



Shaping International Research Software Policy

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Research Software Alliance (ReSA)**



Agenda

1. The importance of research software
2. Policies that support research software
3. Research software is critical to the future of AI-driven research
4. How you can make a difference

What is research software?

Code

Source code

Scripts

Software

Models

Algorithms

Workflows

Created during the
research process or for
a research purpose

Morane Gruenpeter et al., [Defining Research Software: a controversial discussion](#)



Diagram from [“EVERSE Paving the way towards a European Virtual Institute for Research Software Excellence” presentation](#) by Fotis Psomopoulos, adapted by Aleksandra Nenadic. [CC BY 4.0 License](#)



Research software is a component of our instruments

Research software is the instrument

Research software analyses research data

Research software presents research results

Research software assembles or integrates existing components into a working whole

Research software is infrastructure or an underlying tool

Research software facilitates distinctively research-oriented collaboration

Research software itself is a research tool for technology research

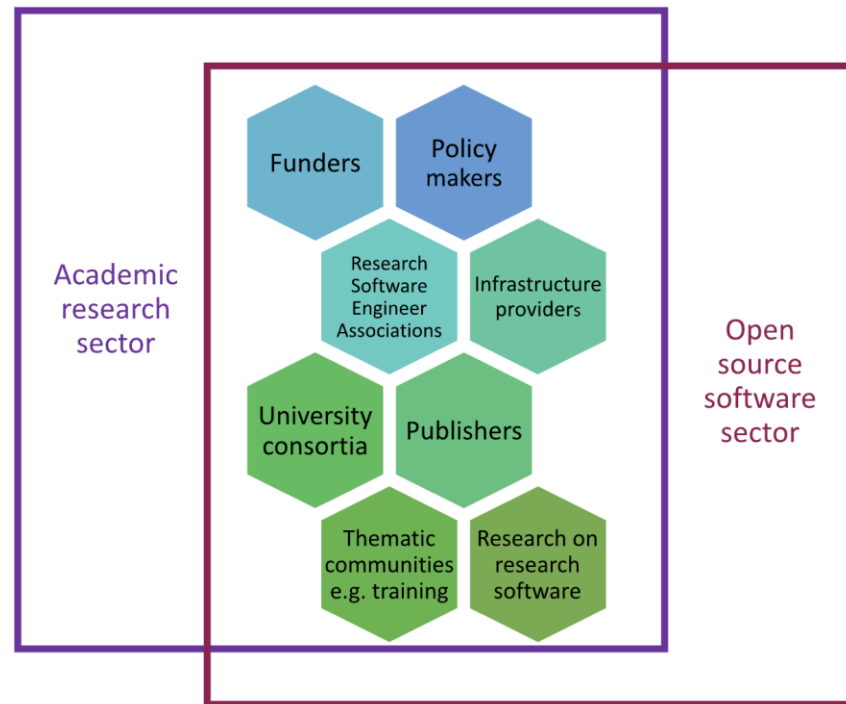
Research Software Alliance (ReSA)

Vision:

Research software and those who develop and maintain it are recognised and valued as fundamental and vital to research worldwide.

Mission:

To advance the [research software ecosystem](#) by collaborating with decision makers and key influencers.



Research software is a research output

- and needs preservation

- ~**50%** of 13,000 Australian Research Council grants 2010-19 resulted in research software ([Eva Maxfield Brown & Nic Weber](#), 2024)
- ~**20%** of US National Science Foundation projects (totalling USD\$10b) over 11 years discussed software in their abstracts ([Daniel S. Katz](#), 2021)

Research software is a research output

- and needs citation

Springer Nature asked their authors if they had developed new code as part of their work. “Yes” results included:

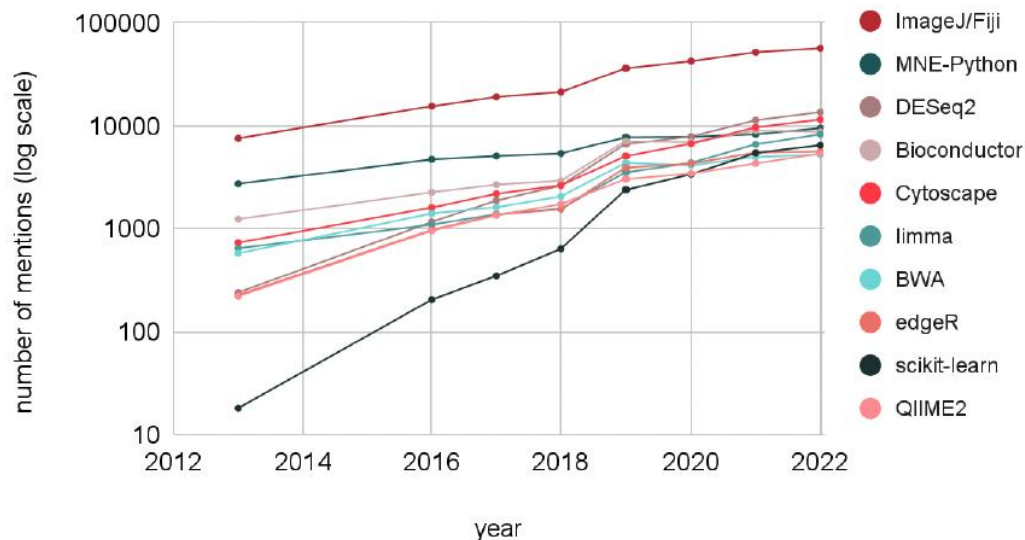
- Nature Computational Science - **66%**
- Nature - **20%** ([Erika Pastrana](#), 2024)

Research software is a research output

- and needs recognition

Figure 11. Top ten EOSS software projects based on mentions in publications.¹⁹

A. Total number of papers



Chan Zuckerberg Initiative

Kate Hertweck, Carly Strasser,
Dario Taraborelli. [Insights and Impact From Five Cycles of Essential Open Source Software for Science](#). [CC BY 4.0 License](#)

Research software is a research output

- and needs management

32,000 public GitHub repositories
were associated with University of California San Diego

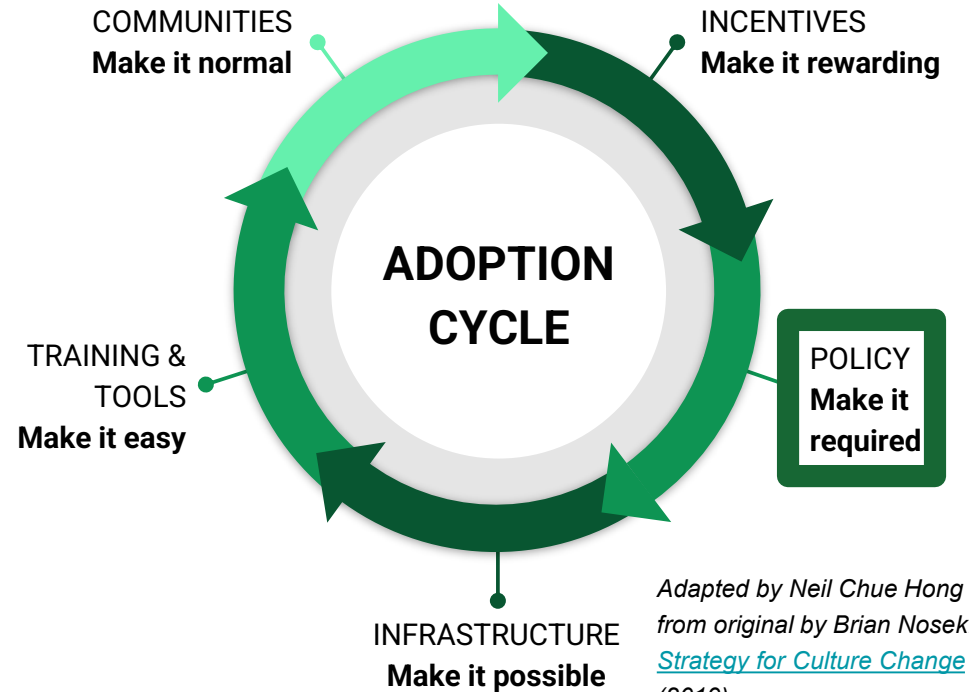
([Carlos Maltzahan](#), 2023)

= a huge amount of open source activity

Open Source Program Offices (OSPOs)

can be one way to manage and support these **assets** at the institutional level

Why is policy important?



*Adapted by Neil Chue Hong
from original by Brian Nosek:
[Strategy for Culture Change](#)
(2019)*

International research software policy

- OECD's 2025-26 program of work on [Policies for research software in the age of artificial intelligence](#)
- Builds on revised [Recommendation concerning Access to Research Data from Public Funding](#) adopted in 2021
- Aims to produce a policy paper based on international evidence and case studies with recommendations for OECD member states.



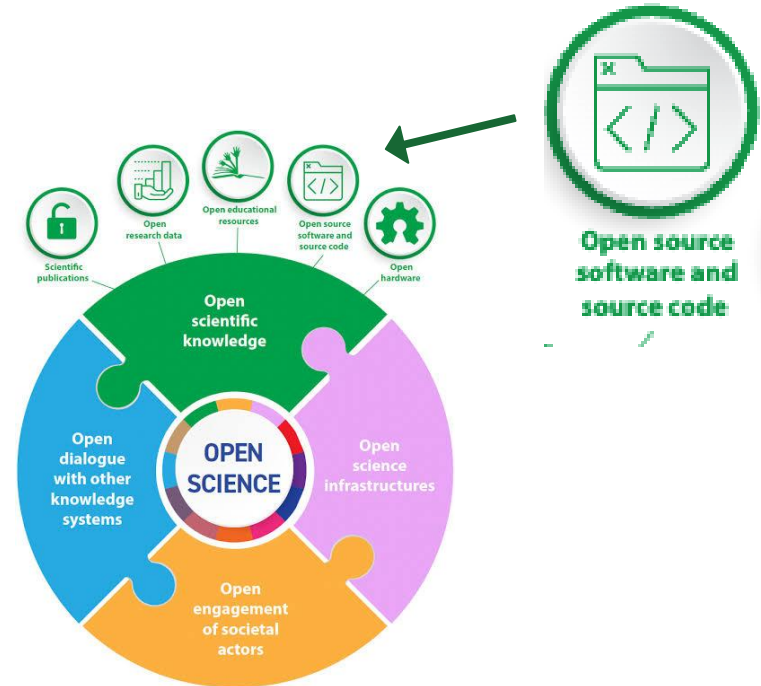
UNESCO Recommendation on Open Science:

Open source software and source code
that generally include software whose source
code is made publicly available ...

under an open license ...

and made available on openly accessible
repositories and ...

accompanied with open data and open
specifications of the environment required to
compile and run it.



Amsterdam Declaration on Funding Research Software Sustainability (ADORE.software)

Recommendations on

- Research Software Practice
- Research Software Ecosystem
- Research Software Personnel
- Research Software Ethics

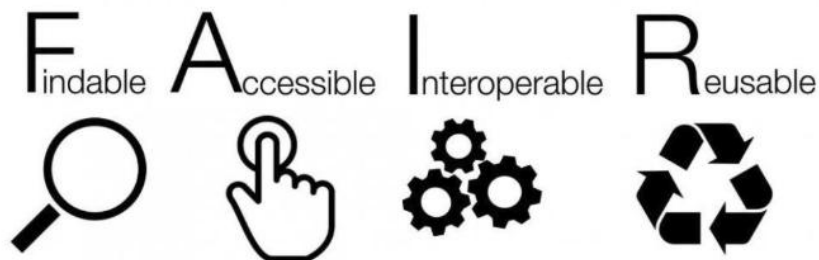


Dutch signatories recently shared implementation experiences and identified next steps in this [blog post](#).

National policy

- EOSC EVERSE Policy Brief: [Software as a first class citizen in research](#)
- Science Europe: [Developing and Aligning Policies on Research Software](#)
- Ireland: [Framework for Managing University Open Source Software](#)
- ReSA's [national policy database](#)

Country	Organisation	Document	Policy or Strategy	Date
Australia	Australian Research Data Commons (ARDC)	A National Agenda for Research Software Australia	Strategy	2022
Australia	National Health and Medical Research Council (NHMRC) and Medical Research Future Fund (MRFF)	Open Science Policy	Policy	2025
Canada	Digital Research Alliance of Canada	National Research Software Strategy	Strategy	2023
Canada	Government of Canada	Tri-Agency Research Data Management Policy	Policy	2021
Europe	European Commission	Open science policy		



FAIR Principles for Research Software (FAIR4RS Principles)

Chue Hong, Neil P. ; Katz, Daniel S. ; Barker, Michelle ; Lamprecht, Anna-Lena ;
Martinez, Carlos ; Psomopoulos, Fotis E. ; Harrow, Jen ; Castro, Leyla Jael ;
Gruenpeter, Morane ; Martinez, Paula Andrea ; Honeyman, Tom ; Struck, Alexander ;
Lee, Allen ; Loewe, Axel ; van Werkhoven, Ben ; Jones, Catherine ; Garjo, Daniel ;
Plomp, Esther ; Genova, Francoise ; Shanahan, Hugh ; Leng, Joanna ;
Hellström, Maggie ; Sandström, Malin ; Sinha, Manodeep ; Kuzak, Mateusz ;
Herterich, Patricia ; Zhang, Qian ; Islam, Sharif ; Sansone, Susanna-Assunta ;
Pollard, Tom ; Atmojo, Udayanto Dwi ; Williams, Alan ; Czerniak, Andreas ;
Niehues, Anna ; Fouilloux, Anne Claire ; Desinghu, Bala ; Goble, Carole ;
Richard, Céline ; Gray, Charles ; Erdmann, Chris ; Nüst, Daniel ; Tartarini, Daniele ;
Rangelova, Elena ; Anzt, Hartwig ; Todorov, Ilian ; McNally, James ; Moldon, Javier ;
Burnett, Jessica ; Garrido-Sánchez, Julián ; Belhajjame, Khalid ; Sesink, Laurents ;
Hwang, Lorraine ; Tovani-Palone, Marcos Roberto ; Wilkinson, Mark D. ; Servillat, Mathieu ;
Liffers, Matthias ; Fox, Merc ; Miljković, Nadica ; Lynch, Nick ;
Martinez Lavanchy, Paula ; Gesing, Sandra ; Stevens, Sarah ; Martinez Cuesta, Sergio ;
Peroni, Silvio ; Soland-Reyes, Stian ; Bakker, Tom ; Rabemanantsoa, Tovo ;
Sochat, Vanessa ; Yehudi, Yo ; RDA FAIR4RS WG

FAIR Guiding Principles are intended to apply to all digital objects.

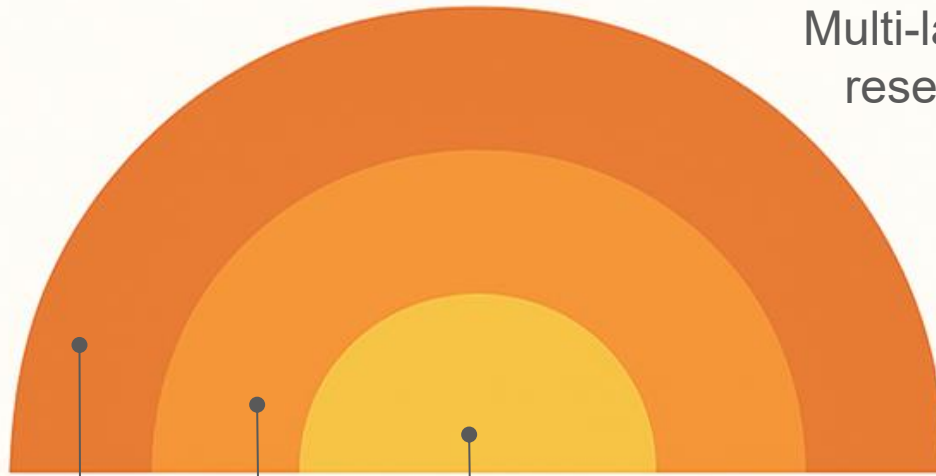
In practice are most applicable to research data - but software is different to data

FAIR for Research Software (FAIR4RS) Principles released in 2022 and widely adopted

Policies in Research Organisations for Research Software ([PRO4RS WG](#))

-  What exists that we can learn from? → [List of institutional software policies](#)
-  How does policy change happen? → [Resources for supporting policy change in research institutions in practice](#)
-  Who's implemented this already? → [Case studies of implementation of research software policies](#)
-  Categorisation of policies → [Identifying gaps in research software policy](#)

Multi-layered approach for research software policy development



Mechanisms that enable policy in practice (e.g. infrastructure for software sharing, training opportunities, support roles, reproducibility guidelines)

Resources for policy change conclusions

- Report's resources offer multiple approaches
 - Should choose the model that works best for you and your situation
- Common thread
 - Identify a key success factor
 - Identify target community/stakeholders to engage
- Aim at policy that
 - Sets out expected behaviours that will be rewarded (or deprecated)
 - Supports necessary shift through procedural and behavioural changes
- Without stakeholder buy-in, positive change won't happen

Institutional Policy Pathways for Supporting Research Software: Global Trends and Local Practices

- Highlights critical policy gaps, particularly related to consideration of research software personnel in policy work focused on reform of research assessment.
- Identifies broader work of relevance, including:
 - OpenAIRE's [model policy](#) recommends that RPOs establish reward mechanisms for researchers practices
 - OPUS [Research Assessment Framework](#)
 - RDA SHARing Rewards & Credit (SHARC) Interest Group [templates for FAIRness evaluation criteria](#) for researcher self-assessment,

Research software is critical to the future of AI-driven research

AI is dependent on software - data preparation and model training are performed by software, models are implemented in software.



- [Research Software Engineering in the Age of Generative AI: Building a Community Vision report](#)
- [Research Software in an Age of AI-Assisted Development: Reflections from Edinburgh](#)
- [Research Software Engineers in the Age of GenAI: Same Value, Changing Practice](#)

[Position Statement on Generative AI in the RSE Workplace](#) includes:

- Research software engineering work is people work
- GenAI is a tool, not a substitute for human judgment
- Sustainability and transparency matter more than ever



The Research Software Community - where are we now?

We are currently building GenAI tools for research personnel. We must also build infrastructure for research in a GenAI-mediated world.

1. The research community now needs a verification system/trust infrastructure.

- GenAI is making creation private and cheap while making verification (trust, judgment and stewardship) expensive.
- We spent decades constructing mechanisms that makes papers verifiable (albeit imperfectly). what is the corresponding infrastructure for AI-mediated research?

This amplifies existing research software community issues (especially around verification).

AI policy and research software

[Institutional Guidance on AI University of Illinois Urbana-Champaign](#) [Faculty Senate IT Committee](#)

Tiered Disclosure / Citation Model (operational default)

Tier	Typical Examples	Suggested Transparency Expectation
Tier 0 Ambient/embedded AI	Autocomplete, spell/grammar check, search-engine summaries, basic accessibility features.	No disclosure expected. Treat as “background infrastructure,” but remain cautious about accuracy and bias.
Tier 1 Non-substantive assistance	Brainstorming, outlining, formatting, translation drafts, grammar edits.	Disclose tool + purpose (e.g., “Used [tool] for grammar/outline assistance”). Prompts not usually required.
Tier 2 Substantive contribution / high stakes	Generating or rewriting substantial text/code, summarizing sources, analyses, grading/feedback drafts, policy language, grant/manuscript drafting.	Disclose tool + purpose + inputs/prompt(s) or “prompts available upon request.” If verbatim output is used, quote or clearly mark it. Humans remain accountable.

How you can make a difference

Policy makers:

- See national policy [examples](#)
- Join [Research Software Policy Forum](#)
- See institutional policy [recommendations and examples](#)

Funders (national, philanthropic, industry):

- Join [Research Software Funders Forum](#)
- Adopt the [Amsterdam Declaration on Funding Research Software Sustainability](#)
(ADORE.software) recommendations & [toolkit](#)

Research institutions:

- See institutional policy [recommendations and examples](#)
- Recognise [Research Software Engineers in the Age of GenAI: Same Value, Changing Practice](#)

Research software engineers/researchers who code:

- Join RSSE Africa

Engaging with the Research Software Alliance (ReSA)

- Receive updates through our regular [newsletter](#)
- Join the ReSA [Slack](#) to share what is happening in your community
- Become an [Organisational Member](#) to financially support our work



Research Software Alliance

*Our mission is to advance the research software ecosystem by collaborating with
decision makers and key influencers*

Thank you to the ReSA team and Organisational Members



National Institutes
of Health

