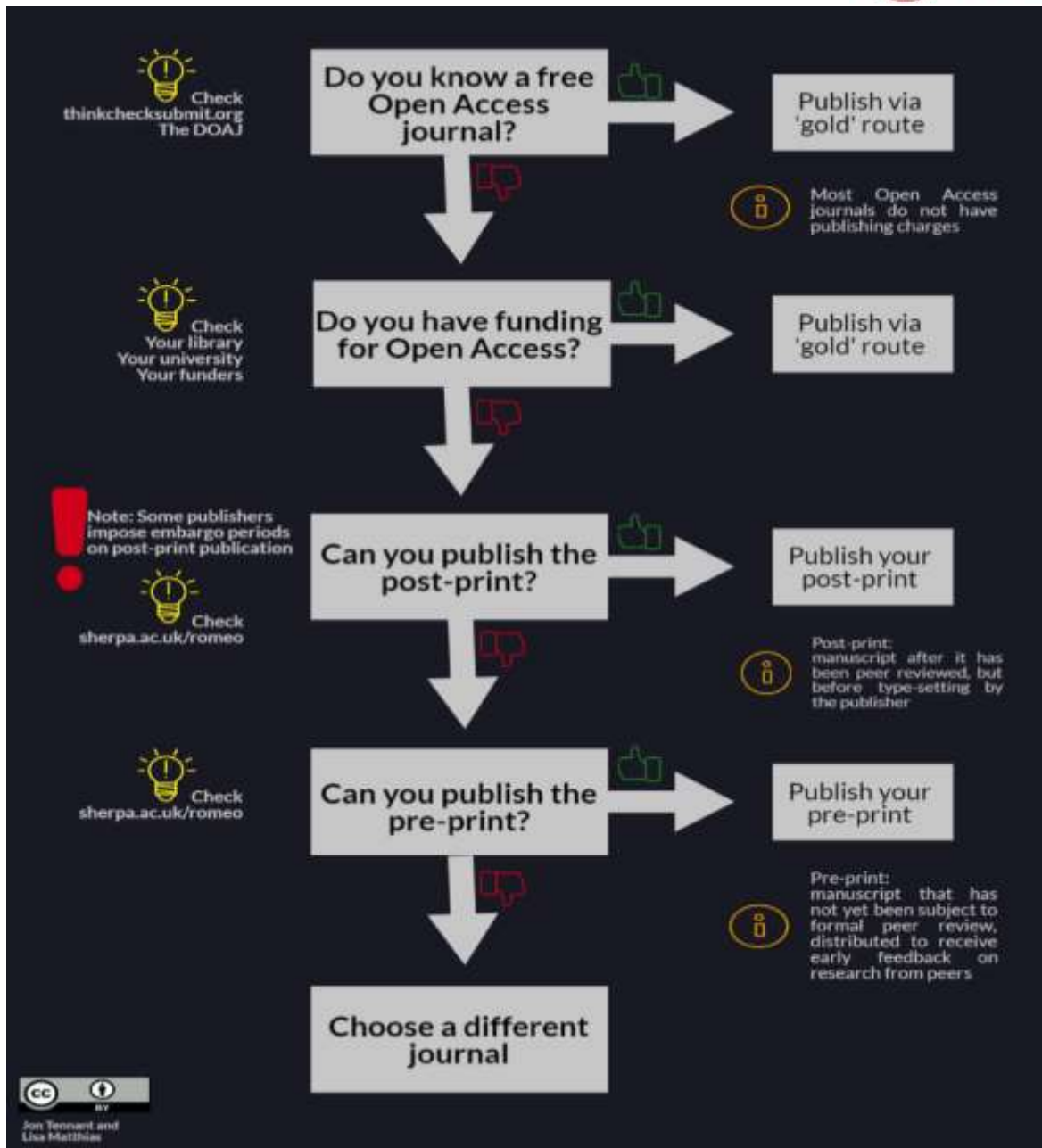


Advice to Authors: you are the owner of copyrights!

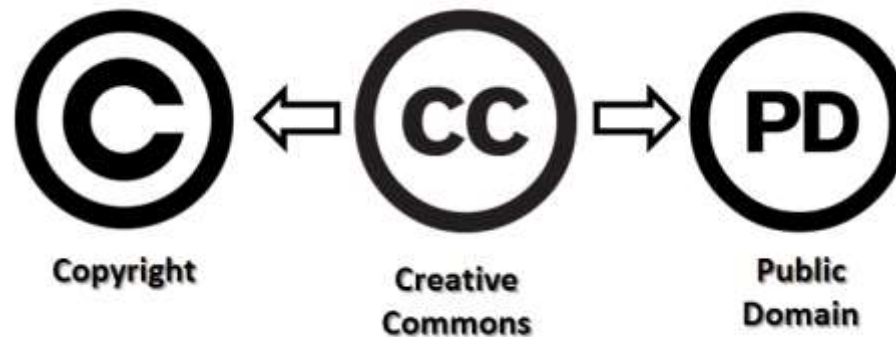
1. Read your contracts and retain some of rights → [SPARC Author Addendum](#)
2. Find out more about publishers' open access policies → [SHERPA RoMEO](#)
3. Pick your publisher carefully and consider to publish in an open access journal → [Directory of Open Access Journals](#)
4. Be careful of predatory Open Access journals → [Beall's list of predatory journals and publishers](#)
5. Need Help? Ask the [Library Helpline](#) of Padua University

How to make your research open access

https://figshare.com/articles/How_to_make_your_research_open_access_For_free_and_legally_/5285512/3



Copyright and Creative Commons



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You can redistribute (copy, publish, display, communicate, etc.)
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Evaluation of scientific research: why ?

- Single researcher: recruitment, promotion, grant awarding career
- Research groups (same department, faculty, university, research organization, nation): to grant funding
- Scientific journals: to determine the most influential journals in a research area



Evaluation of scientific research: Italy

The **National Committee of Guarantors for Research** (*Comitato Nazionale dei Garanti per la Ricerca – CNGR*)

Consultative body to the Ministry of Education, University and Research (MIUR), tasked to promote the quality of research and ensure proper functioning of peer reviews.

The **National Agency for the Evaluation of the University and Research Systems** (*Agenzia Nazionale di Valutazione del sistema Universitario e della Ricerca – ANVUR*)

Reports to the MIUR and, on the basis of autonomy, impartiality, professionalism and transparency, works to ensure the quality of higher education and research in Italy.

Evaluation of scientific research: Italy

Two **methodologies** are used:

- **Bibliometric analysis**, based on Impact Factor (IF) of the review and on the number of citations received in a year by articles published (therefore, a quantitative analysis of the impact of journal papers).
- **Peer review**, assigned to referees selected by expert groups' members (with the help of about 14,000 external reviewers, of whom more than 4,000 were from outside Italy).



Evaluation of scientific research: how

Qualitative assessment : review by colleague-scientists (peers)

Quantitative assessment: analysis of bibliographic citations (bibliometric indicators)

Other criteria: congress participation as invited speaker, patents etc.



Evaluation of scientific research: Peer Review

A system to **assess the quality of scientific research** before it is published, varying across journals and research fields.

- SINGLE-BLIND PEER REVIEW
- DOUBLE-BLIND PEER REVIEW
- OPEN PEER REVIEW



Bibliometrics

The branch of library science concerned with the application of **mathematical and statistical analysis to bibliography**; the statistical analysis of books, articles, or other media of communication.

<http://www.oxforddictionaries.com/definition/english/bibliometrics>

That is...

data about publications, or citation frequency



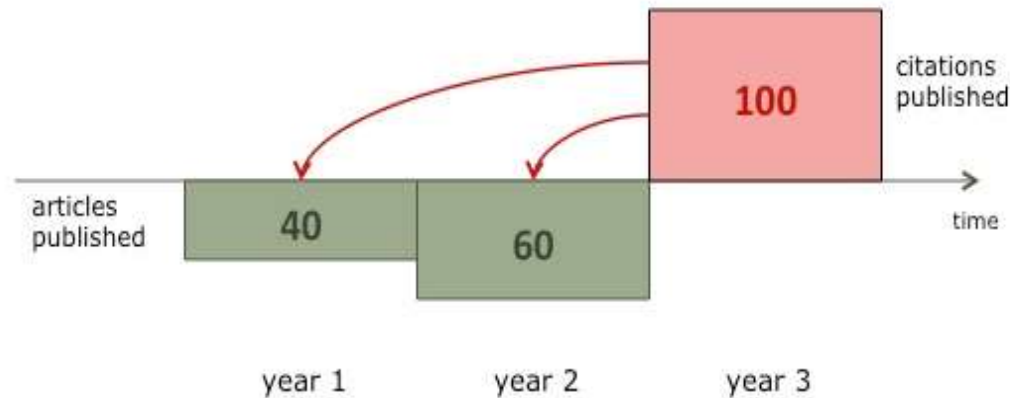
Evaluation of scientific research : Citation Analysis

Citations analysis: number of citations received by a publication

“Assuming that scientists cite the work that they have found useful in pursuing their own research, the number of citations received by a publication is seen as a quantitative measure of the resonance and impact that this publication has created in the scientific community.” (Neuhaus, 2006)

The Impact Factor

Introduced in 1950's by Eugene Garfield: ISI



$$IF(\text{year } 3) = 100 / (40 + 60) = 1$$

Bibliometrics tools

The most well-known bibliometrics tools are:

Journal Citation Report

Scopus



*Databases that measure
journal impact*

Web of Science

Scopus



*Databases mostly used
for citation searching*

Google Scholar



Other Journal Ranking Tools

Freely available Tools (for journal or citations impact):

SCImago SJR (free, Scopus citations data)

<http://www.scimagojr.com/index.php>

Google Scholar Metrics (Journals) (free, publications 2010 - 2014)

<http://scholar.google.com/intl/en/scholar/metrics.html>

Google Scholar+Harzing's Publish or Perish (PoP)

<http://www.harzing.com/>

And the authors?

HIRSCH INDEX (h-index)

- It measures the output of a scientist through the number of citations of his published works and the number of published works
- It has been applied also to journals, research teams, institutions, nations (see Scimago)

ORCID



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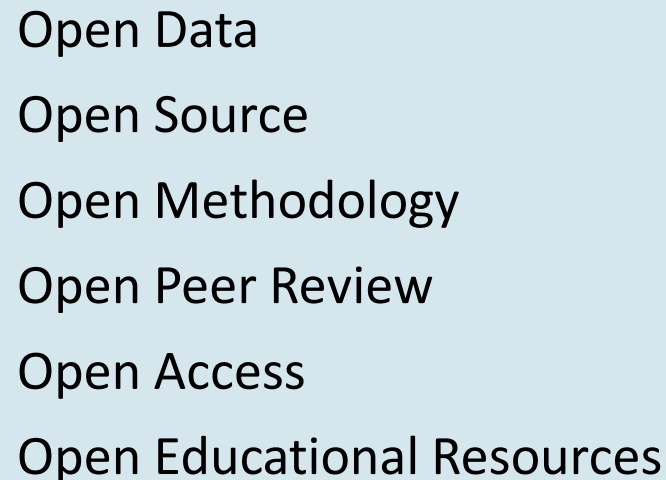
Introduction to Open Science

“Open science is the movement to make scientific research, data and dissemination accessible to all levels of an inquiring society”

FOSTER consortium



Open
Science



- Open Data
- Open Source
- Open Methodology
- Open Peer Review
- Open Access
- Open Educational Resources

What are research data? - 1

Research Data

recorded **information** (regardless of the form or the media in which they may exist) **necessary to support or validate a research project's observations**, findings or outputs.

Digital Objects

simple digital objects (discrete digital items such as text files, image files or sound files, along **with their related identifiers and metadata**) or **complex digital objects** (discrete digital objects made by combining a number of other digital objects, such as websites).

Databases

structured **collections of records** or data stored in a computer system.

What are research data? - 2

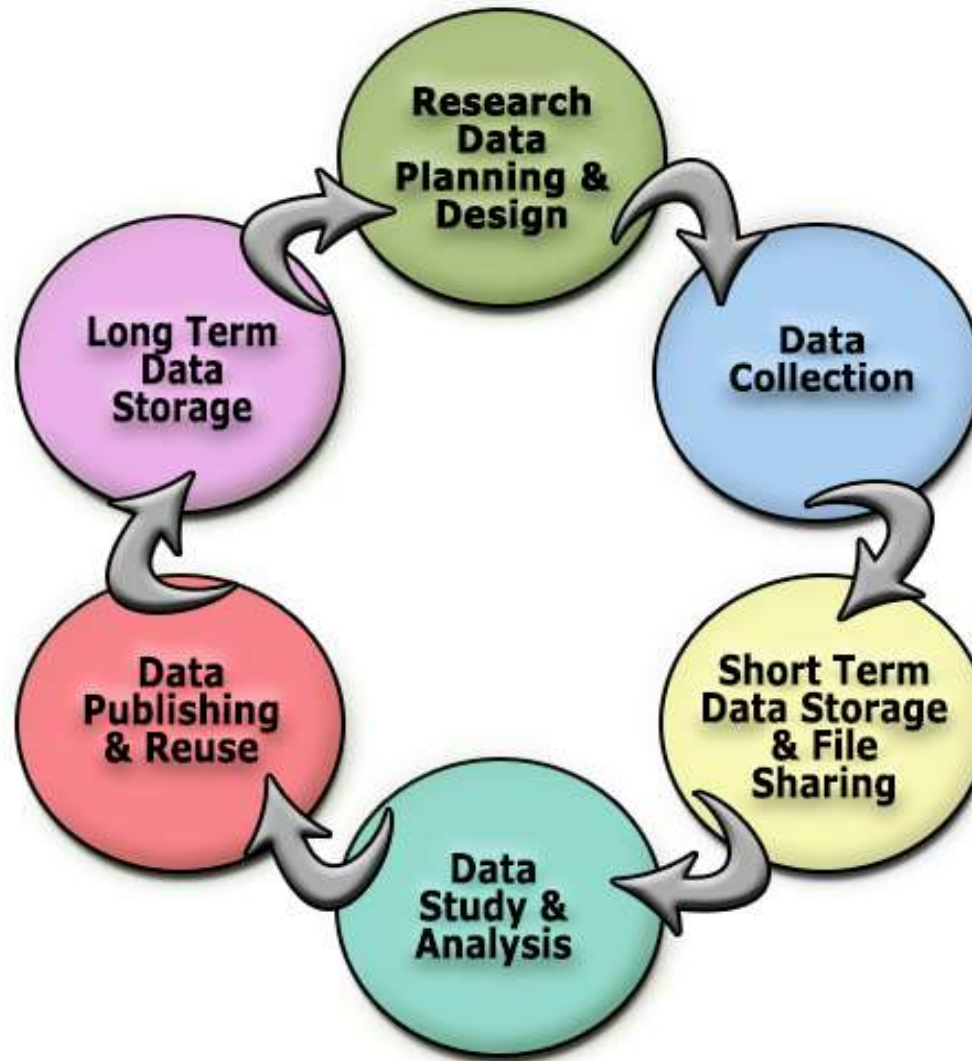
General categories of data:

- Observational (e.g. sensor readings, survey instruments)
- Experimental (e.g. lab equipment readings)
- Simulation (e.g. climate models)
- Derived or compiled (e.g. compiled databases, text or data mining)

Examples of research data:

- Digital texts or digital copies of text
- Spreadsheets
- Audio, video
- Computer Aided Design (CAD)
- Waveforms
- Statistics (SPSS, SAS)
- Databases
- Geographic Information Systems (GIS) and spatial data
- Digital copies of images
- Matlab files
- Computer code
- Protein or genetic sequences
- Artistic products
- Web files

Research Data Life Cycle



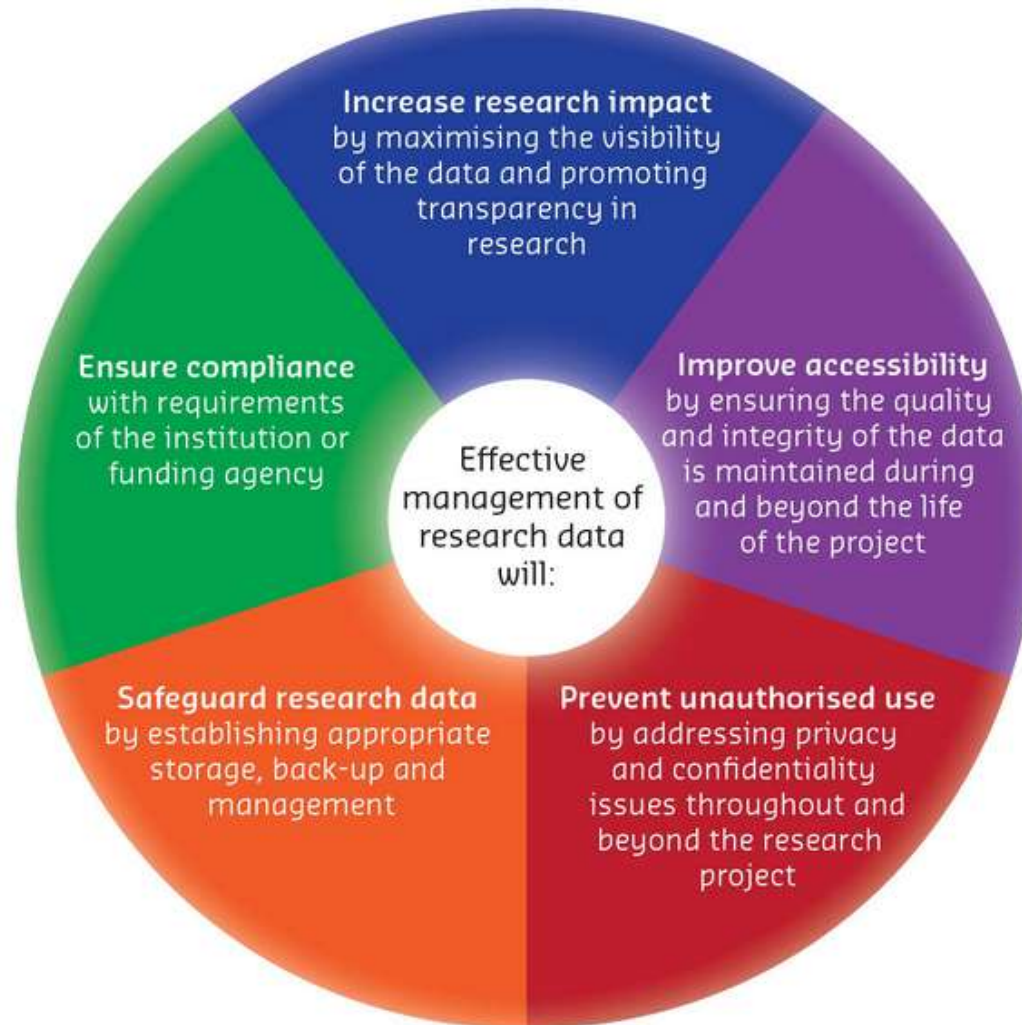
Metadata = data about data

It is defined as the data providing information about one or more aspects of the data and it is used to summarize basic information about data, which can make easier to track and work with specific data.

Metadata should at least specify:

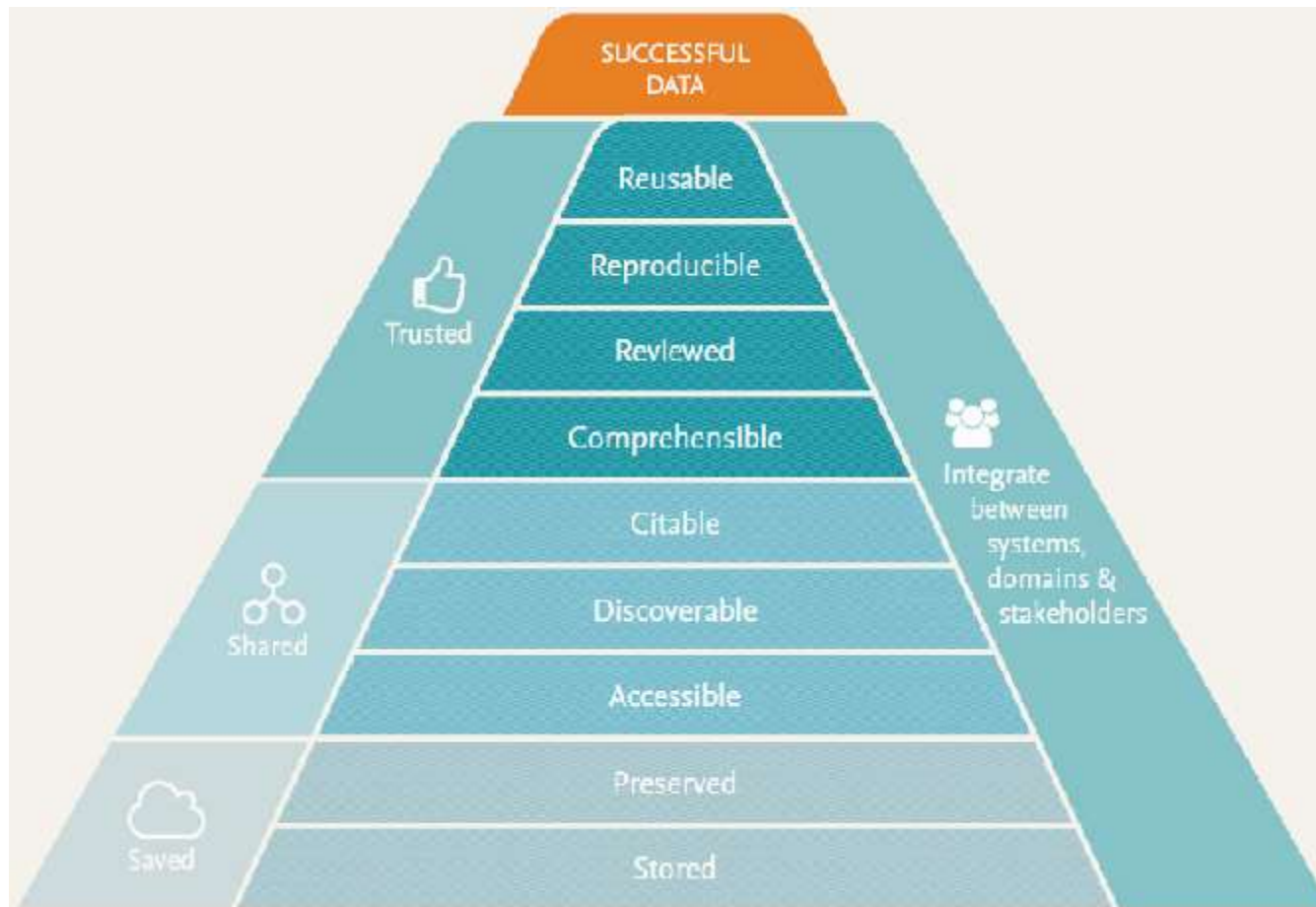
- an identifier (a DOI),
- a creator (the name and affiliation of the main researchers involved in producing the dataset),
- a title (the name or title by which the dataset is known),
- a publisher (the name of the entity that holds the dataset),
- a publication date (the year when the dataset was or will be made publicly available) and the type of resource you are describing.

Why it is important to manage Research Data ... properly



http://libguides.ucd.ie/data/why_manage

FAIR principles



Findable

Accessible

Interoperable

Reusable

This pyramid can function as a roadmap for the development of better data management processes. (This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).) <https://www.elsevier.com/connect/10-aspects-of-highly-effective-research-data>

European mandates

Horizon2020 already mandates OA to all scientific publications.

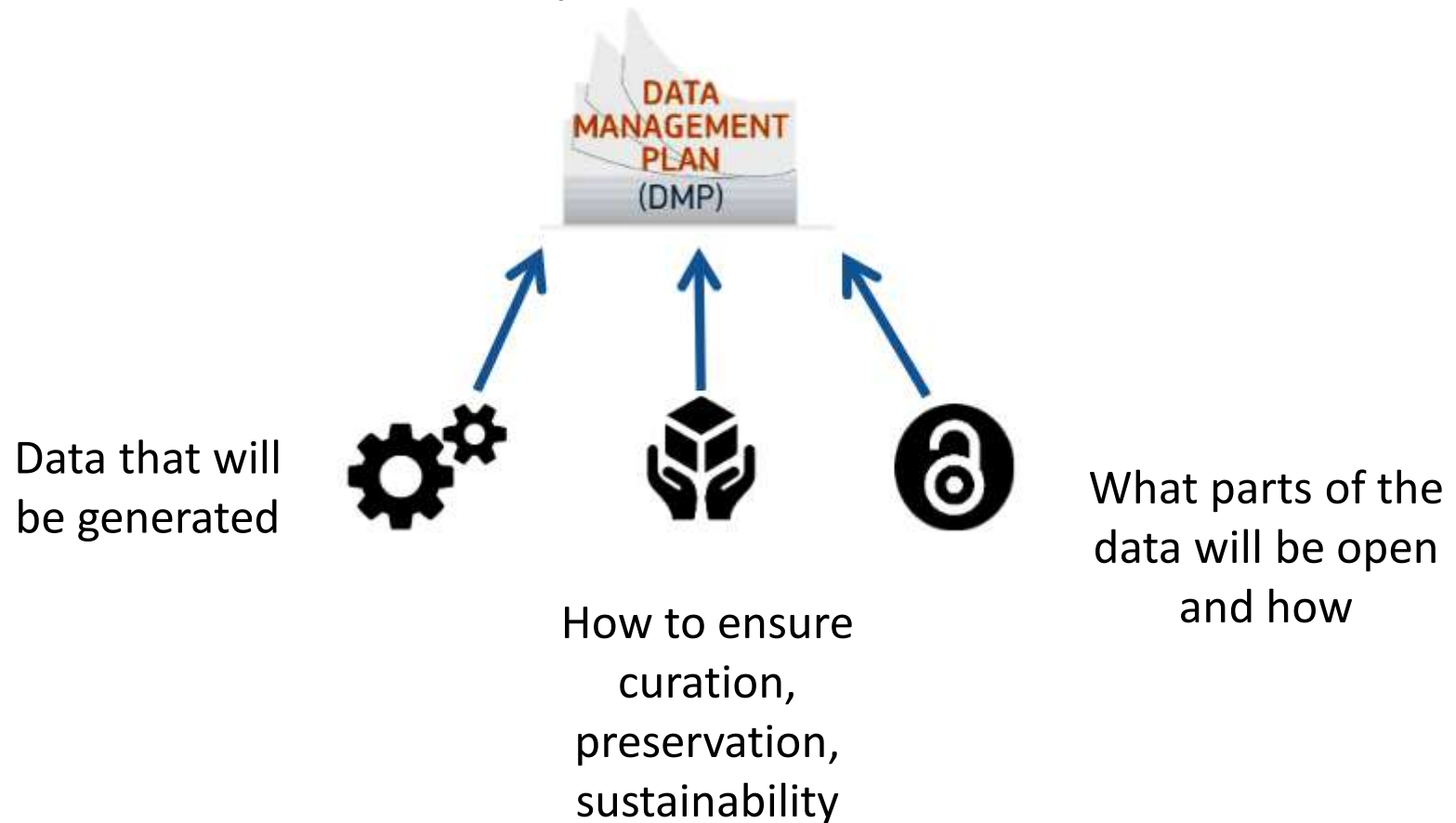
From 2017 research data is open by default with possibilities to opt out.



As open as possible, as closed necessary

Data management plan

Projects must have:





Access, use & reuse: basic aspects

Before collecting data

- prepare informed consents and give information about research, data sharing and preservation

After collecting data

- protect identities, anonymize data, regulate access where needed

File formats and transformation

- chose open, well-documented and non-proprietary formats wherever possible

Storage and security for long-term preservation

- Good practice should guarantee that data remains authentic, reliable and usable while maintaining its integrity

Which repository for my data?

To decide if you can trust a repository you can look for those that have received a Trusted Digital Repositories (TDR) certification.



re3data.org is a register of research data repositories that lists and describes more than 1,500 repositories that are currently active, such as [ZENODO](https://zenodo.org), a repository created by CERN for the EU project [OpenAIRE](https://openaire.eu)



The UniPD Library System is developing a **new Research Data Repository** for storing the datasets generated or collected during a research project: ResearchData@unipd.it. The prototype is currently being tested.





Tips about Data

Scholarly Communication and Principles of Open Science (Moodle SBA)

<https://elearning.unipd.it/sba/course/view.php?id=21>

About Publishing

<http://bibliotecadigitale.cab.unipd.it/en/about-publishing-new>

Need Help? The UNIPD Library Helpline

<http://bibliotecadigitale.cab.unipd.it/en/helpline>



Useful links

Science Information life cycle, UCLA Libraries

https://uclalibrary.github.io/find_science_info_tutorial/web_files/index.html

Creative Commons - Tutorial

<https://creativecommons.org/choose/>

WoS Training

http://thomsonreuters.com/products_services/science/training/wos/

Scopus Tutorials

https://service.elsevier.com/app/answers/detail/a_id/14799/supporthub/scopus/#search1

Publish or Perish (Google scholar)

<http://www.harzing.com/pop.htm>



Credits

These slides are a reworking of :

Scientific communication and research : evaluation Bibliometrics and Bibliometric Indicators, by Roberta Sato (PHD School in Biosciences: Information literacy in Biology 2016)

Scientific publications, introduction to bibliometrics and Open Access, by Elisa Rubino and Maria Cristina Vettore (PHD School in Statistics 2016)

Strategie e opportunità per la ricerca: Open Access, valutazione scientifica e supporto alla pubblicazione, by Emanuela Canepa (27 gennaio 2017)

Open access and scholarly communication, by Antonella De Robbio (PHD Summerschool 2018)



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<http://www.slideshare.net/LivUniLibrary/introduction-to-open-access-59722824>

Open Access to Scholarly Literature: Which Side Are You On?, by Jill Cirasella
<http://tinyurl.com/OAwhichside>

What is open access?, Dutch National website <http://openaccess.nl/en/what-is-open-access>

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<http://libraries.mit.edu/scholarly/publishing/>



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THANK YOU FOR YOUR ATTENTION

