Institutional strategies for open science and open access: librarian's roles

2022 "WAL Spotlight"
Competence Development Program
For World Academic Librarians

International Association of University Libraries (**IATUL**)
Tsinghua University Library
The University of Hong Kong Libraries
China Academic Journals
China National Knowledge Infrastructure (**CNKI**)

J. K. Vijayakumar (Vijay)

30 Minutes Open Science
Open Access
Useful Strategies
Librarians' Role

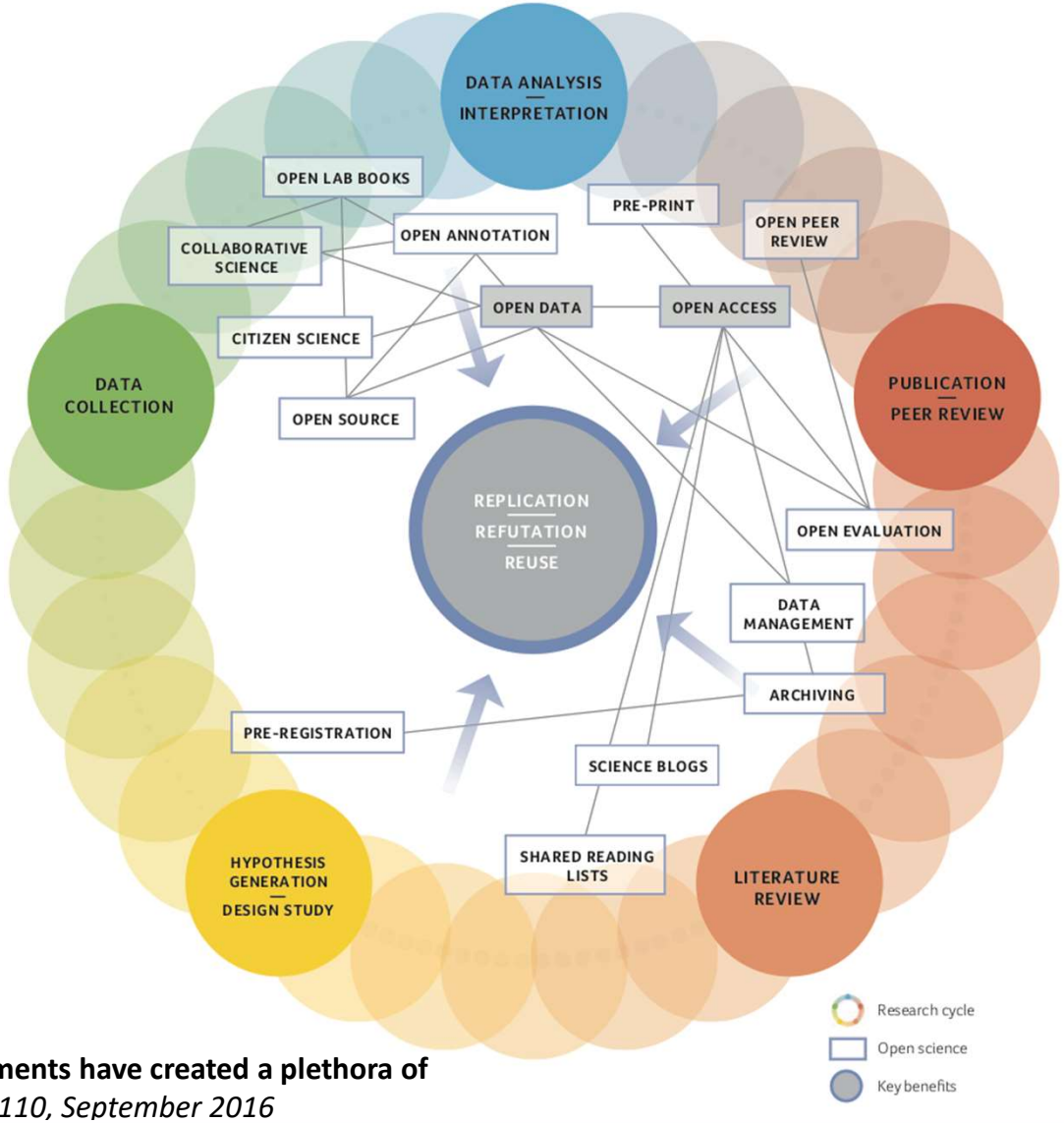
10 minutes QA
(please type your questions in Chat/QA)

SCIENTIFIC PUBLISHING

In pursuit of open science, open access is not enough

Preventing monopolies in knowledge infrastructure is the next battleground for publishers and research institutions

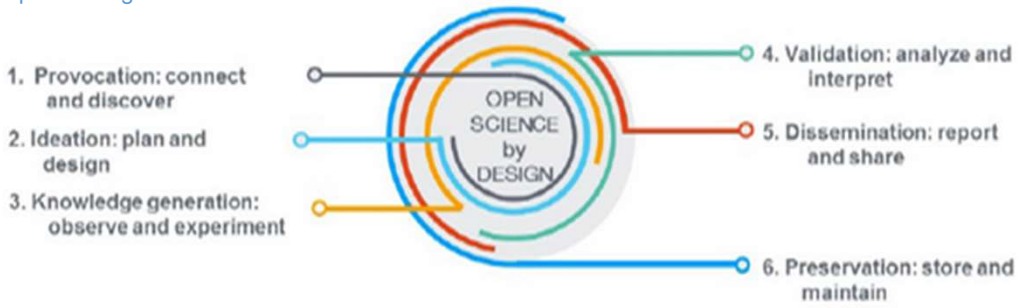
By Claudio Aspesi[1] and Amy Brand[2,3]

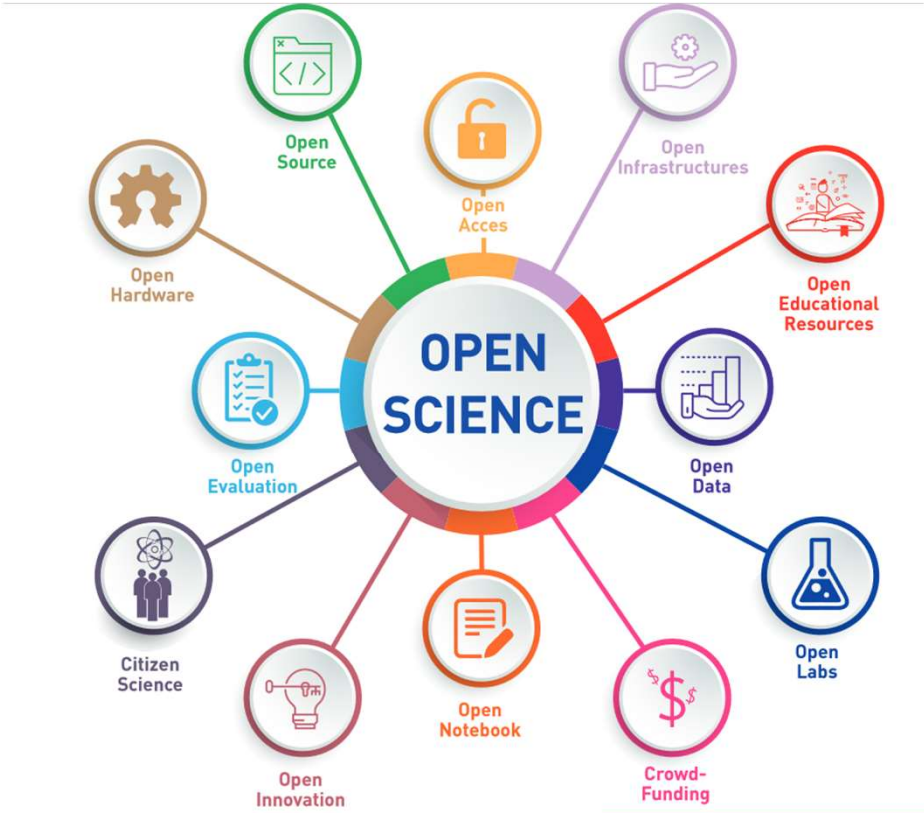


The elements of open science: Grassroots movements have created a plethora of new concepts. *Source: Daniel Saraga in Horizons 110, September 2016*

Open Science

National Academies of Sciences, Engineering, and Medicine. 201Open Science by Design: Realizing a Vision for 21st Century 8. Research. Washington, DC: The National Academies Press. https://doi.org/10.17226/25116.

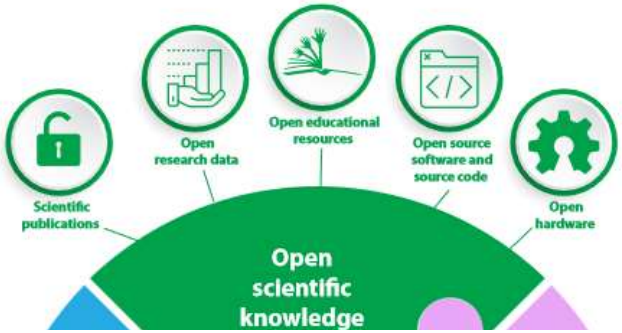


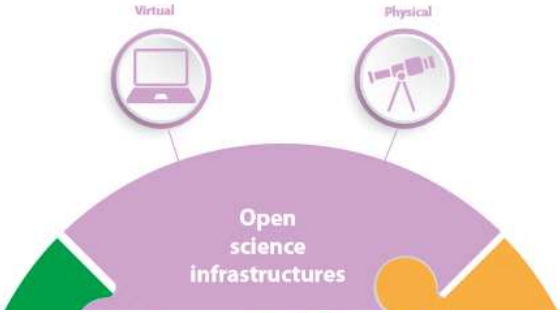


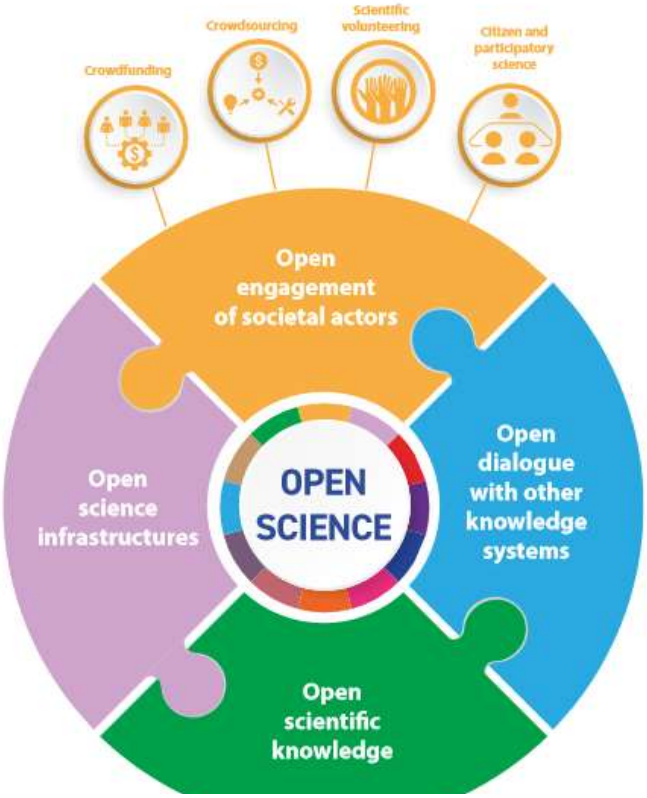
Components of Open Science

Towards a UNESCO Recommendation on Open Science

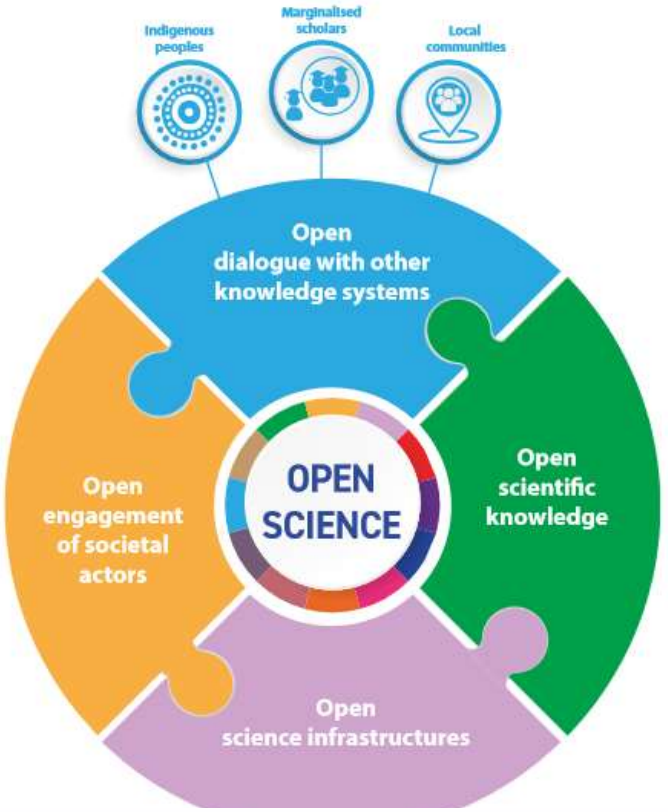
Building a Global Consensus on Open Science







United Nations Educational, Scientific and Cultural Organization



Library roles in Researcher Life Cycle

Embedding Openness as default in Research Life Cycle

Research Libraries proactively see the opportunities and embed themselves to the Research Life Cycle

Access to Resources
Literature Search Skills
Reference Management
Embedded Librarians

Funding
Proposals
Citation Profiling
RDM plans
OA plans

RDM services
Data Analysis
Data Visualization
Digital Scholarship

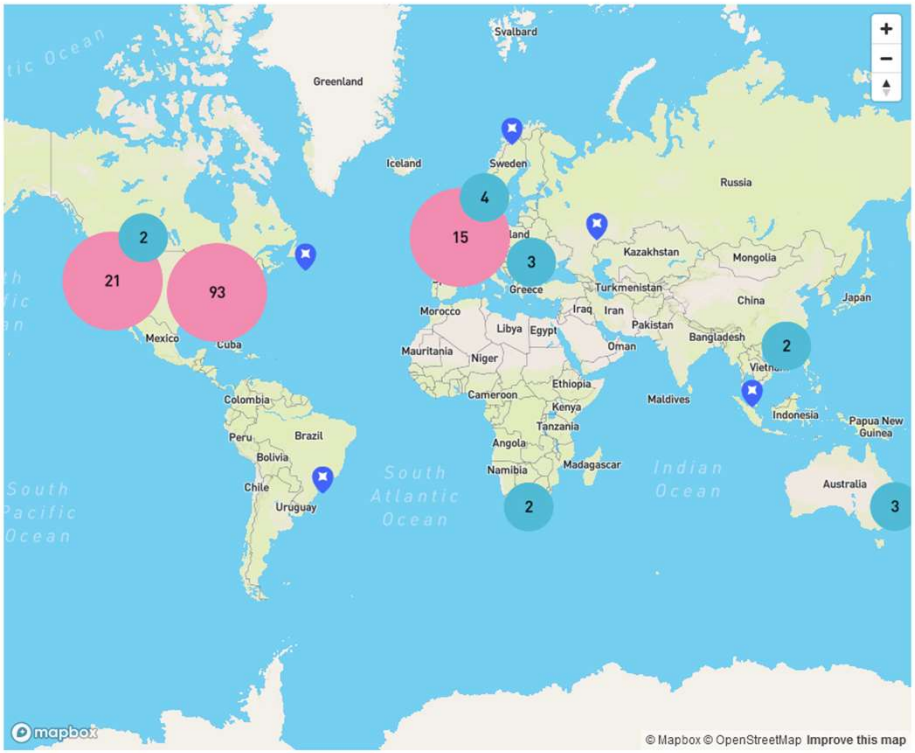
Research Writing
Open Access
Scholarly Communication

Archiving
Preservation
Repository

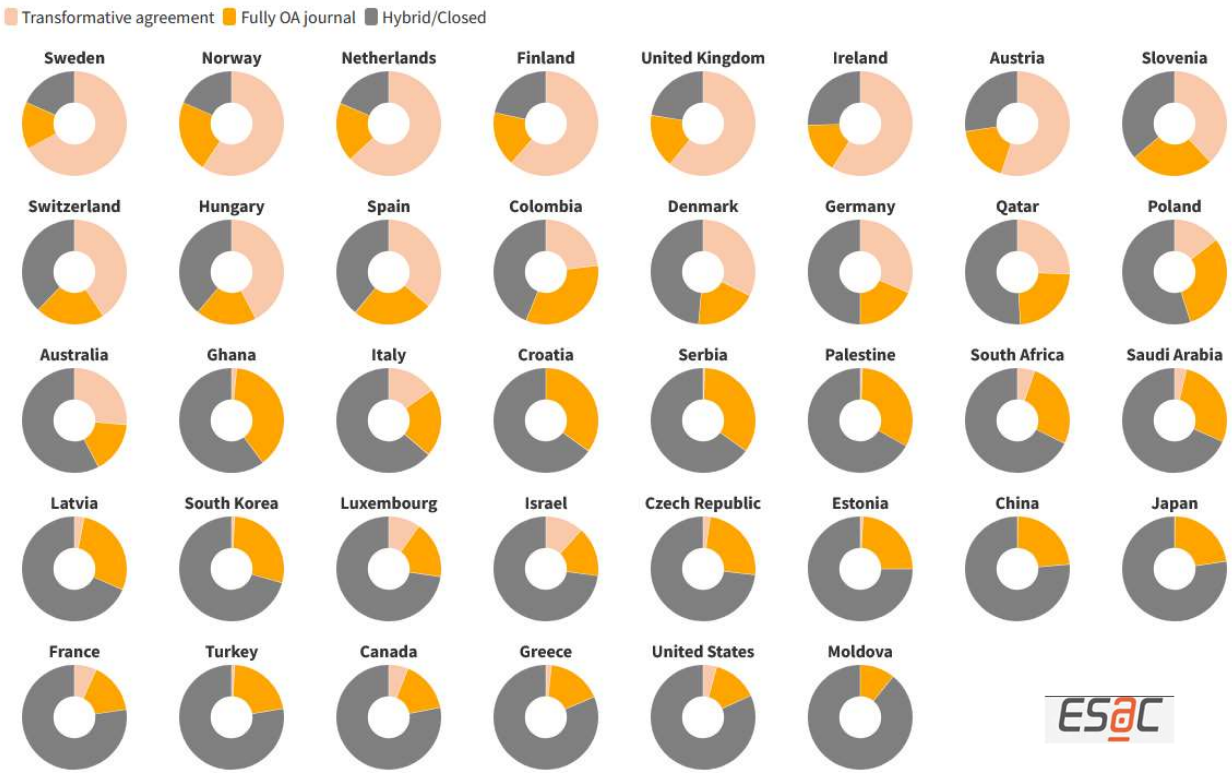
Impact
Visibility
Optimization
Evaluation

Impact of 2 initiatives: Library Publishing & OA2020

IFLA Special Interest Group
Library Publishing



https://lib-pub.org/



Source: https://github.com/subugoe/oa2020cadata/, ESAC Transformative Agreement Registry
TA data last updated: 20-05-2022

Results from the SPARC Member Survey

Exhibit 4: SPARC Survey

14. As a result of COVID-related budget pressure, how likely are you to:

		Very unlikely	Somewhat unlikely	Same	Somewhat likely	Very likely	We have already chosen to pursue this strategy	Responses
Seek discounts from publishers	COUNT	2	0	2	10	24	89	127
	ROW %	1.5%	0.0%	1.6%	7.9%	18.9%	70.1%	
Unbundle a big deal	COUNT	9	8	19	28	29	35	128
	ROW %	7.0%	6.3%	14.8%	21.9%	22.7%	27.3%	
Make significant cuts to a large journal package	COUNT	5	14	15	34	25	35	128
	ROW %	3.9%	10.9%	11.7%	26.6%	19.5%	27.3%	
Exercise a financial hardship clause	COUNT	41	30	18	20	8	10	127
	ROW %	32.3%	23.6%	14.2%	15.7%	6.3%	7.9%	
Leverage a financial hardship clause	COUNT	33	30	16	19	14	16	128
	ROW %	25.8%	23.4%	12.5%	14.8%	10.9%	12.5%	
Cut staff positions	COUNT	38	27	14	18	7	23	127
	ROW %	29.9%	21.3%	11.0%	14.2%	5.5%	18.1%	
Pursue new contract arrangements (publish & read agreements) with publishers	COUNT	10	14	32	28	25	19	128
	ROW %	7.8%	10.9%	25.0%	21.9%	19.5%	14.8%	

Source: SPARC survey

Table 1: Strategies Given More or Equal Attention as a Result of COVID-related Issues

[Q15] As a result of COVID-related issues, how has your strategy changed in relation to...?

	INCREASED ATTENTION OR RESOURCES		NO CHANGE IN ATTENTION OR RESOURCES	
	US	CANADA	US	CANADA
Licensed Digital Materials	78%	91%	18%	9%
Internal Digitization Efforts	61%	82%	35%	9%
Supporting OER Adoption	56%	82%	38%	18%
Expanding Use of Controlled Digital Lending	57%	64%	43%	36%
Supporting OER Creation	44%	73%	48%	27%
Supporting Open Access Publication	40%	64%	50%	27%
Investment in Open Infrastructure Projects	24%	73%	71%	27%
Library Publishing	17%	36%	81%	64%

SPARC Big Deal tracker

SUNY (State University of New York System)	2020	United States	Elsevier	SUNY has closely tracked the marketplace for the last two years and believes the price of	The negotiating team worked to develop a core list of approximately 250 titles that SUNY will	$7,000,000
Virginia Tech	2021	United States	Elsevier	Six universities in Virginia who have negotiated their Elsevier Big Deals collectively since 2009 were faced with major budget shortfalls for 2021 due to the economic fallout from COVID-19. We were already working together to build a more sustainable approach to collections spending, but the COVID crunch accelerated that process. To balance our budgets and make room for more diverse investments, we set a target of 50% cut in spend, and overall we reached 49.1% collectively - saving approximately $4 mil. statewide. We will be back at the table this year to negotiate terms for	For 2021, we subscribed to 228 titles on an a la carte basis.	$1,248,908

https://bigdeal.sparcopen.org/cancellations

Combination of 3 routes to reach 100% Open Access

Route 1	Route 2	Route 3
Open Access only publishing venues (Gold journals or such platforms) Immediate Open Access	Institutional Repository route Delayed (0 to 24 months) Open Access	Transition from subscription to publishing model (Hybrid journals) Immediate Open Access
Institutional Membership/OA Agreement. CC-BY License	Authors deposit Author's Accepted Manuscript (AAM) and made openly available. Copy right and reuse restrictions	Change from subscription agreement to read and publish / offset agreements with publishers. CC-BY License
• APCs can be negotiated down • Centralized invoice management and reporting	• Establish repository and Open Access policy • Integration with other platforms and search engines • Value added services • Support global OA infrastructure	• Negotiate transformative deals and avoid double dipping • Support models like Diamond, S2O, SCOAP3 etc • Centralized invoice management and reporting

Researcher OA actions

Institutional / Library Role

Support global OA infrastructure including Preprint servers

More awareness

Establish OA Policy & repository.

Repository Integrations to CRIS, ORCID, PlumX, search engines.

Value added services – host research data, DOIs to datasets etc

Negotiate transformative, off-set or discount subscription agreements.

Transform subscription budget to publishing budget.

Author fund & Library publishing

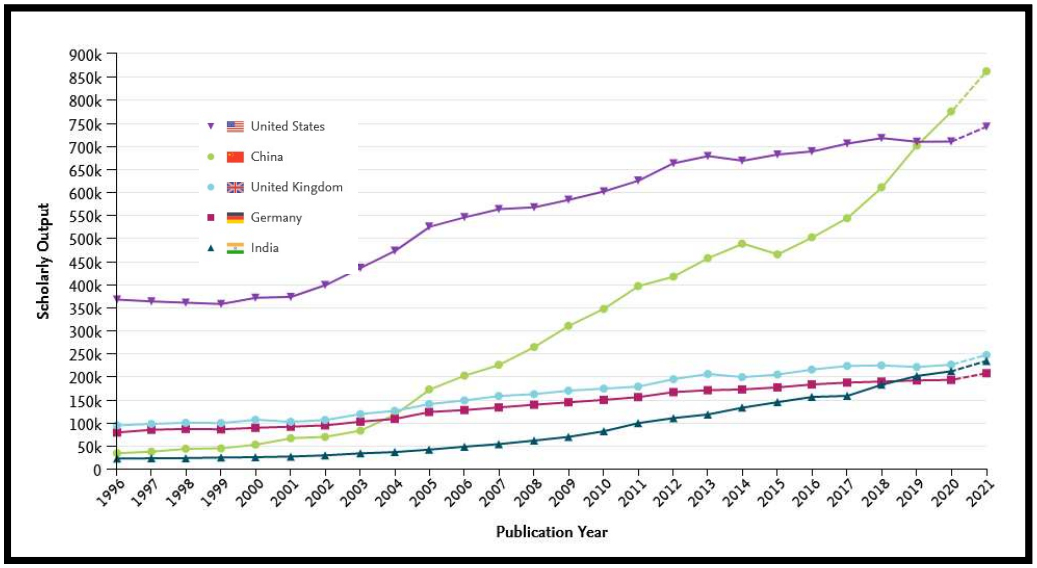
Self-archive (eg: pre-print server)

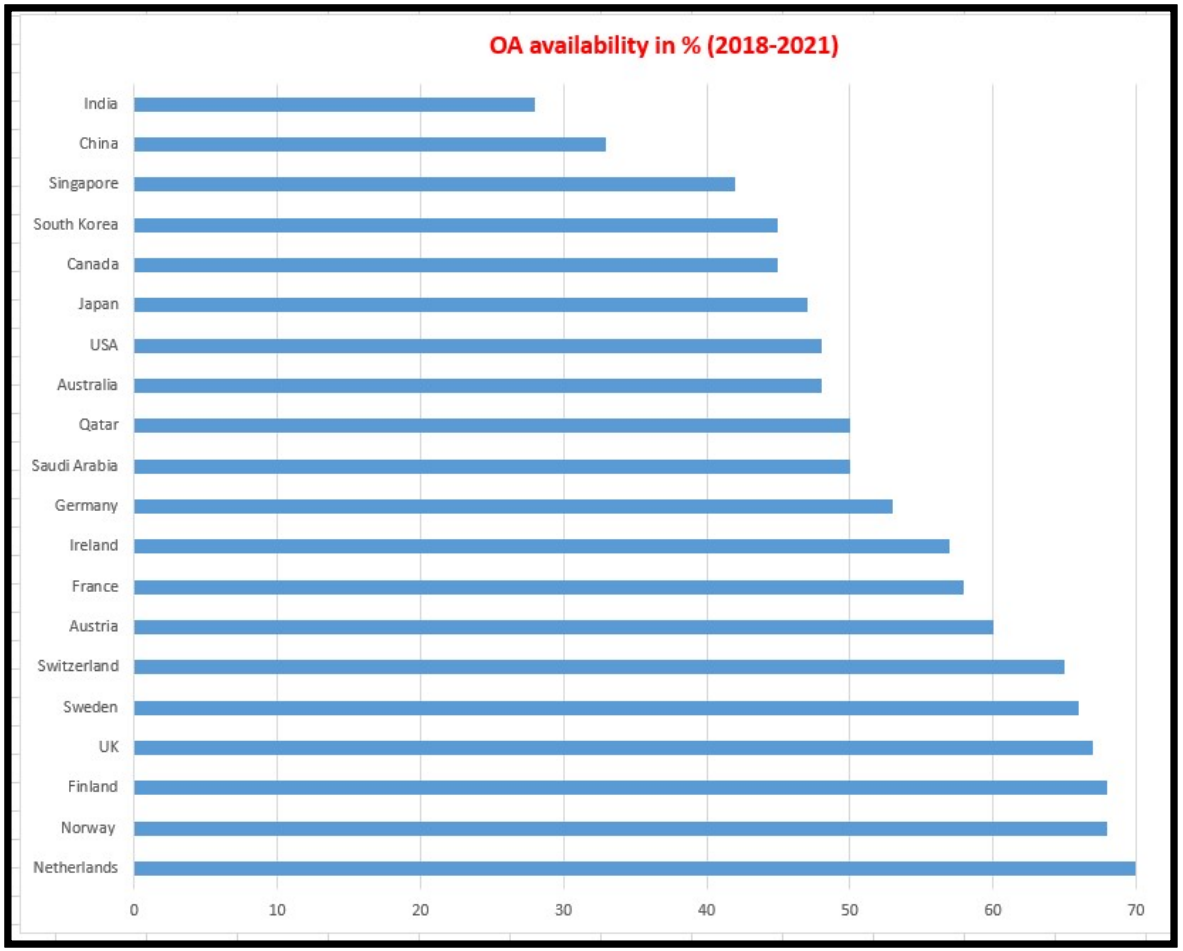
Deposit to Institutional Repository

Pay to publish (Article Processing Charge - APC)

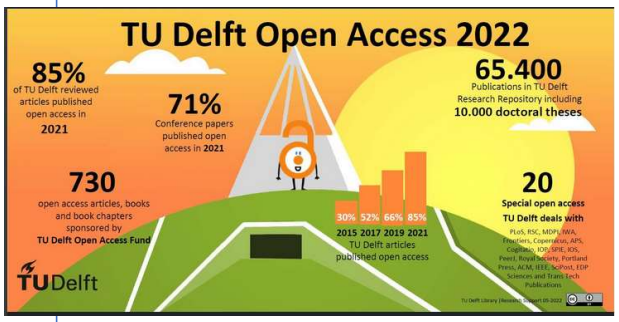
Versions of Record

OA availability by percent (SciVal / Unpaywall data)





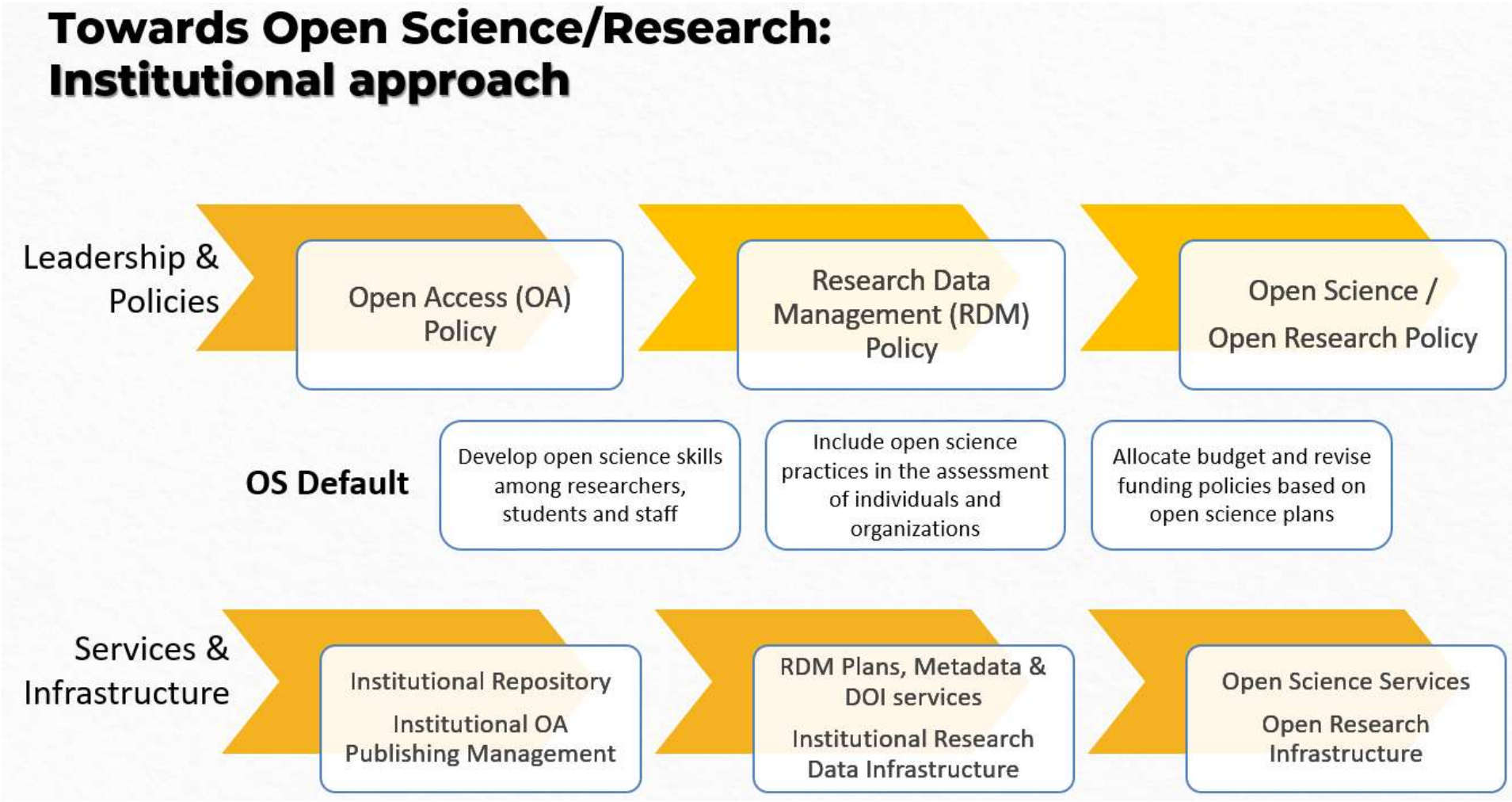
Vrije 76%
Amsterdam 75%
Oxford 75%
Cambridge 74%
Caltech 71%
KAUST 69%
Imperial College 69%
ETH 68%
MIT 66%
Harvard 62%
Stanford 60%



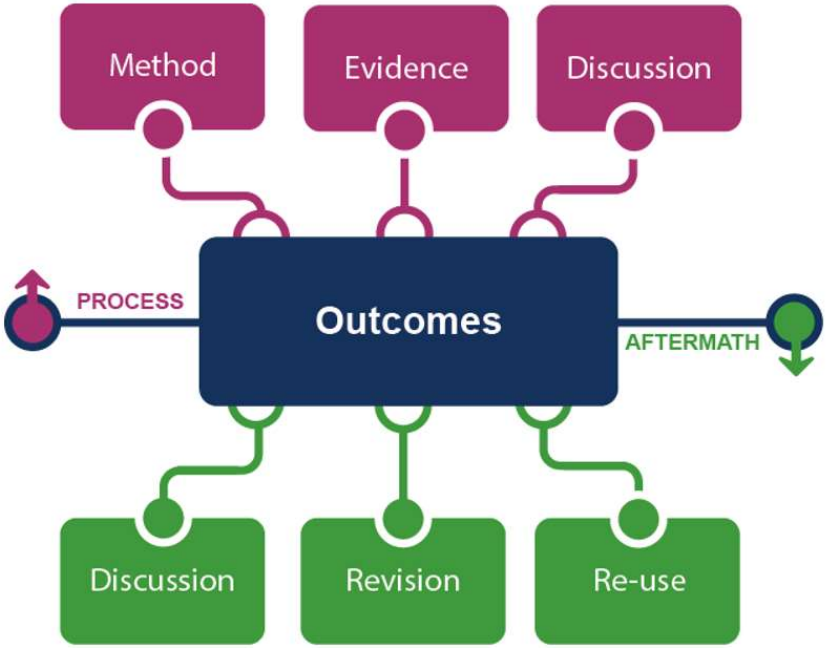
Library Collection: Measuring success (early thoughts):

- How to assess the success of a library collection?
- Number of papers downloaded OR number of papers supported for OA publication?
- Percentage of OA articles published through library's OA agreements and collection budget
- Would faculty expectations about the Library collection change? (It changed from holdings to access, this may change from access to publish
- Are you negotiating access rights or publishing rights?
- How do we balance to cost between
  - Research publishing intensive institutions Vs less publishing organizations?
  - Developed and Less Developed nations

Towards Open Science/Research: Institutional approach



New Scholarly Record

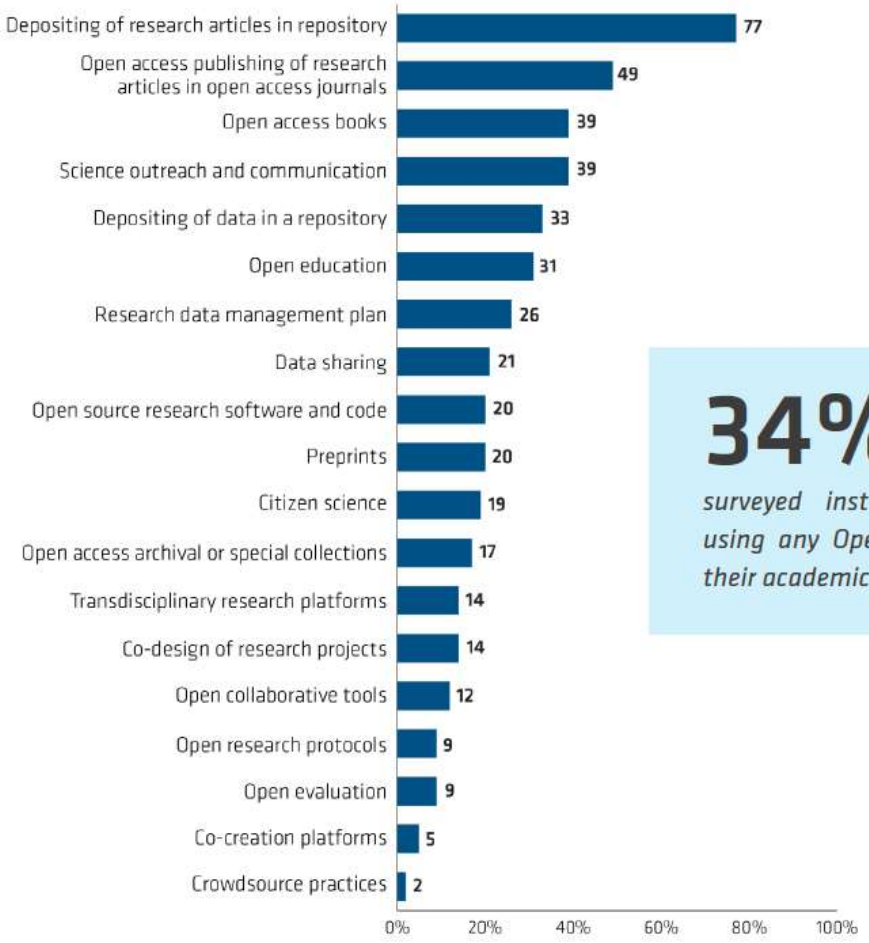


From UNESCO open science recommendations

Reviewing research assessment and career evaluation systems in order to align them with the principles of open science. Considering that a commitment to open science requires time, resources and efforts that cannot be automatically converted into traditional academic output, such as publications, but which can have a significant impact on science and society, evaluation systems should take into account the wide breadth of missions within the knowledge creation environment. These missions come with different forms of knowledge creation and communication, **not limited to publishing in peer reviewed international journals**

Figure 44 – Open Science elements included in academic assessments

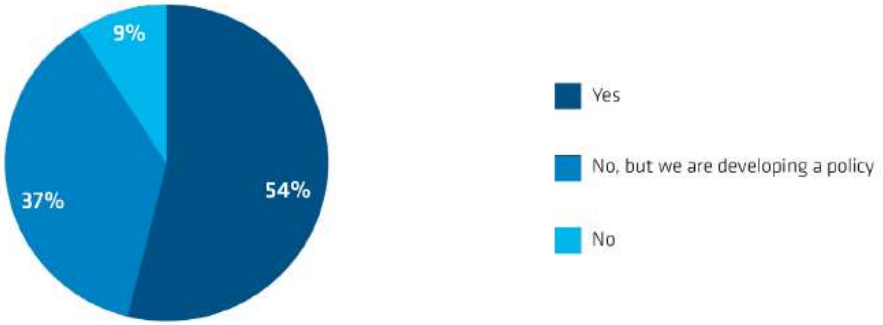
Number of respondents: 172/272.



Note: Only institutions that indicated using at least one Open Science element in their academic assessments are included in this Figure.

Figure 10 – Existence of an institutional Open Science policy

Number of respondents: 271/272.



34%

surveyed institutions reported not using any Open Science elements in their academic assessments.

Fully integrate Open Science in reward and incentive practices. For Open Science to become the norm, it must become an integral part of academic assessments. Research funders and institutions play a key role in making this transition possible, by increasingly incorporating Open Science contributions in assessment and restructuring current award and recognition systems.

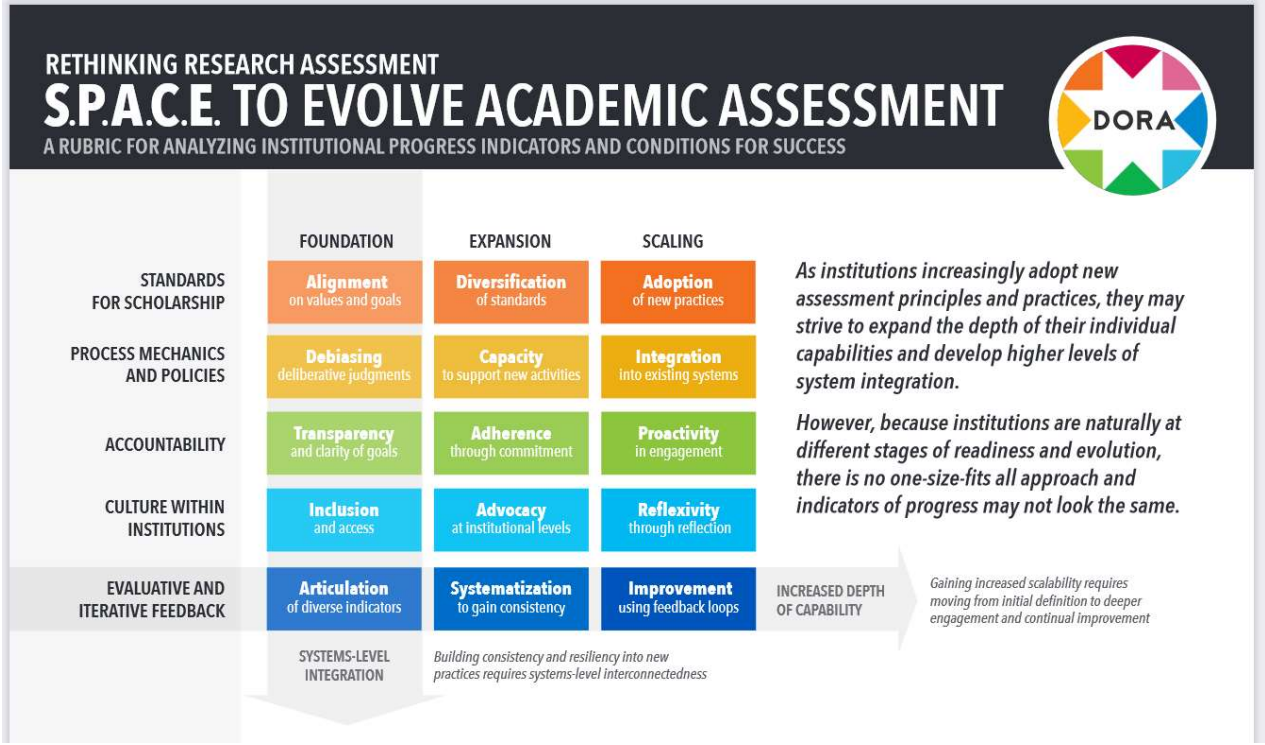
From principles to practices: Open Science at Europe's universities 2020-2021 EUA Open Science Survey results, July 2021

European Commission

List of organisations having expressed interest in being part of a coalition on reforming research assessment (*last updated on 16th May 2022*)

More than 300 EU organizations **get closer to a consensus on research assessment reform**

"…. research assessment primarily on qualitative evaluation by peers; abandon the "inappropriate uses" of journal and publication metrics; and avoid the use of international rankings of research organizations in research assessment. …."

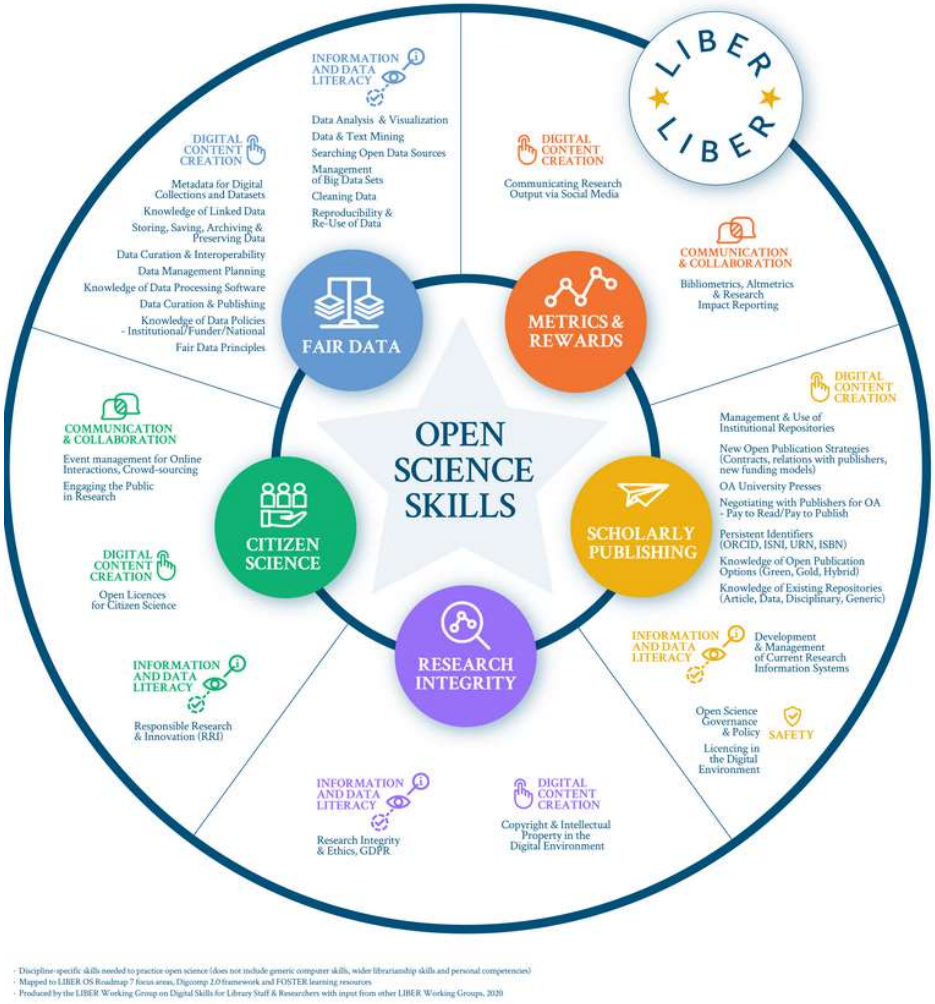


Open Science : Role of Libraries

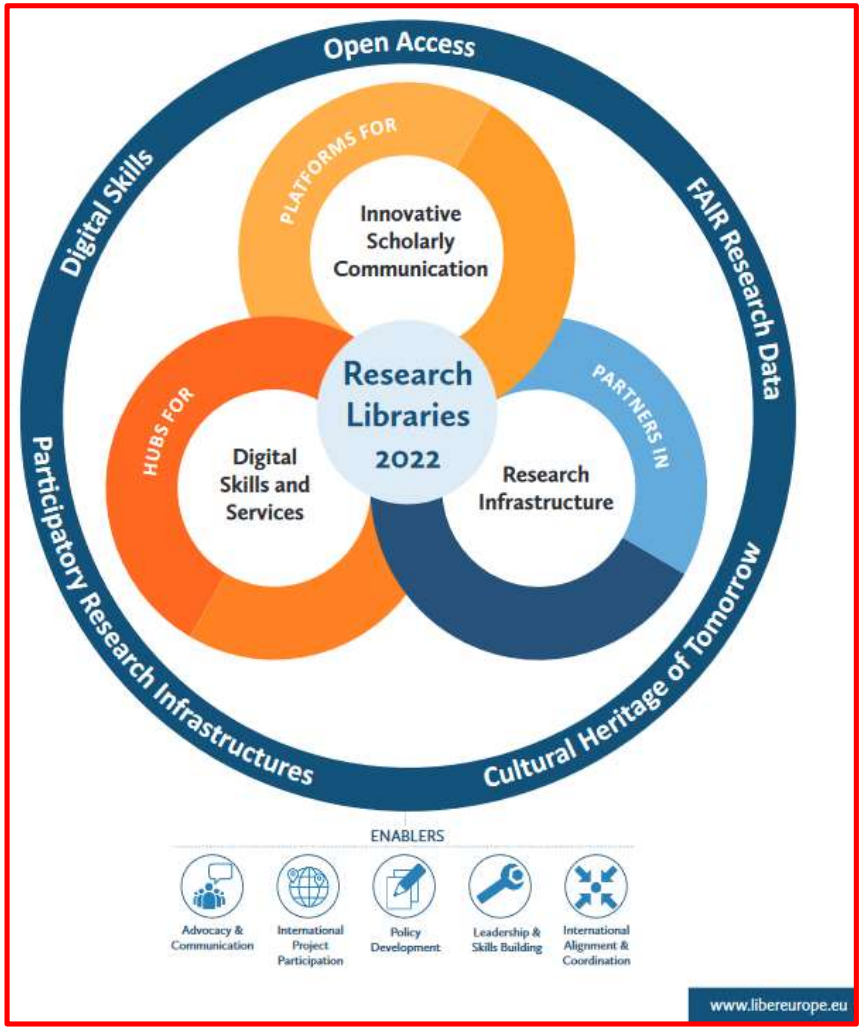
And their role is that of **enablers**: "*Libraries have adapted their role and are now active in the preservation, curation, publication and dissemination of digital scientific materials, in the form of publications, data and other research-related content. Libraries and repositories constitute the physical infrastructure that allows scientists to share use and reuse the outcome of their work, and they have been essential in the creation of the Open Science movement"* © OECD, 2015.

- **Advocating and raising awareness:** promotion of the benefits of Open Science should take place in parallel with the development of tools and services, the incentives and recognition mechanisms that support excellence in Open Science. Libraries can advocate within institutions to develop open access policies and roadmaps. This will benefit not only researchers, but also other stakeholders at institutional level and international level, and even the whole society, promoting Open Science and engaging with citizens.
- **Giving support to the infrastructures** to share articles or data, including repositories; keeping with their involvement and responsibilities in the development and governance of repositories of publications and data, in regards to appraisal, selection, description and metadata application, curation and preservation; information retrieval; monitoring data reuse, citation and impact, etc.
- Contributing to the development of **research data management (RDM)** policies and strategies at their home institutions and carrying RDM themselves;
- **Training and supporting researchers** to open their research workflows, sharing and reusing the research outputs produced by others. Besides the necessary research infrastructure, researchers need support at a practical level throughout the whole research cycle. Librarians can offer guidance, training and services in: the provision of information during the exploratory stage of research; funding opportunities and requirements; bibliography and data management; applying metadata; identification of open research methods and tools for analysis; outputs sharing and publication; data citation, licensing and other intellectual property issues; preparing data for deposit and long-term preservation of data, among others. For these purposes, librarians need to know their community research practices in regards to information use, production, and sharing, and the platforms, tools and services that they use.

Open Science Skills for Librarians & Researchers



- Discipline-specific skills needed to practice open science (does not include generic computer skills, wider librarianship skills and personal competencies)
- Mapped to LIBER OS Roadmap 7 focus areas, Digcomp 2.0 framework and FOSTER learning resources
- Produced by the LIBER Working Group on Digital Skills for Library Staff & Researchers with input from other LIBER Working Groups, 2020



Developing the Librarian Workforce for Data Science and Open Science

Computational Skills
Computational literacy
Database design
Familiarity with relevant coding languages, such as R and Python
Machine learning and data or text mining
Data visualization

Data Skills
Data management plans and data workflows
Data and metadata standards and curation
Data sharing and reuse
Data citation
Data policy and governance

Research and Subject Matter Knowledge
General understanding of the relevant science or subject matter
Research design and workflows
Statistics
Methods for reproducibility

Interpersonal Skills
Team science skills
Entrepreneurship
Advocacy skills
Community building

Traditional Library Skills
Consultation and reference
Metadata
Literature searching
Scholarly communication
Bibliometrics
Training and instruction
Assessment and evaluation

Skills for Developing Programs and Services
Interview and assessment skills to understand institutional needs
Scoping and planning for sustainability
Willingness to embrace failure
Communication and marketing skills

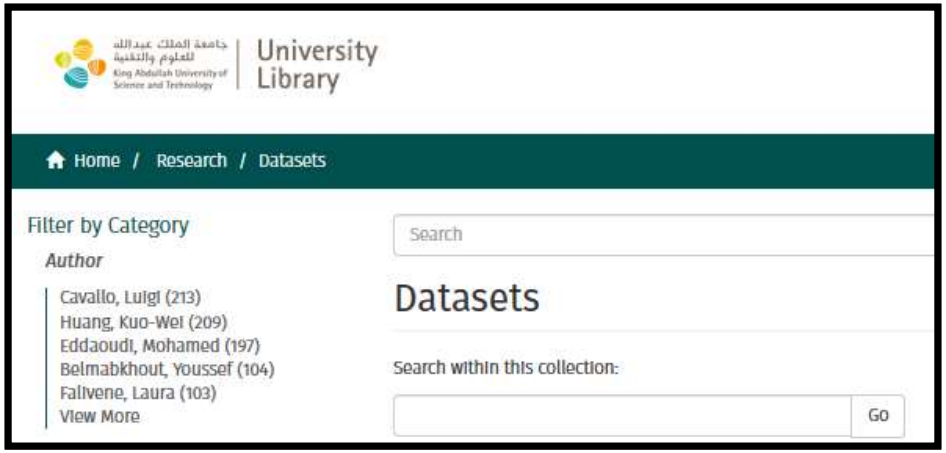
Skills for Lifelong Learning
Flexibility and adaptability
"Anthropological" mindset
Logic and problem-solving
Design thinking
Computational thinking

Workshop on Developing the Librarian Data Science and Open Science Workforce held April 15-16, 2019 at the National Library of Medicine (NLM)
Federer, L., Clarke, S. C., & Zaringhalam, M. (2020, January 16). Developing the Librarian Workforce for Data Science and Open Science. https://doi.org/10.31219/osf.io/uycax

Open Data: research data Management

Research data management (RDM) is assuming an increasingly prominent place in scholarly communication, funder requirements, codes of academic practice, university research strategy, and even national policy.

© OCLC RDM report



- Raw/initially processed data produced at a research facility such as an observatory
- 'Research ready' processed data which has been fully calibrated, combined and cleaned/annotated
- Published output dataset – following detailed analysis of research ready datasets
- Published catalogue type representation of published output dataset

DataCite FIND, ACCESS, AND REUSE DATA

DRYAD

DCC

Open Educational Resources (OER)

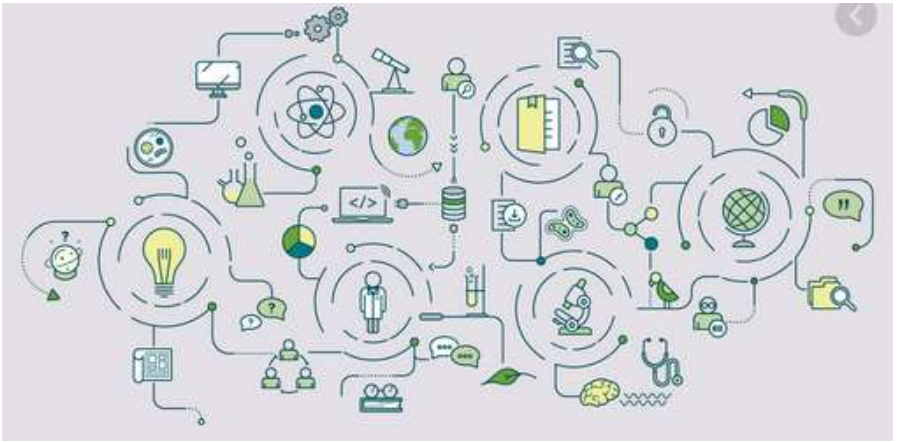
Open Educational Resources (OER) are teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions.

@UNESCO

Open Source for Open Science

Open research software, or open-source research software, refers to the use and development of software for analysis, simulation, visualization, etc. where the full source code is available. In addition, according to the Open Source Definition, open-source software must be distributed in source and/or compiled form (with the source code available in the latter case), and must be shared under a license that allows modification, derivation, and redistribution.

© The Open Science Training Handbook



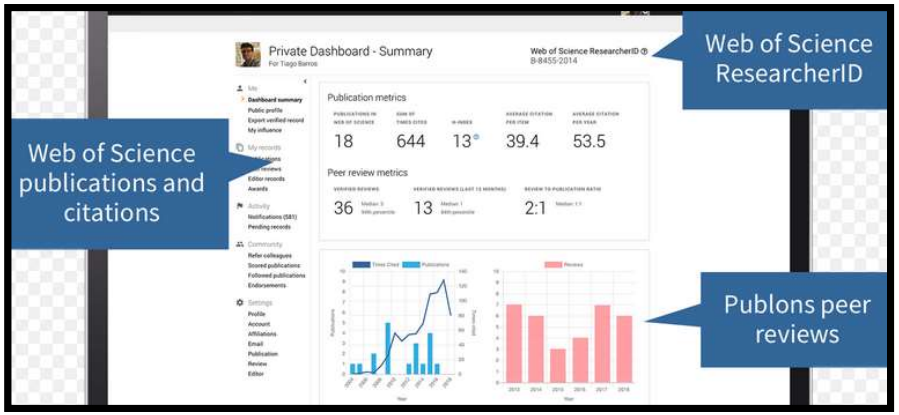
Open Peer Review OPR

Open peer review is an **umbrella term** for a number of overlapping ways that **peer review models** can be adapted **in line with the aims of Open Science.**

- Open identities
- Open reports
- Open participation
- Open interaction
- Open pre-review manuscripts
- Open final-version commenting
- Open platforms

FOSTER

- \+ Transparency
- \+ Speed
- \+ Reliability
- \+ Consistency
- \+ Context
- \+ Motivation



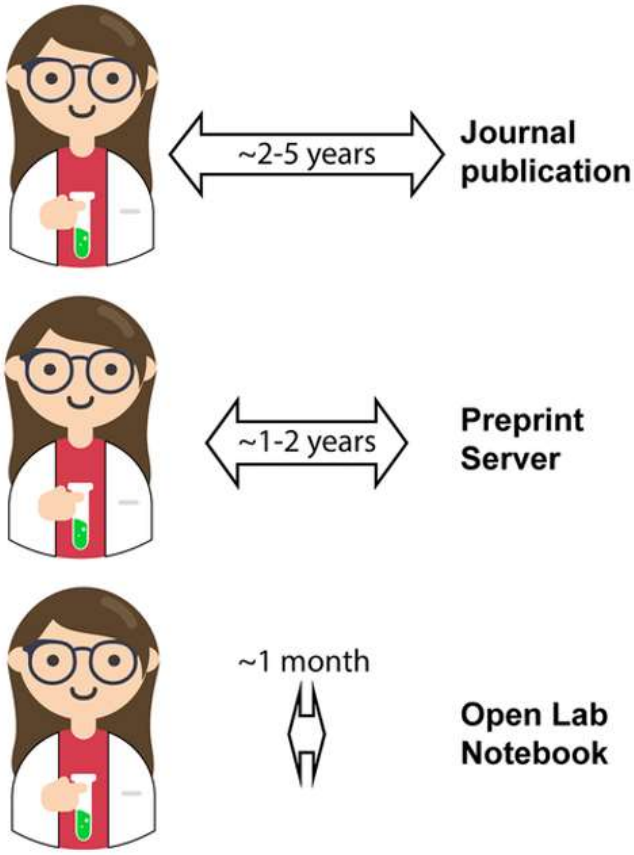
Publishers provide peer- reviewers training
Peer review part of research profiles
Include in our awareness sessions
Preprint servers : example

Open Notebook Science

Open-notebook science is the practice of making the entire primary record of a research project publicly available online as it is recorded. This involves placing the personal, or laboratory, notebook of the researcher online along with all raw and processed data, and any associated material, as this material is generated.

© Wikipedia

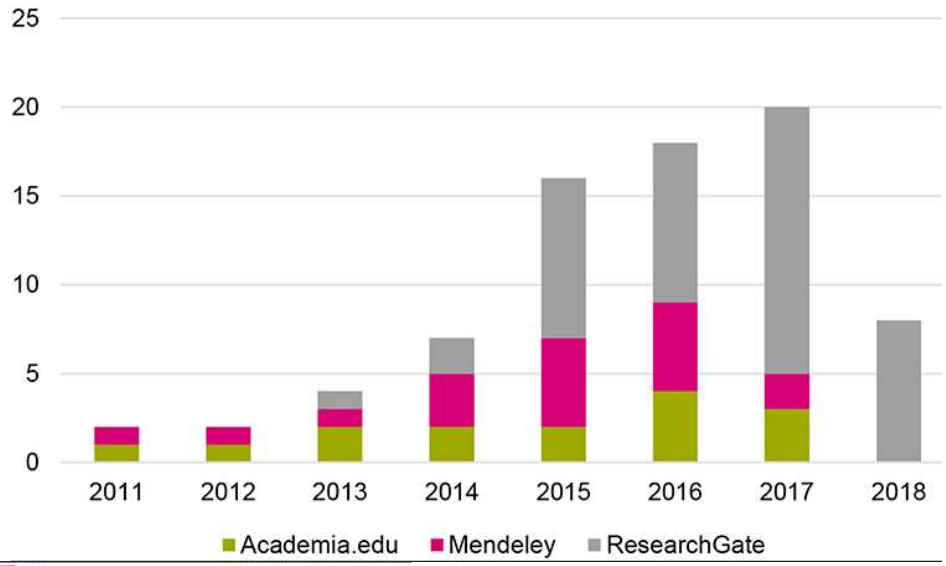
Open notebooks drastically reduce the time frame from bench to publication in the public domain.

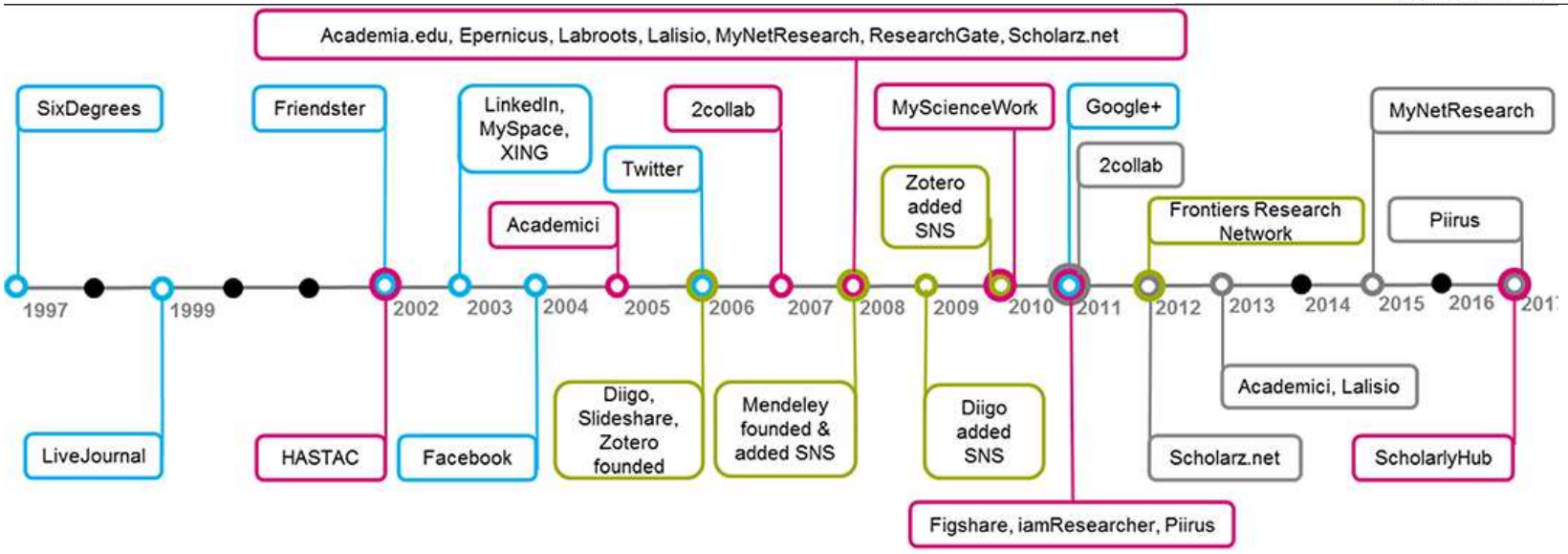


Harding RJ (2019) Open notebook science can maximize impact for rare disease projects. PLOS Biology 17(1): e3000120. https://doi.org/10.1371/journal.pbio.3000120
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000120

Scientific Social Networks

"Academic social media" sites are targeted toward researchers and academics, but the same cautions exist here as on Twitter, Facebook, and other more social sites. Be aware of your audience, privacy settings, and your digital reach.





Jordan K (2019) *Front. Digit. Humanit*. 6:5. doi: 10.3389/fdigh.2019.00005

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Quad leaders will promote concept of open science: White House

News9live
24 May 2022 5:44 AM

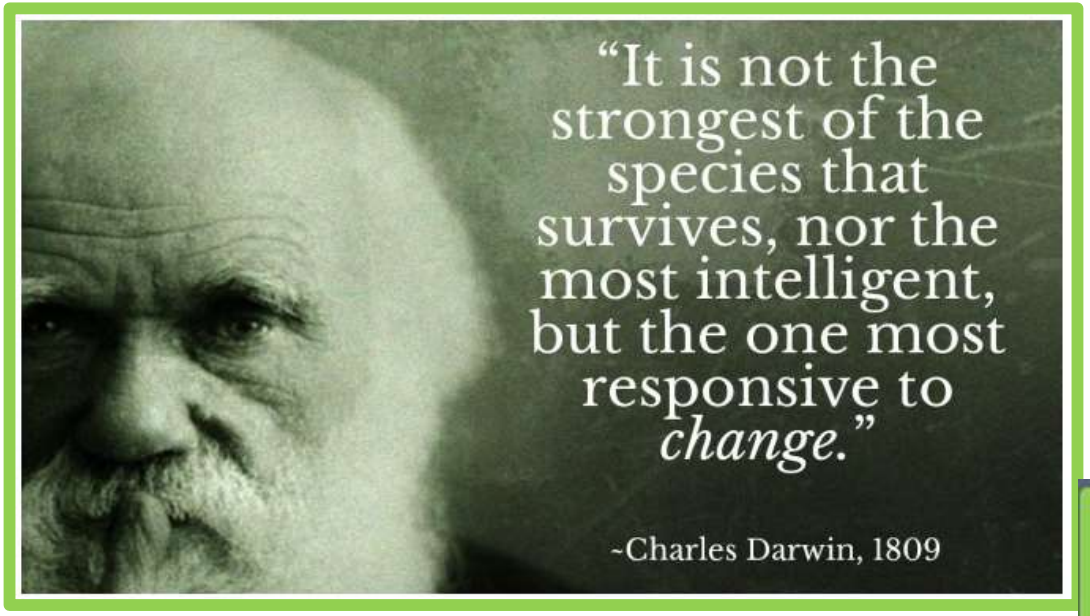
THE WHITE HOUSE

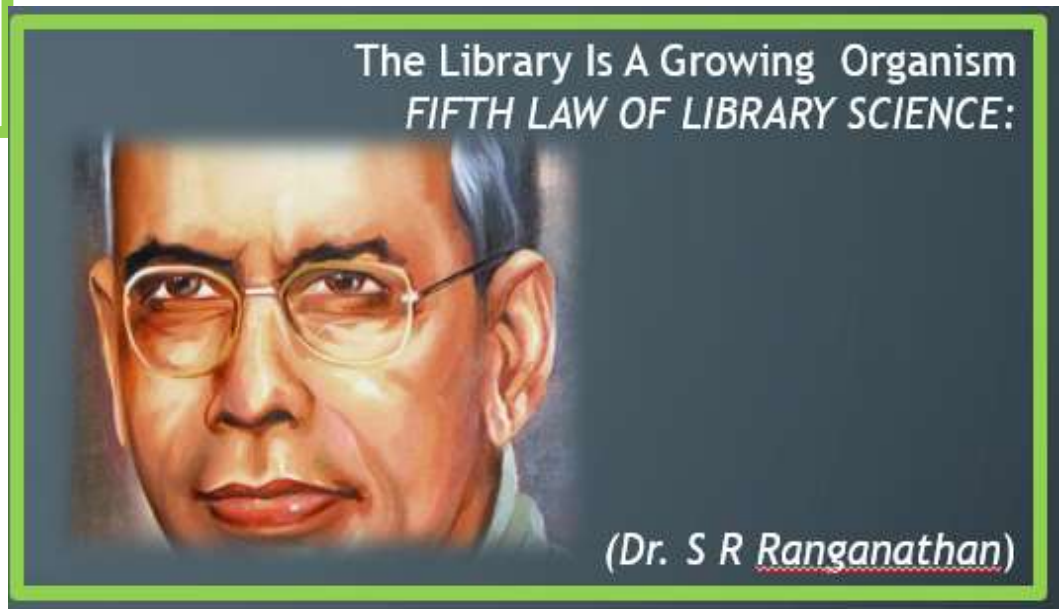
Space

As leaders in space, Quad countries are strengthening cooperation and pooling our collective expertise to exchange satellite data, enable capacity-building, and consult on norms and guidelines.

- Quad partners will strengthen their commitments to the free, full, and open **sharing of space-based civil Earth observation data,** and will jointly develop and promote the concept of Open Science in the region and globally.

https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/23/fact-sheet-quad-leaders-tokyo-summit-2022/


"It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to *change.*"
~Charles Darwin, 1809


The Library Is A Growing Organism
FIFTH LAW OF LIBRARY SCIENCE:
(Dr. S R Ranganathan)

Thank you