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Hi, I am Paola!
I am a data scientist, Open Science advocate and independent researcher at IGDORE

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Institute for Globally Distributed Open Research and Education

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Let's get to know each other a bit!

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Open Science Principles and Research Data

University of Maribor
Open Science Summer School
11th September 2023

Picture

[...] there is a need for a vigorous and informed democratic debate on the production and use of scientific knowledge.

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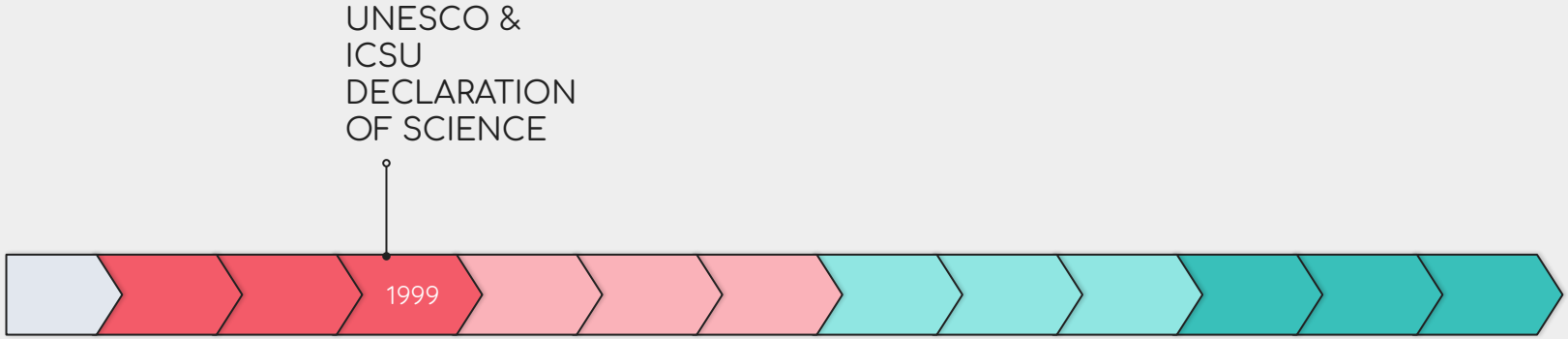
Enhancing the role of science for a more [...] sustainable world requires the long-term commitment of all stakeholders [...] through [...] the appropriate review of investment priorities, and the sharing of scientific knowledge.

it's been a long journey



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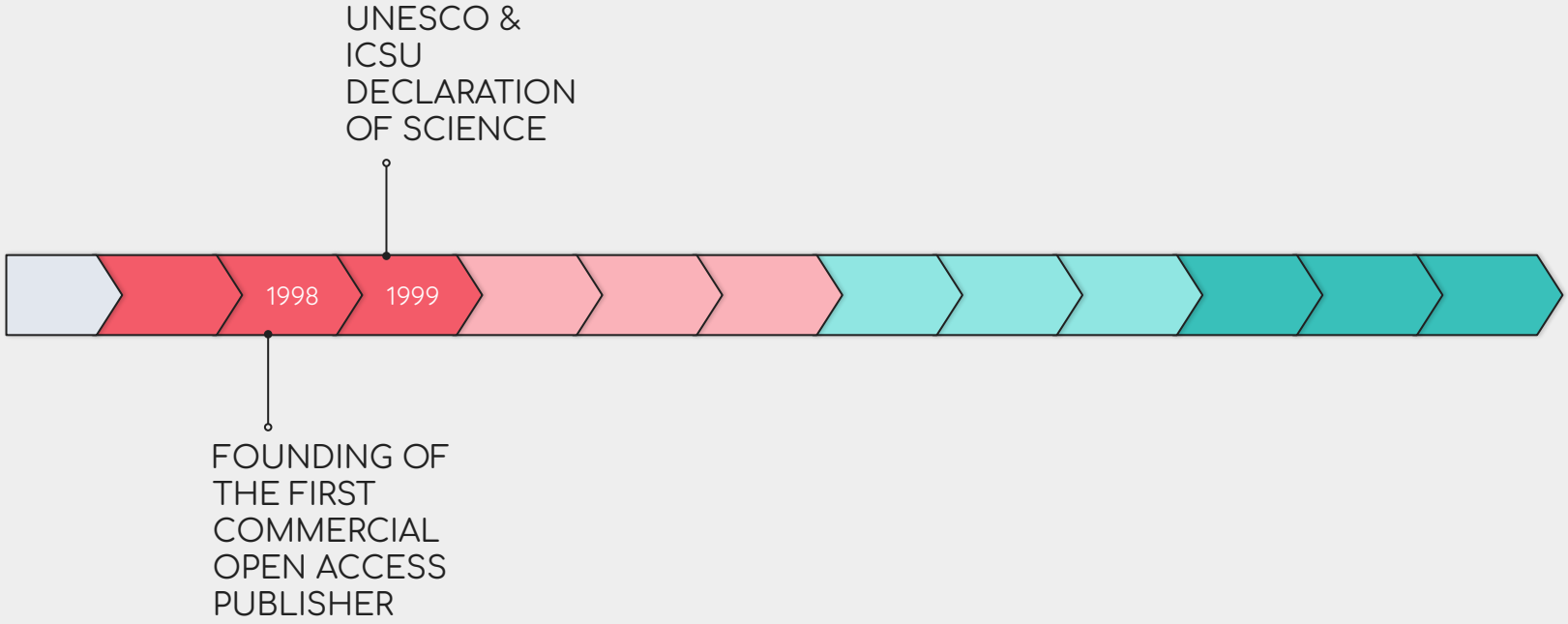

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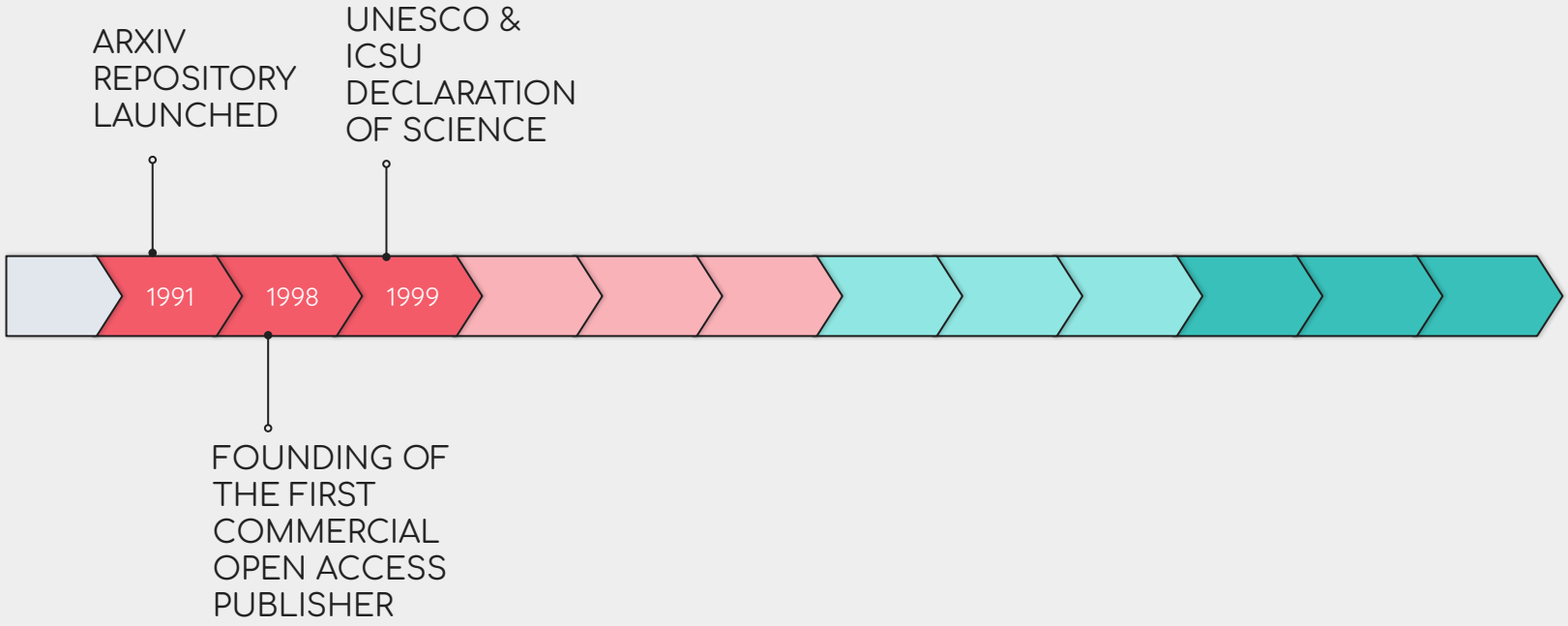

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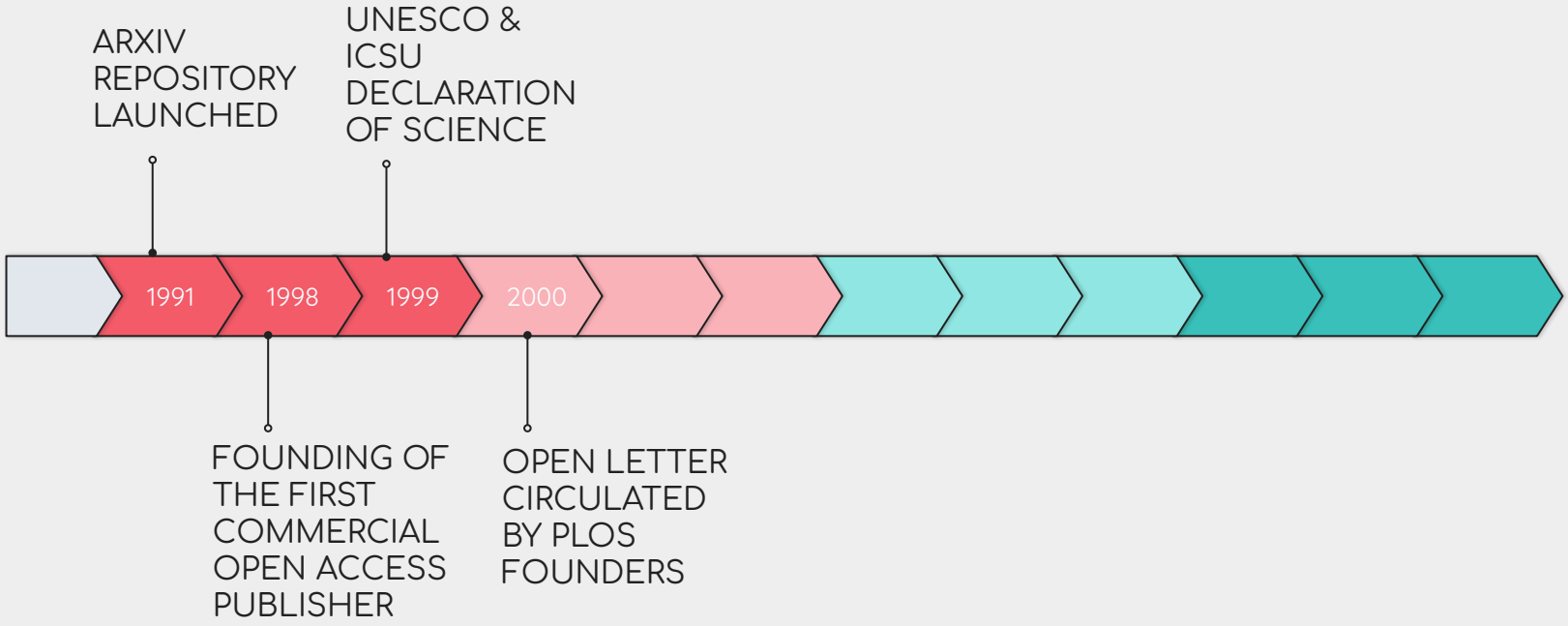

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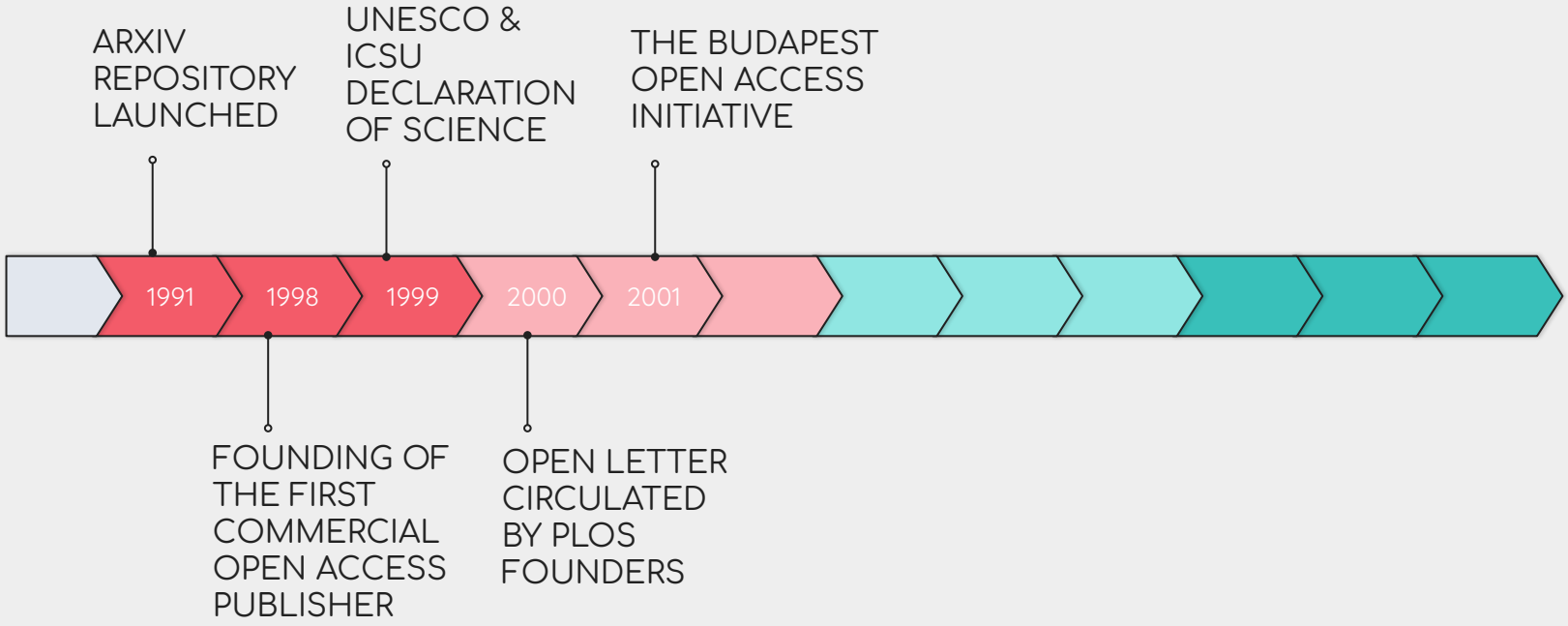

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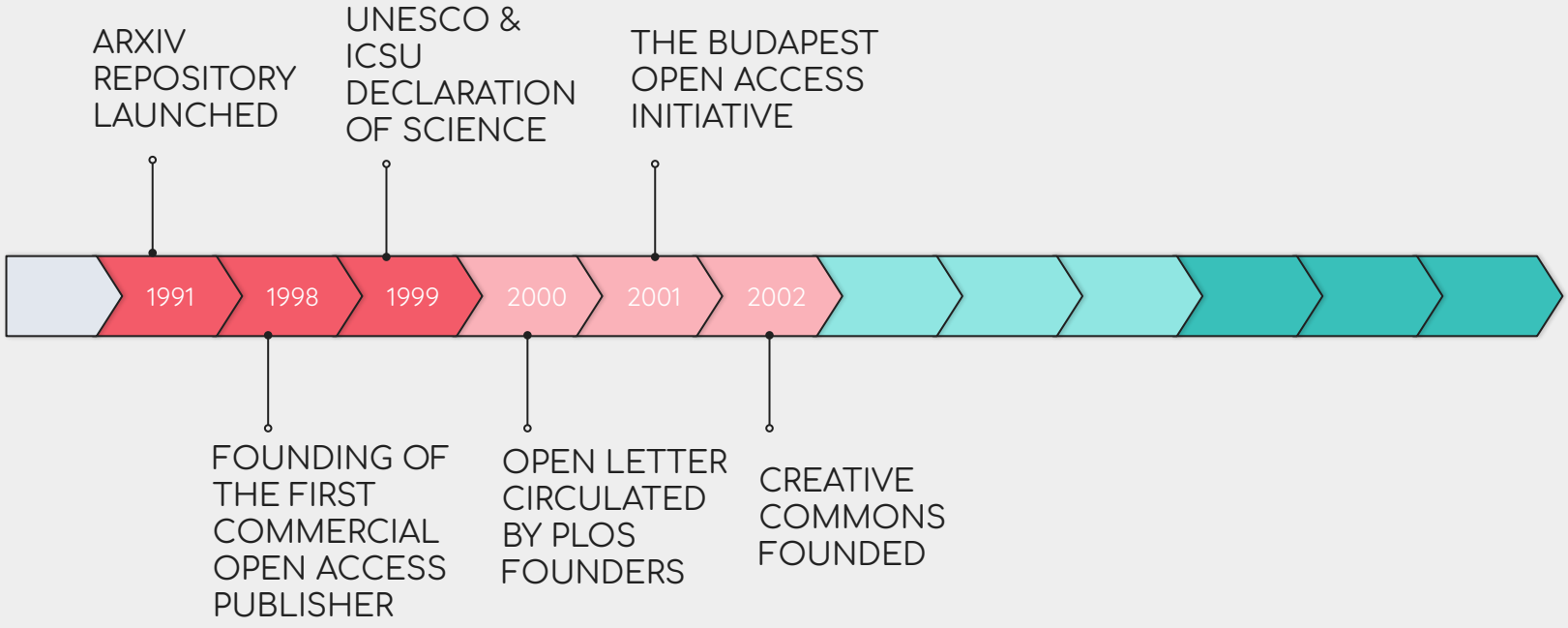

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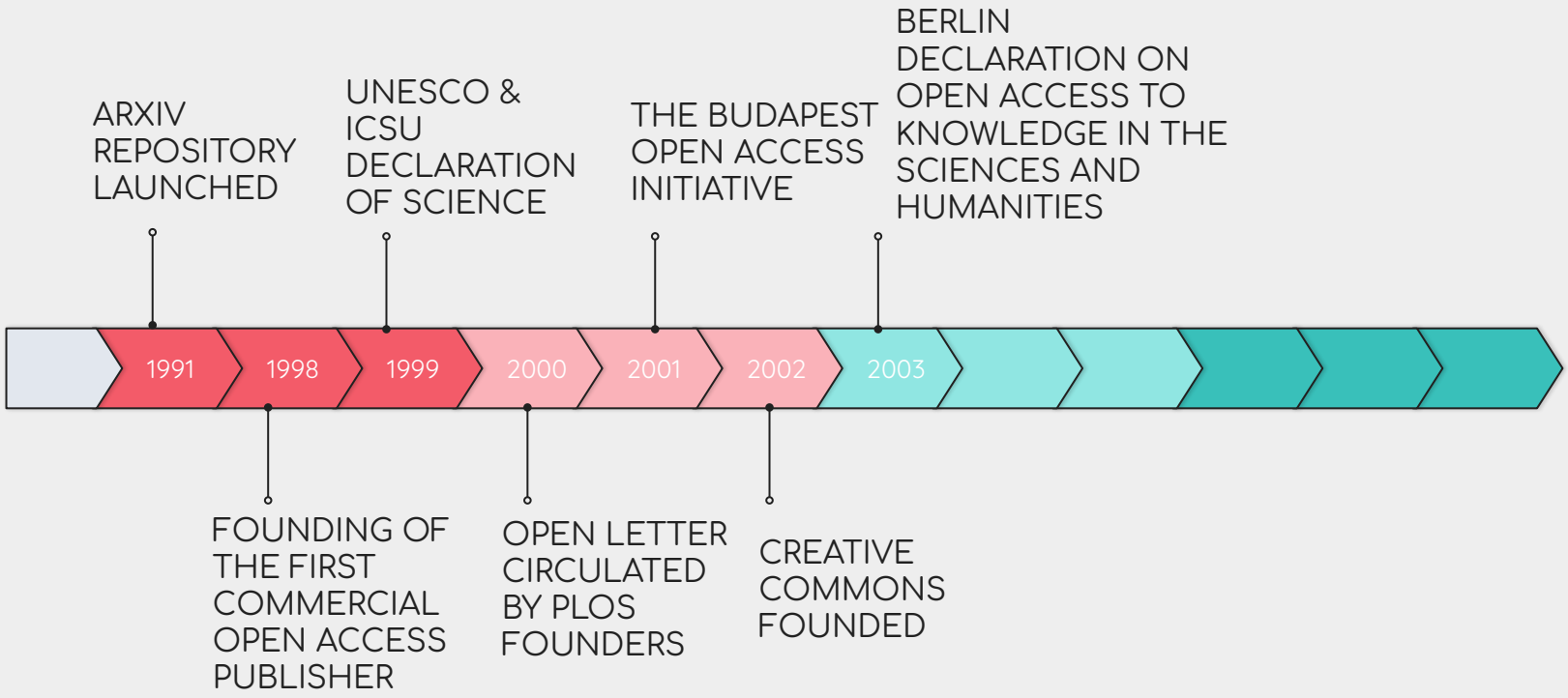

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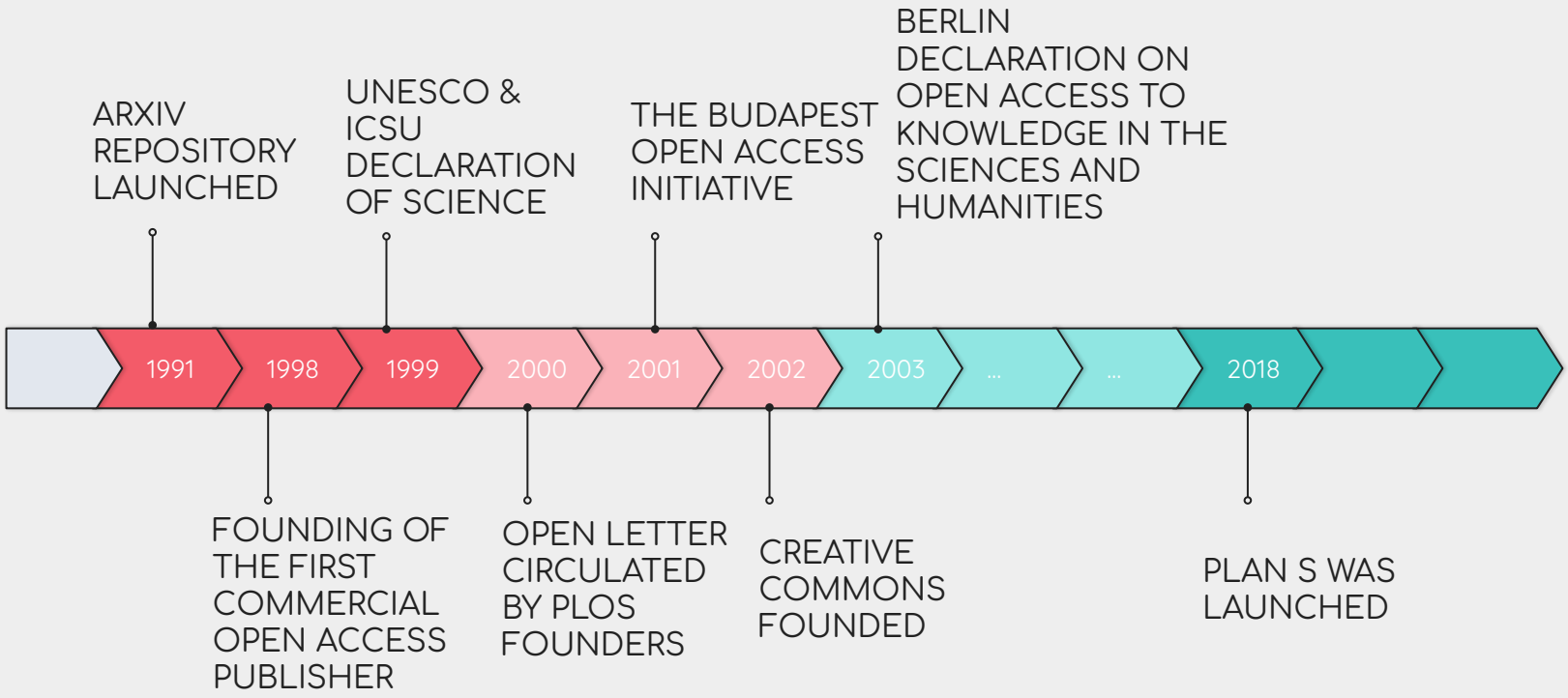

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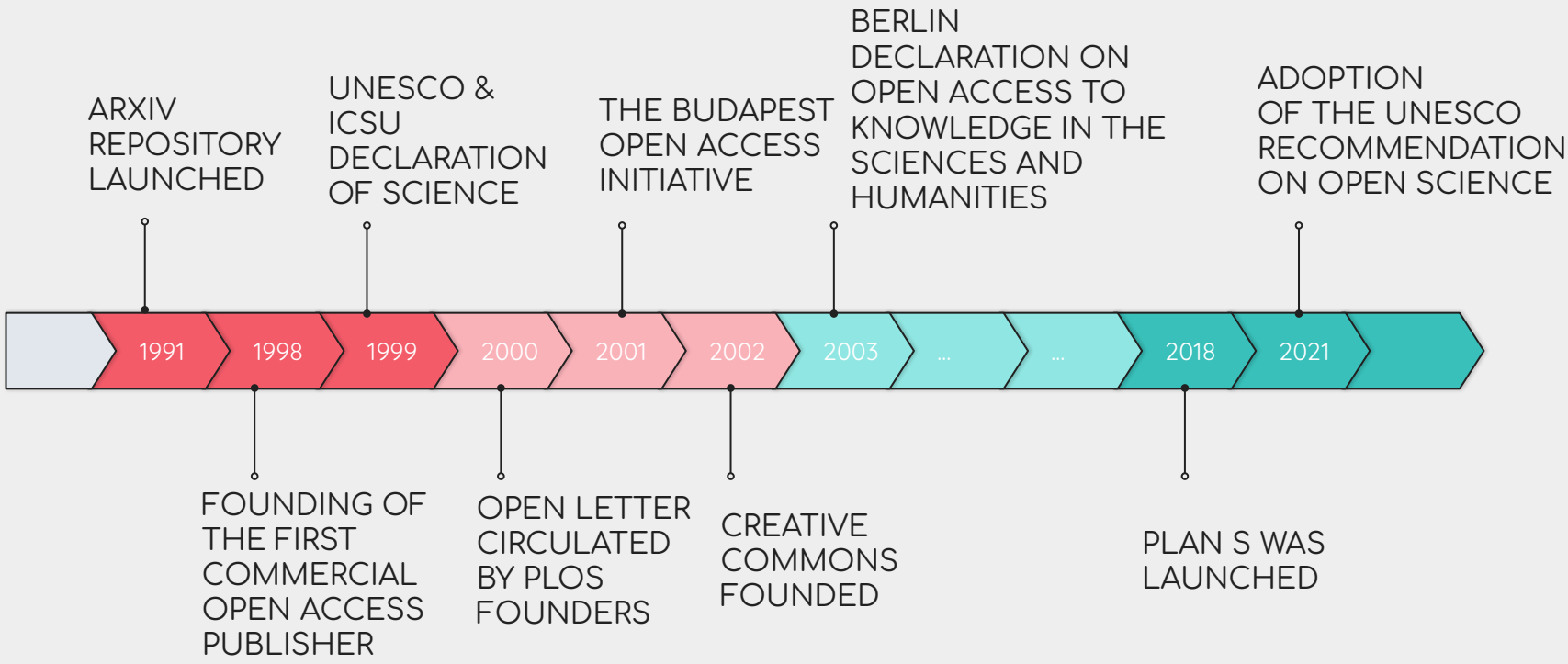
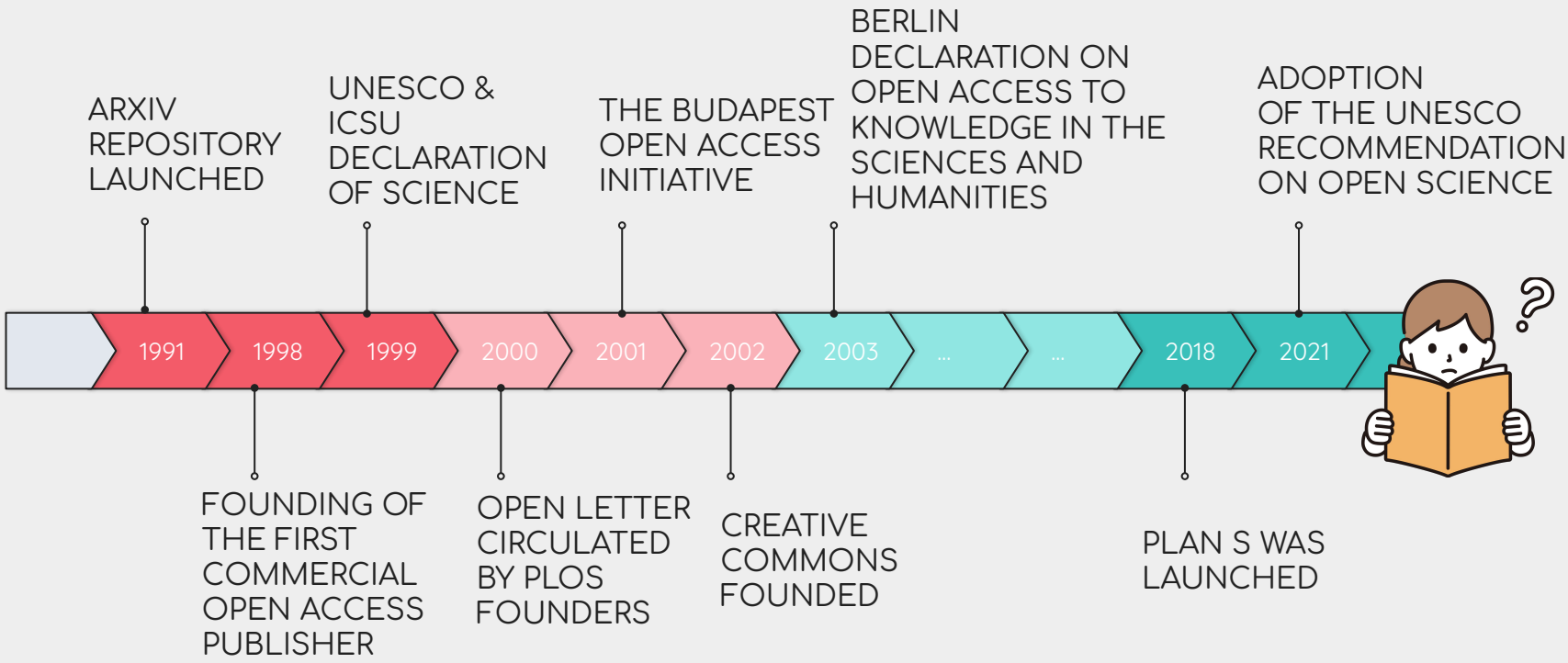


what is the future holding?



A COMMON UNDERSTANDING OF OPEN SCIENCE

RESTORING THE ETHOS OF SCIENCE

OPEN ACCESS PRACTICES

OPEN & FAIR RESEARCH DATA

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Picture: mine :)

open science: one term, five schools of thought

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public school

the public (citizens) cannot access scientific knowledge

https://link.springer.com/chapter/10.1007/978-3-319-00026-8_2

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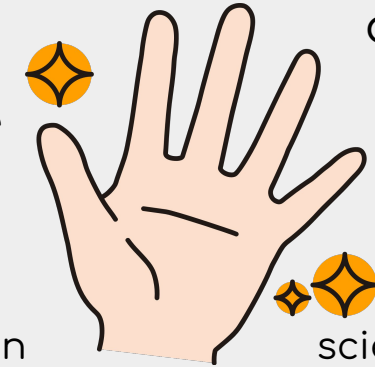

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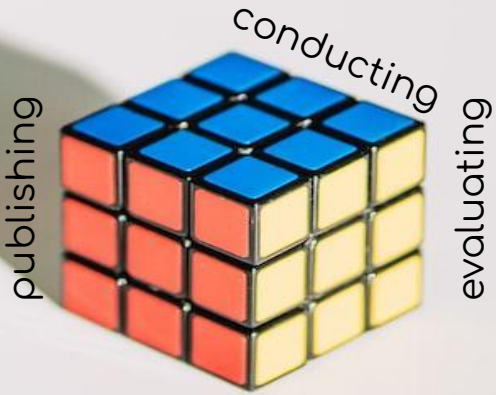
a more open and participatory way of conducting, publishing and evaluating scholarly research

central to this is the goal of increasing cooperation and transparency in all research stages

open science leads to more robust scientific results, to more efficient research and (faster) access to scientific results for everyone

this generates bigger societal and economic impact



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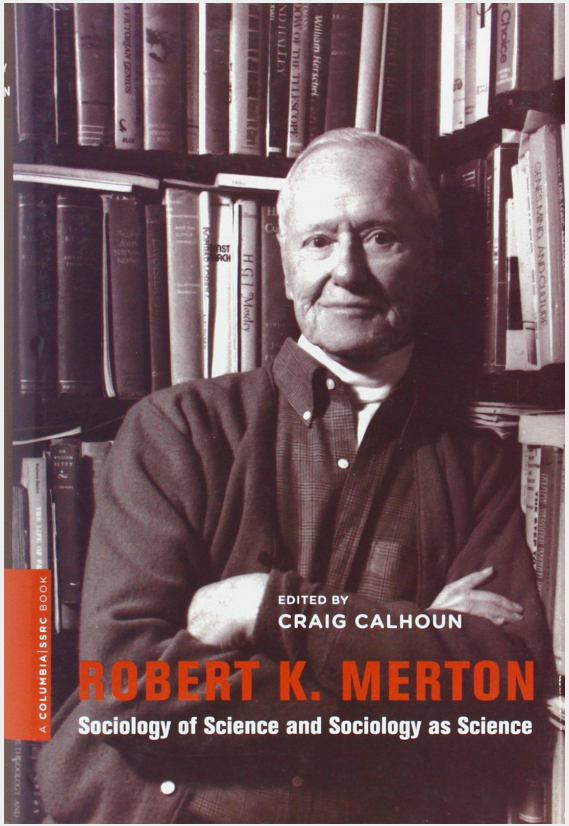
the normative structure of science



Robert K Merton, the Normative Structure of Science, 1942

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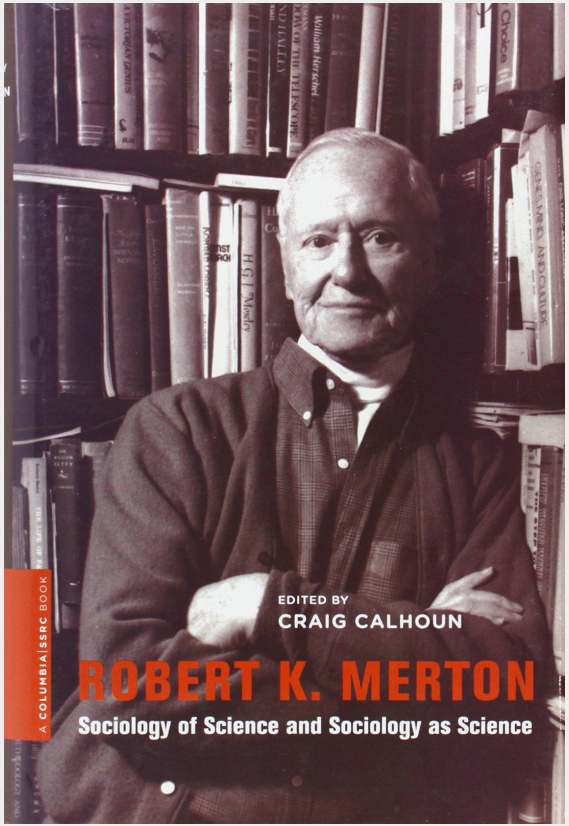

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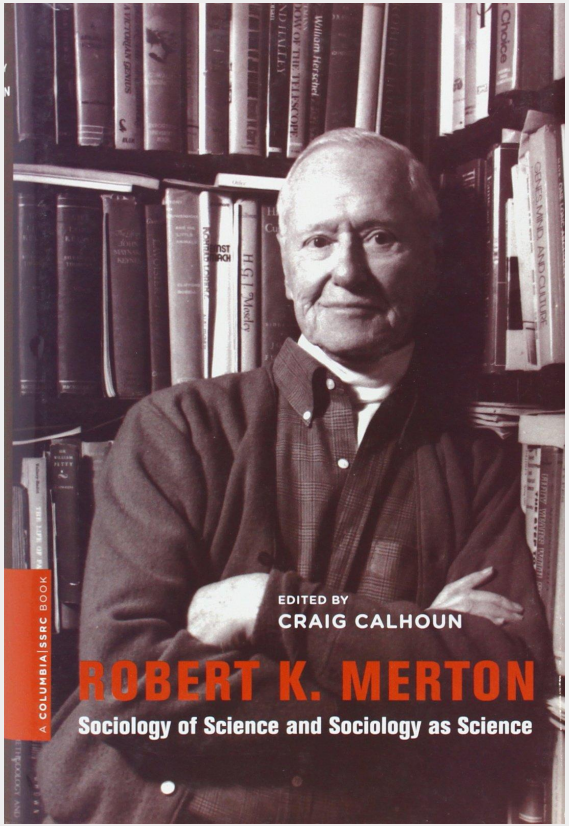

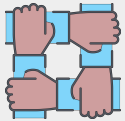

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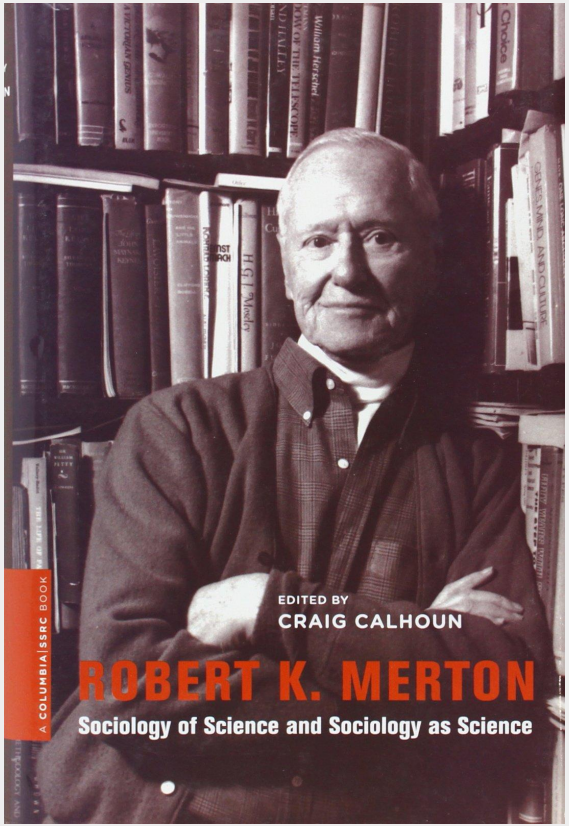

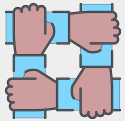

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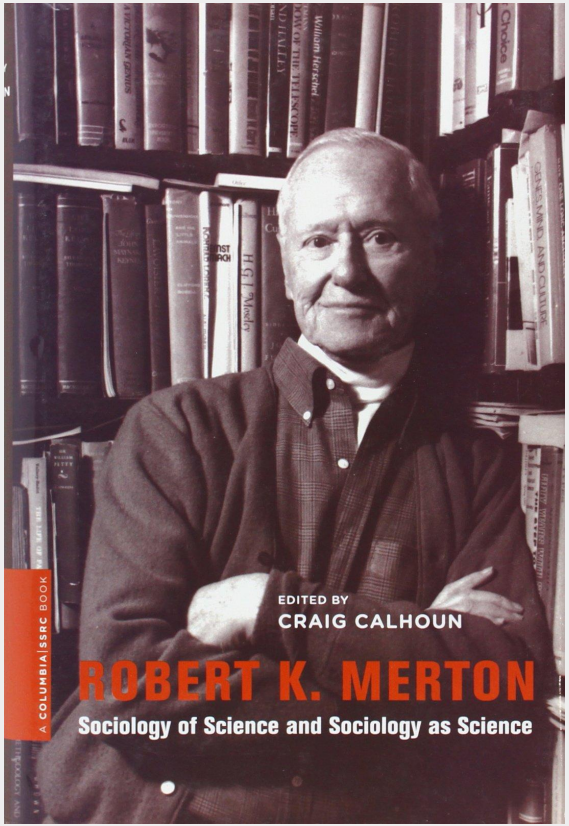

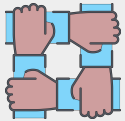

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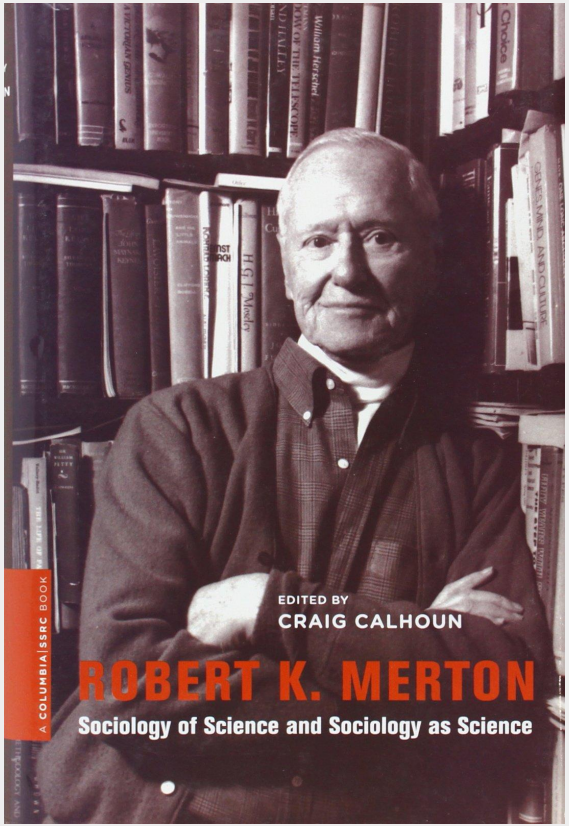

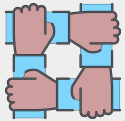

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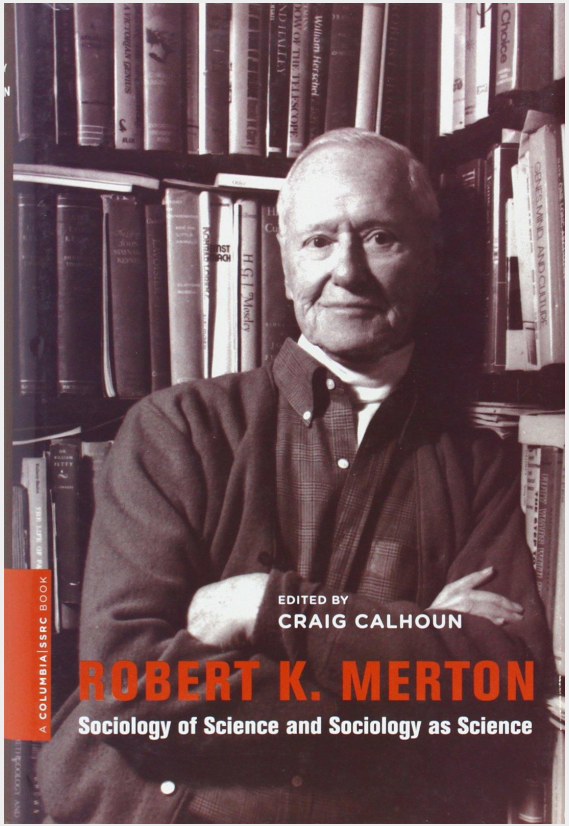
the ethos of science: on its values and norms



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secrecy
particularism
self-interest
dogmatism

Picture

upside down: a completely different set of values

serial crisis
(chronic increase of
subscription costs)

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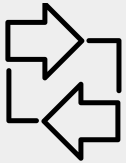

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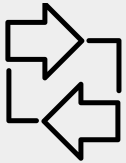

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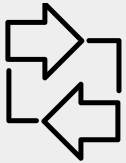

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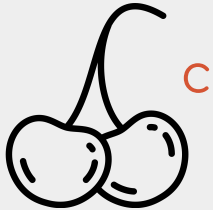

cherry-picking sexy results

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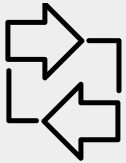

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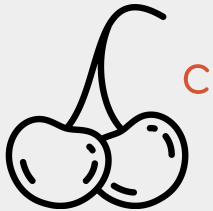

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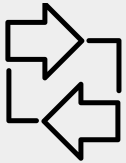

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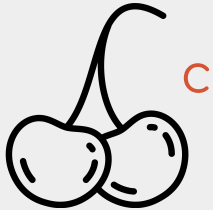

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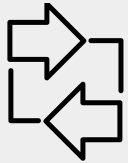

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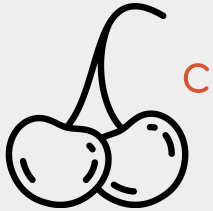

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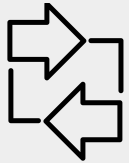

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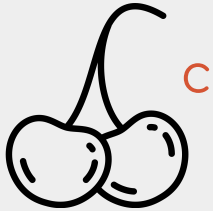

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the rhetoric of research excellence

- the holy grail of academic life (Michèle Lamont)

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- a word we have chosen to avoid having a difficult conversation, a conversation about *values* (Cameron Neylon)

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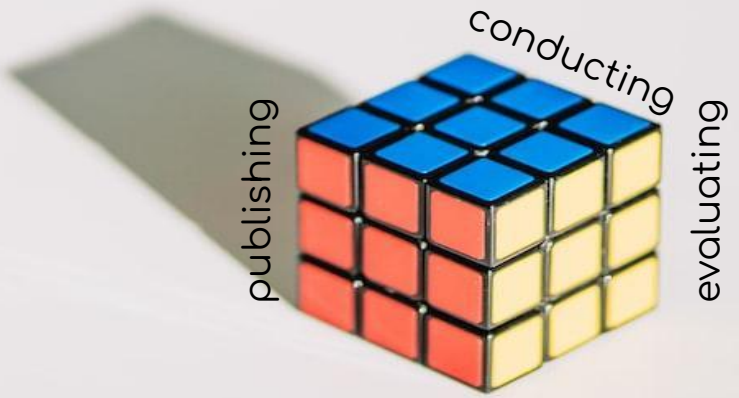
- used in its current unqualified form, research excellence is a pernicious and *dangerous rhetoric* that undermines the very foundations of good research and scholarship (Moore *et al.*)
- a neo-colonial agenda that reinforces *systemic biases in power structures*, reduces diversity, and *excludes* many participants from the processes of scholarship (Cameron Neylon)

it’s not only about those three axes



Picture

it's also about a transition to renewed values

redefine assessment of research impact

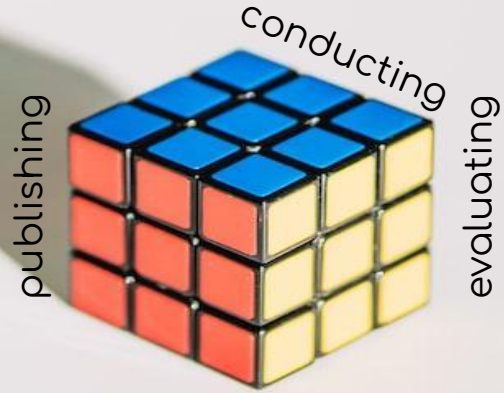
respect traditions and diversity of research groups and disciplines

invest in community-driven tools and initiatives

redefine research excellence towards value

respect and nourish personal and institutional values

recognize that papers are not the only units of scientific knowledge



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open science is definitely an umbrella term

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https://unesdoc.unesco.org/ark:/48223/pf0000383323

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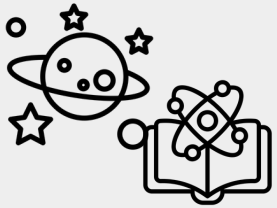
the “traditional” production of scientific knowledge

governments and institutions allocate public funds for research



researchers conduct the research

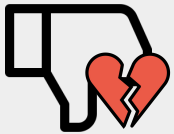
the results obtained are summarized in an article and subjected to peer review

the article is accepted, the authors transfer the copyright to the journal

published articles are locked behind paywalls

libraries pay for journal subscriptions, or the public pays to read individual articles

even after paying to read, people are granted little or no reuse permission



all in all, very slow scientific progress and poor return on investment

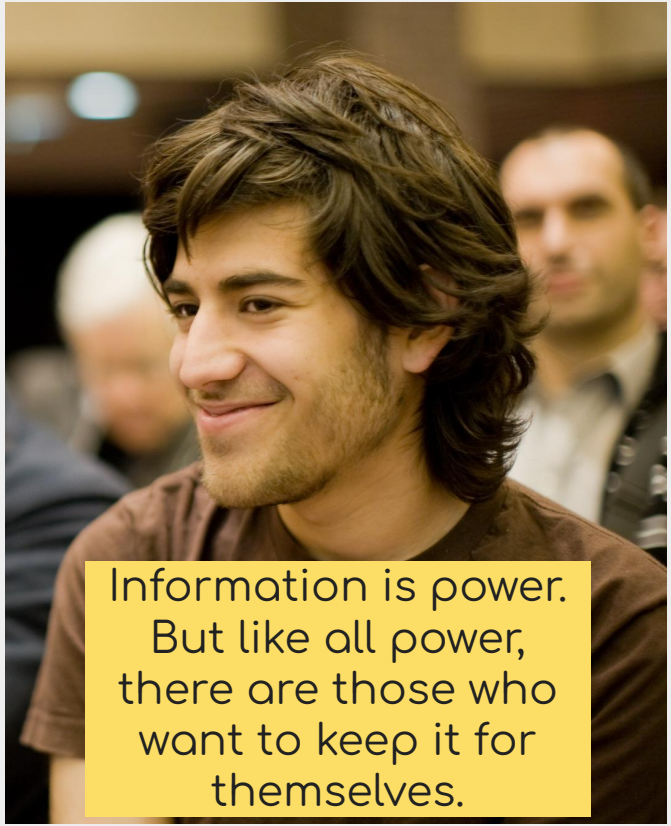
Plcture

BUDAPEST OPEN ACCESS INITIATIVE - 2001

Photo: Lesliekwchan - Own work, CC BY-SA 4.0; https://www.budapestopenaccessinitiative.org/read/

Guerilla Open Access Manifesto

by Aaron Swartz



Aaron Swartz, 1986-2013

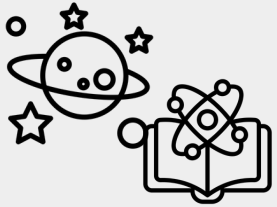
The [R]evolution of Open Science

Jonathan Tennant

Jon Tennant, 1988-2020

the open access way

governments and institutions allocate public funds for research



researchers conduct the research

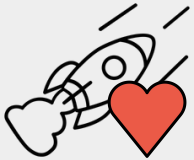
the results obtained are summarized in an article and subjected to peer review

the article is accepted, the publication policy ensures deposit in an open archive

the articles can still be published on traditional journals (embargoes)

the public can download articles from open repositories

the public is granted full reuse rights under open licenses



acceleration of scientific progress and optimal return on public investment

Picture

fifty shades of open access

Toll-access on the publisher page, but there is a free copy in an OA repository.

green

https://peerj.com/articles/4375/#p-7

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bronze

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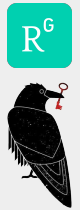
closed



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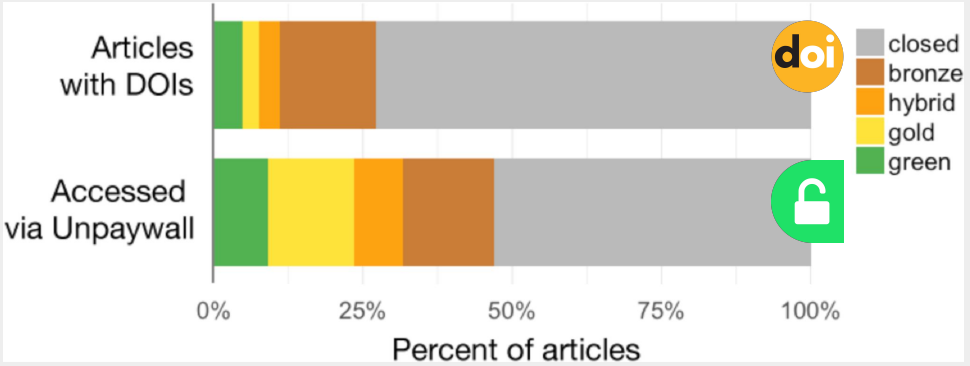

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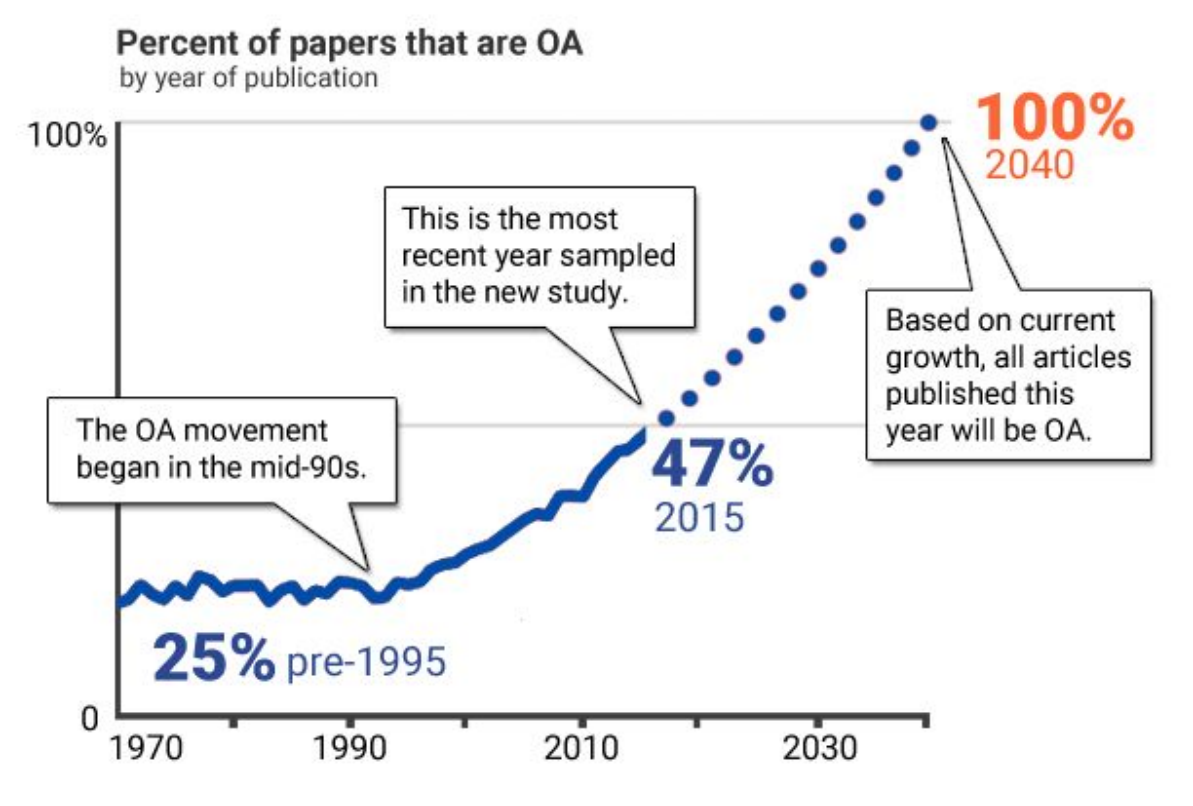
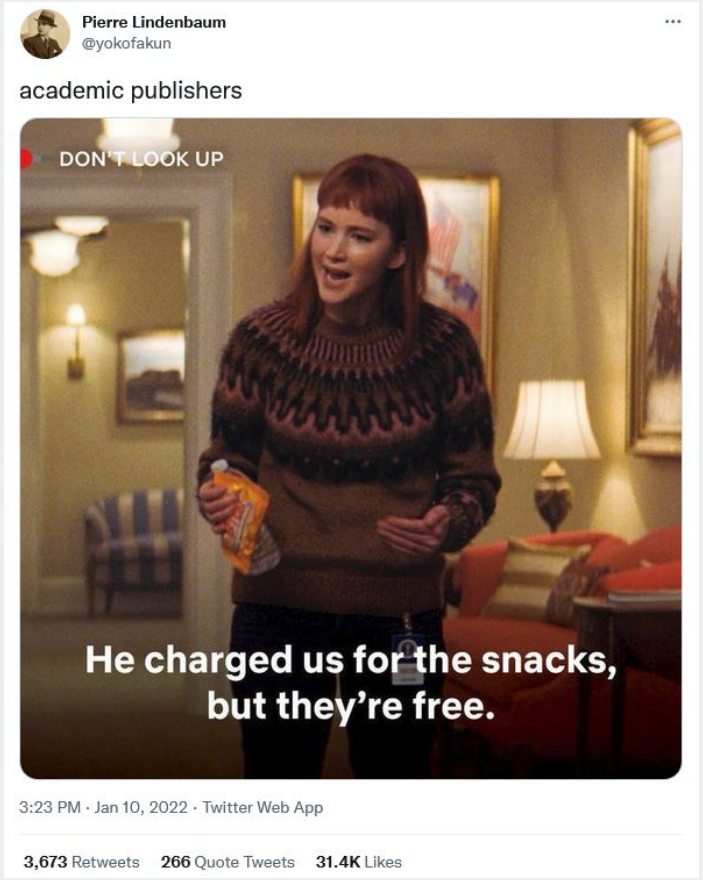
https://peerj.com/articles/4375/#p-7

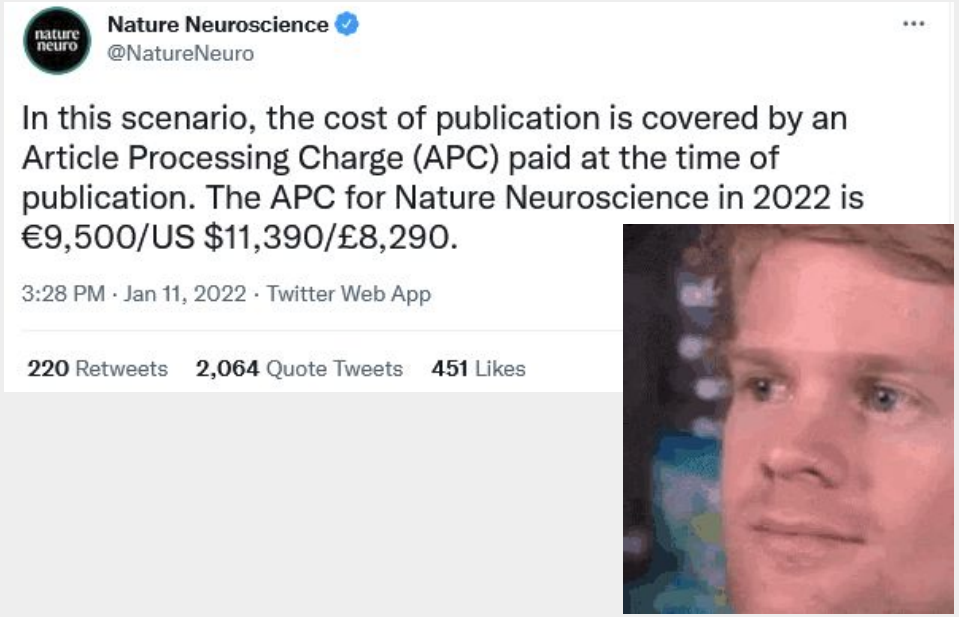
still 17 years to go for full open access?



https://impactstory.wordpress.com/2018/02/22/oa-by-when/

is academic publishing just for the rich?





is academic publishing just for the rich?

Pierre Lindenbaum
@yokofakun

academic publishers

3:23 PM · Jan 10, 2022 · Twitter Web App

3,673 Retweets **266** Quote Tweets **31.4K** Likes

Nature Neuroscience
@NatureNeuro

In this scenario, the cost of publication is covered by an Article Processing Charge (APC) paid at the time of publication. The APC for Nature Neuroscience in 2022 is €9,500/US $11,390/£8,290.

3:28 PM · Jan 11, 2022 · Twitter Web App

220 Retweets **2,064** Quote Tweets **451** Likes

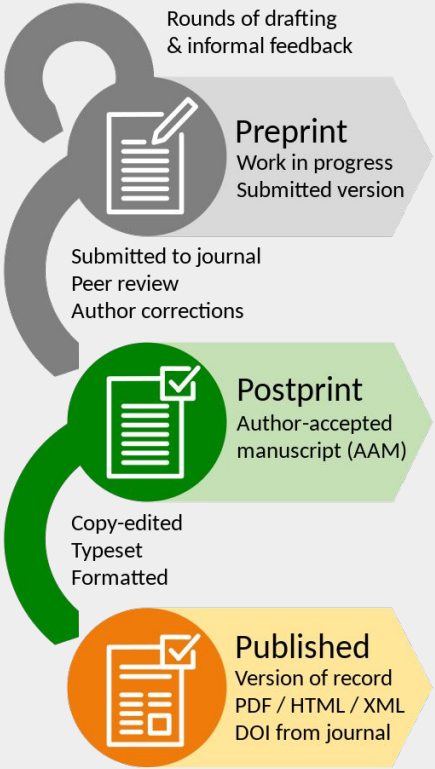
DOAJ

13,347
JOURNALS
WITHOUT APCs

19,755
JOURNALS

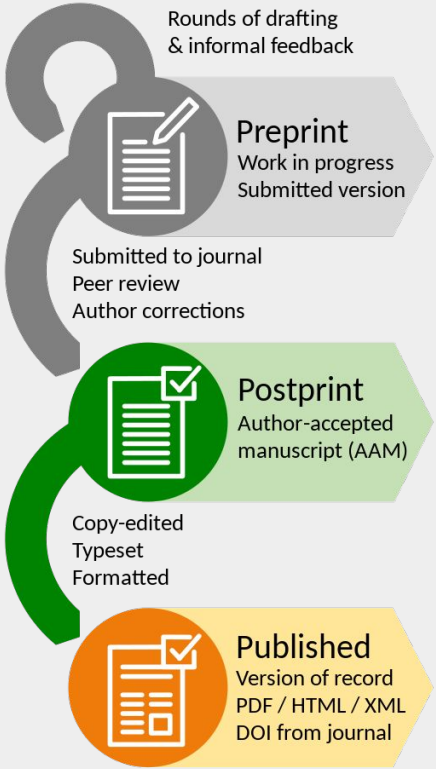
9,158,579
ARTICLE
RECORDS

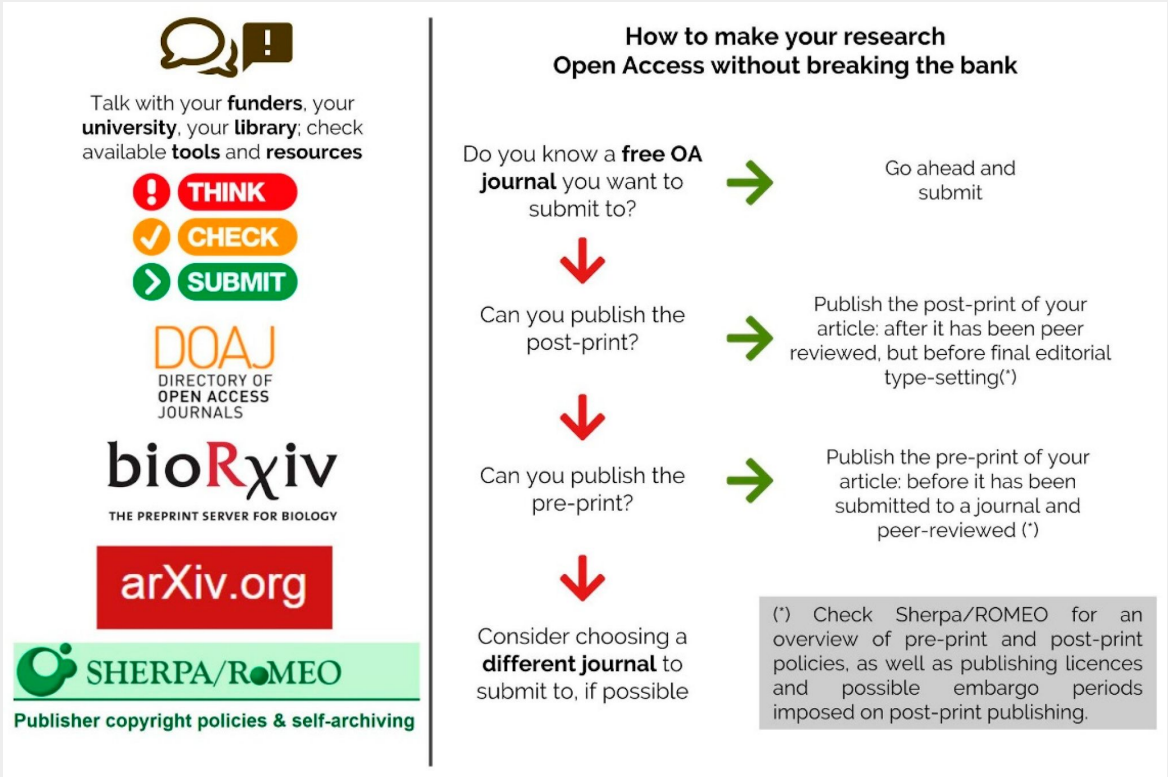
open access doesn't have to break the bank



Picture: Thomas Shafee

open access doesn't have to break the bank





https://www.mdpi.com/2304-6775/7/2/34

all languages (should) matter

Languages Are Still a Major Barrier to Global Science

Tatsuya Amano, Juan P. González-Varo, William J. Sutherland

over-representation of positive and/or statistically significant results

information on local species, ecosystems, and phenomena can be overlooked

knowledge transfer problem, especially for local practitioners, policymakers, and the public at large who wants (and has all the rights) to access this knowledge

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2000933

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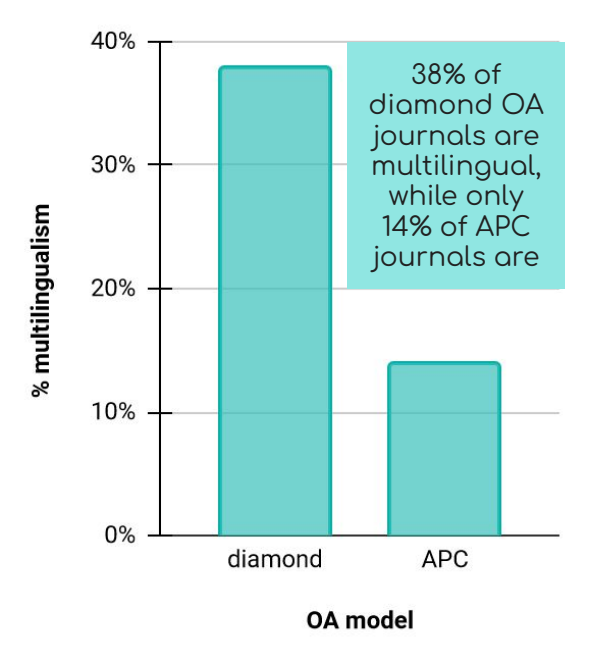

Diamond Open Access: journals and platforms do not charge fees to either authors or readers. Diamond Open Access journals are community-driven, academic-led, and academic-owned publishing initiatives.

https://zenodo.org/record/5592704 + https://zenodo.org/record/4558704#.YYMwwBrMLv1

A COMMON UNDERSTANDING OF OPEN SCIENCE

RESTORING THE ETHOS OF SCIENCE

OPEN ACCESS PRACTICES

OPEN & FAIR RESEARCH DATA

Picture

the Open Science movement encourages researchers to share research output beyond the contents of a published academic article

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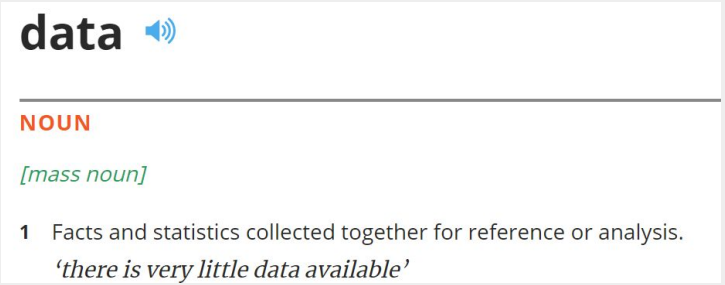


data

NOUN

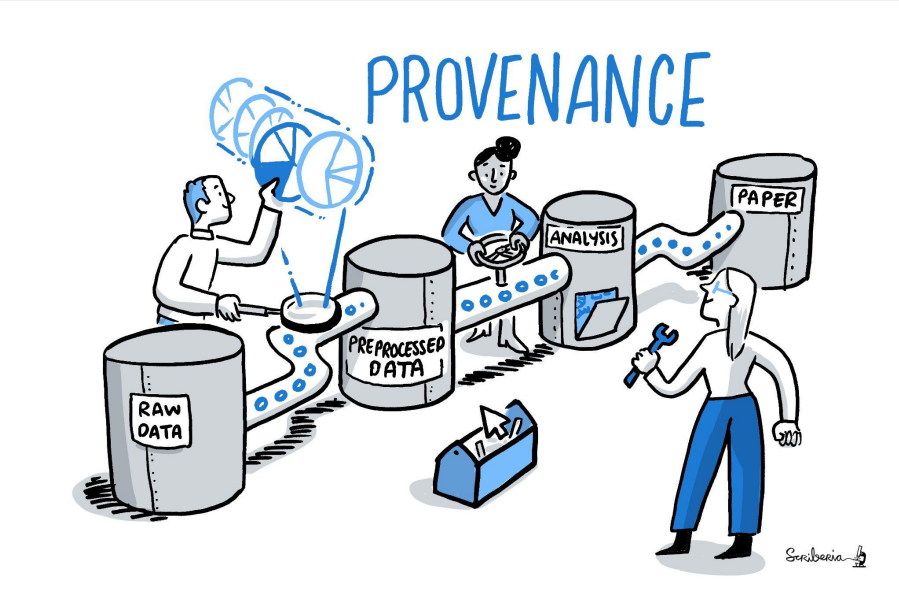
[mass noun]

1 Facts and statistics collected together for reference or analysis.
'there is very little data available'

what is research data?

Any type of information created, collected, observed, in the context of research:

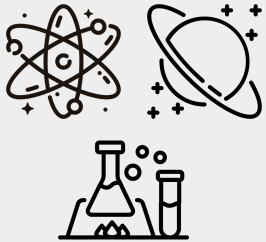
- Primary: raw data from measurements or instruments
- Secondary: processed from second-order analysis and interpretation
- Published: final format available for use and reuse
- Metadata: data about the data



Image

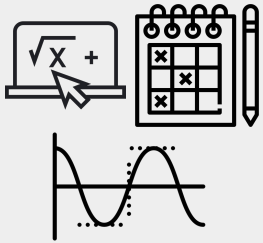
data-informed research

experiments:
empirical
science



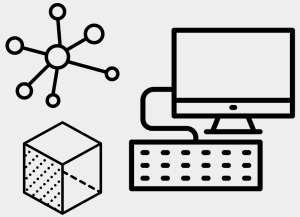
thousands
of years ago

laws:
theoretical
science



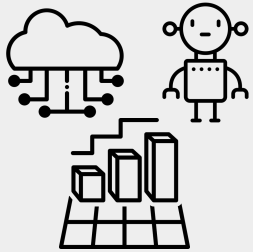
last few
hundreds
years

simulations:
computational
science



last few
decades

data:
eScience



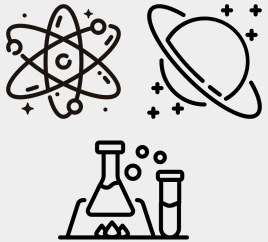
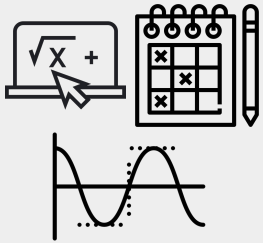
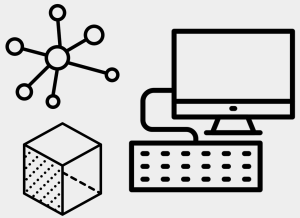
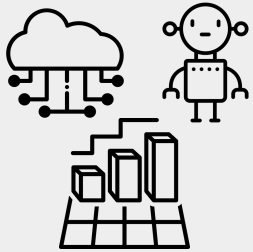
today

data-informed research

machine-readable data as substrate for knowledge discovery

reproducibility

research assessment

experiments: empirical science	laws: theoretical science	simulations: computational science	data: eScience
			
thousands of years ago	last few hundreds years	last few decades	today

without data, research is...

Non-reproducible and non-transparent

Without the availability of data to support publications, studies cannot be reproduced and independently verified

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Non-reproducible and non-transparent

Without the availability of data to support publications, studies cannot be reproduced and independently verified

Inefficient

Proper management of research data, and their sharing, allows their reuse for other scientific questions and reduces the need for duplication

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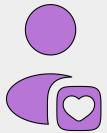
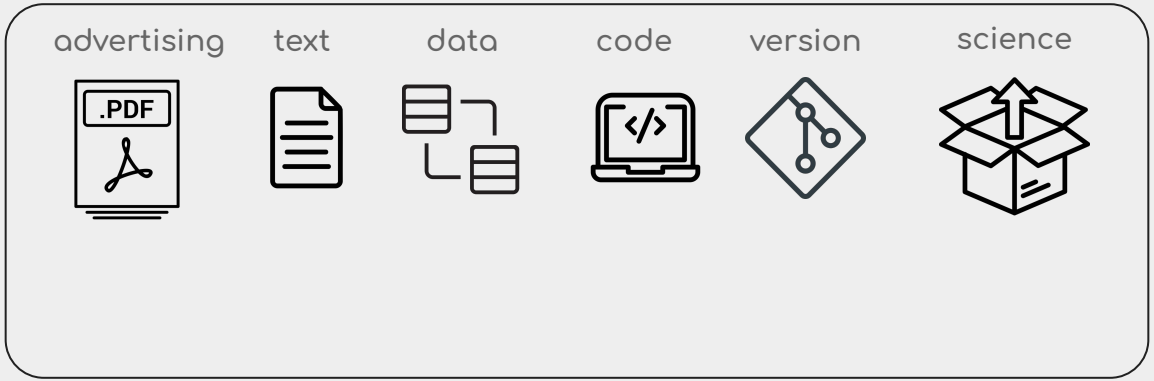
Of lower social and economic impact

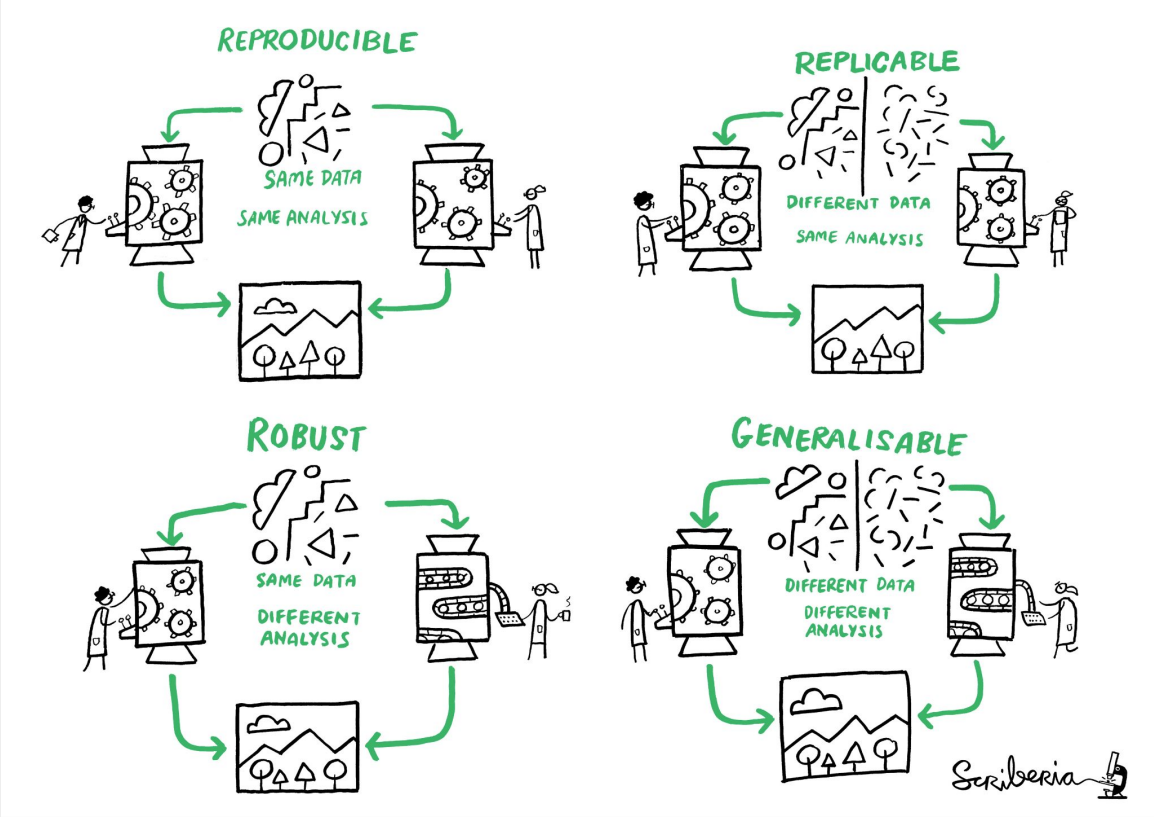
Open science multiplies the impact of research, responds to the use of public funding, contributes to collective and global well-being, and is inspired by the values of equity and inclusiveness



data: research objects on the web

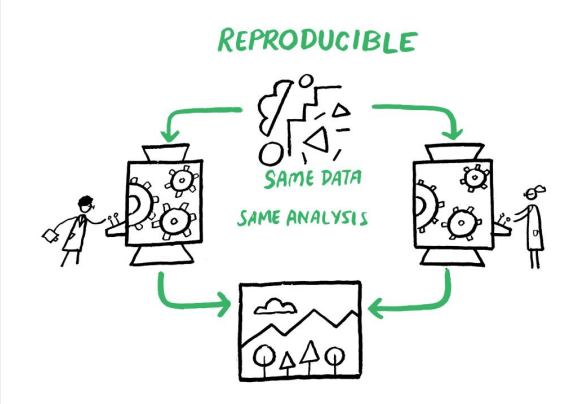


reproducibility: minimum standard for research validity



Picture

reproducibility: minimum standard for research validity



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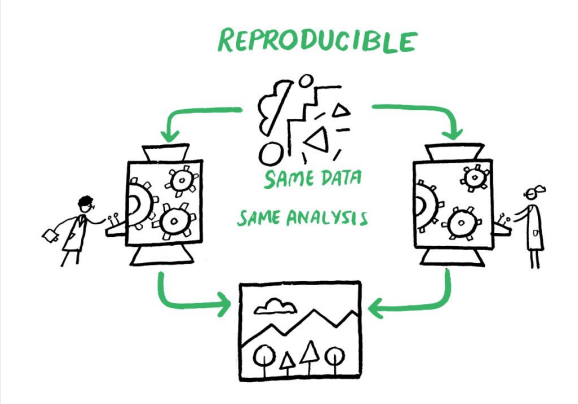
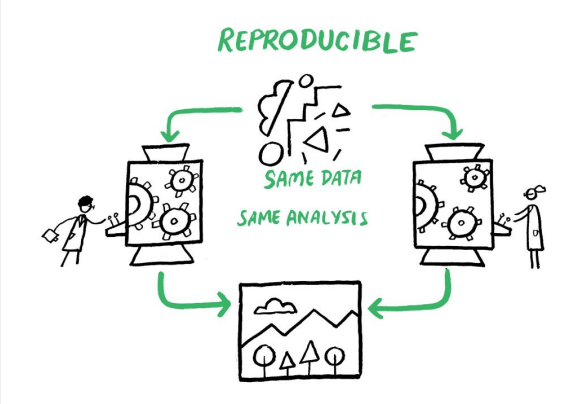
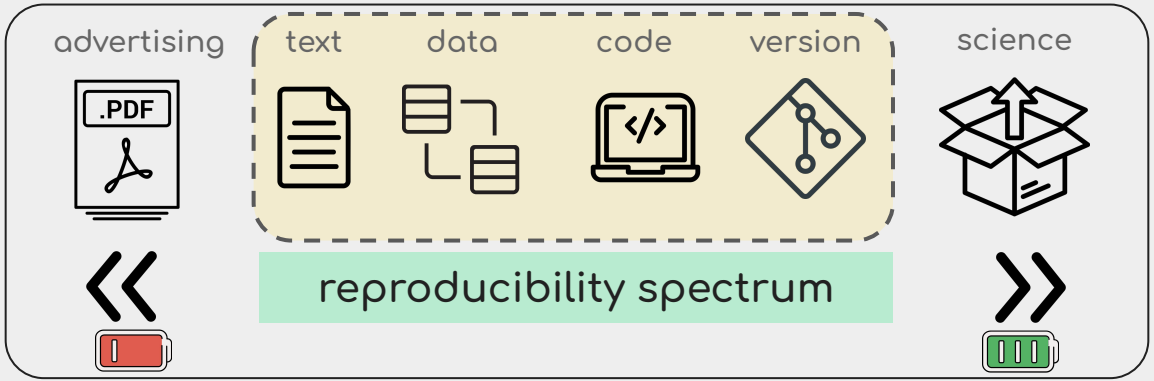
reproducibility: minimum standard for research validity



advertising text data code version science

reproducibility: minimum standard for research validity





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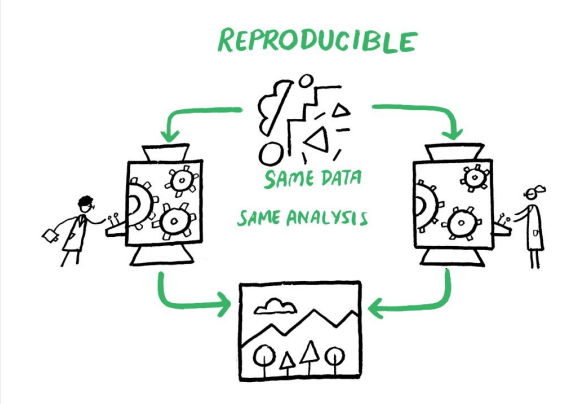
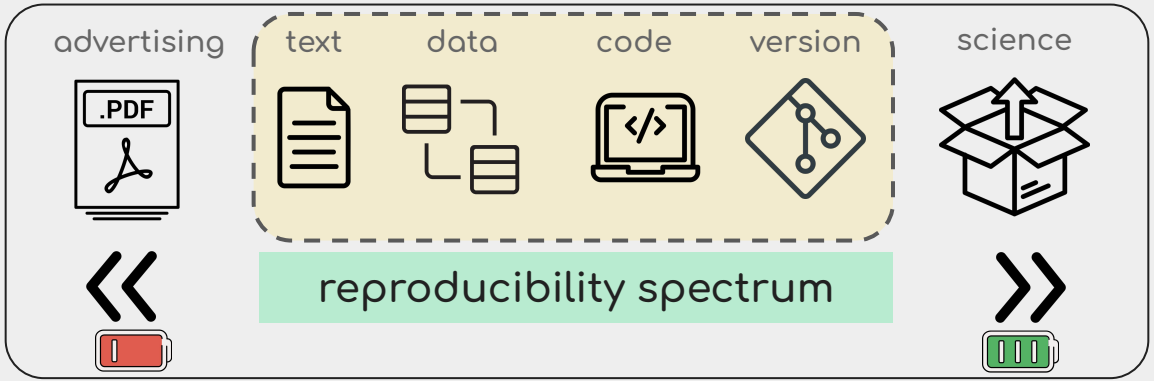
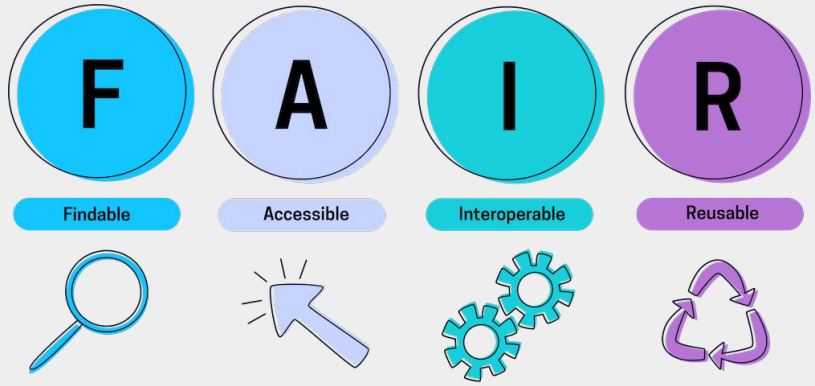


objects that belong together should be linked to each other (and other objects), so that they can be discovered on the web



the FAIR principles as guidance for data stewardship



the FAIR principles have been designed to assist discovery and reuse of research objects through the web

FAIR comes in degrees

FAIR is agnostic of technical implementations

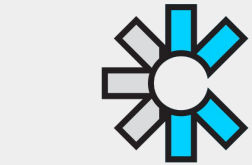
FAIR requires work!

https://www.nature.com/articles/sdata201618; https://medium.com/fluree/making-data-f-a-i-r-93629e82c459

Picture

definition of open data

Open data is data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike.



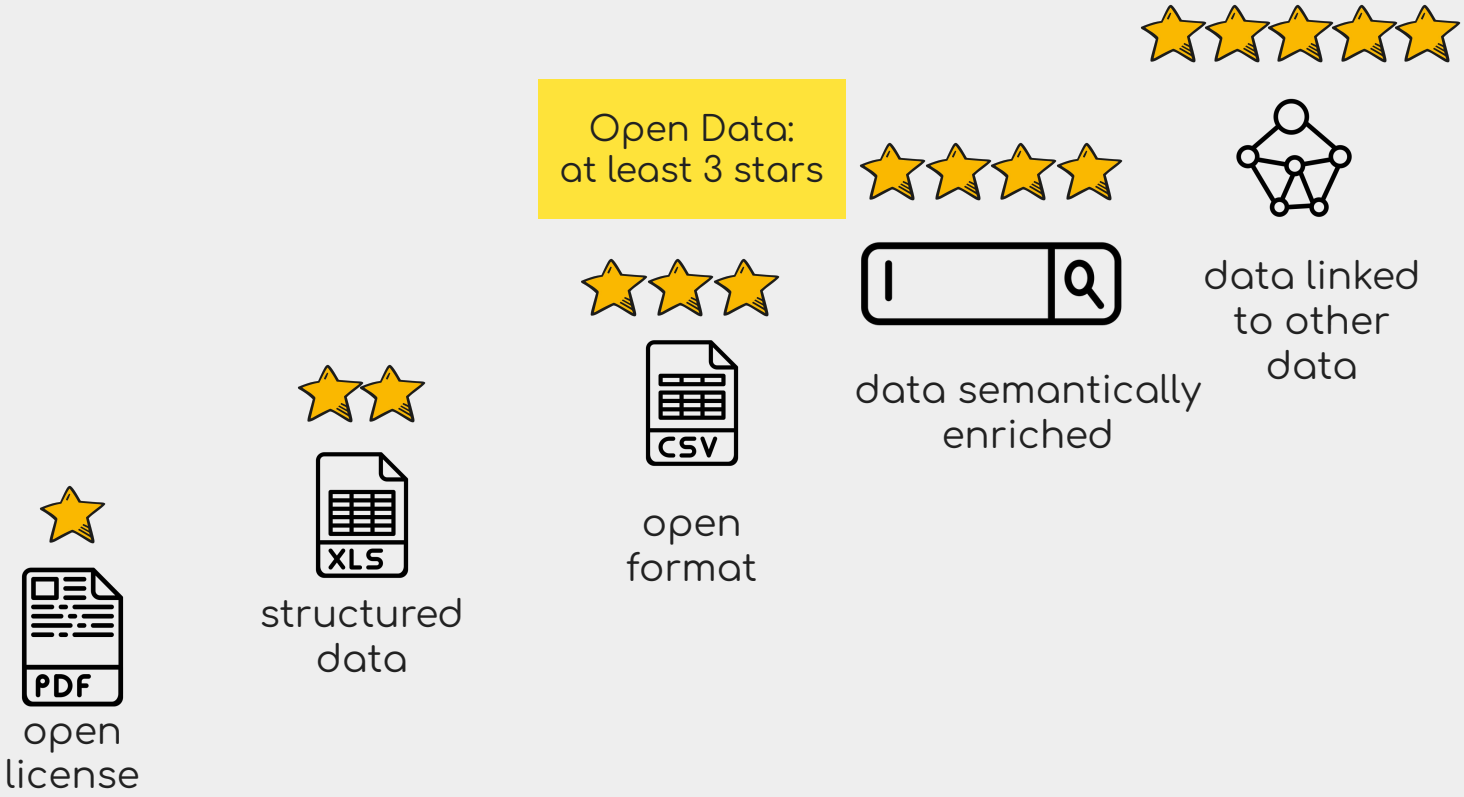
Open Knowledge Foundation

https://opendatahandbook.org/guide/en/what-is-open-data/

explaining FAIR with the 5 star open data model

https://5stardata.info/en/

explaining FAIR with the 5 star open data model



https://5stardata.info/en/

open data is not FAIR data, and vice versa

FAIR is not equivalent of OPEN, but OPEN data needs to be FAIR to be useful

Making your data freely available on the web doesn't translate to it being reusable

Even confidential and highly protected datasets can be FAIR ⇒ as open as possible, as closed as necessary

Ideally, you want FAIR data shared openly!

Dealing with FAIR data workshop, pt. I

12/09/2023 12:15 – 14:00

Venue: Čuk reading room, University of Maribor Library

Picture

7 principles on good scientific publishing

1. there should be universal open access to the record of science, both for authors and readers
2. scientific publications should carry open licenses that allow reuse and text and data mining
3. rigorous and ongoing peer review is essential to the integrity of the record of science
4. the data/observations underlying a published truth claim should be concurrently published
5. the record of science should be maintained to ensure open access by future generations
6. publication traditions of different disciplines should be respected
7. systems should adapt to new opportunities rather than embedding inflexible infrastructures

https://council.science/publications/sci-pub-report1/

We need open science to meet the challenges of our time and restore the ethos of research

We need open science to meet the challenges of our time and restore the ethos of research

Embrace incrementalism, change can happen by degrees, every little step counts

Reach out to the community

Focus on good science practices, not on social identity

THANK YOU!

Questions?
You can always email me at
paola.masuzzo@gmail.com