Landscape of policies around research software

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Relevance of research software

Funding

—~20% of National Science Foundation (USA) projects over

11 years discuss software in their abstracts ($10b)

Publications

—Software intensive projects are a majority of current publications

—Most-cited papers are methods and software

Researchers

—>90% of US/UK researchers use research software

—~65% would not be able to do their research without it

—~50% develop software as part of their research

See also Evidence for the importance of research software

<ReSA>
Research Software Alliance

Vision:

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

Mission:

To bring research software communities together to collaborate on the advancement of the research software ecosystem.
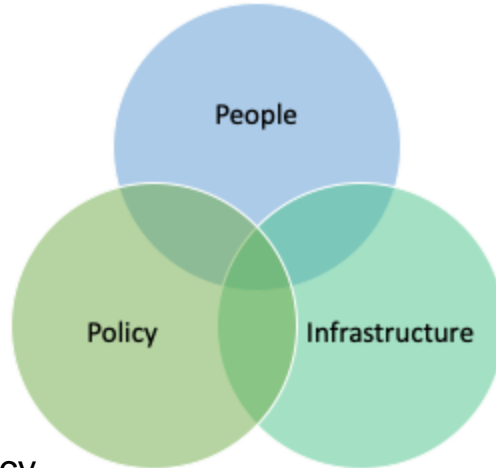
3 themes

People
- Aim: improve social infrastructure to enhance individual skills, facilitate behaviour change and support communities

Policy
- Aim: encourage and support software recognition steps by policy makers, funders, publishers and hiring institutions

Infrastructure
- Aim: identify and support needed infrastructure, including software repositories and registries, tools that enable rewards and recognition, and standards and guidelines

ReSA landscape analyses on research software

Recent blogs:

- Research software is essential for research data, so how should governments respond? (overview of international and national research software policies)
- Overview of research software funding landscape
- Encouraging entry, retention, diversity and inclusion in research software careers
- ReSA People Roadmap (included analysis of research software organisations with people-related policies)

What policies are in scope? Which are about openness?

✓ Research software
✓ People who develop and maintain research software, including Research Software Engineers

- Open source software
- Software licensing (not necessarily open)
- Open science (open software is one of the pillars)
- FAIR (Findable, Accessible Interoperable, Reusable) research outputs
- Research skills and training
- Research assessment reform (e.g., DORA)
- Research infrastructure
- Research data (can include data analysis/methods/tools)
- ….

Policy landscape - International

2021: OECD Council [Council Recommendation on Access to Research Data from Public Funding](#):
- This legal instrument was revised to include software.
- Recommends fostering (and requiring where appropriate) the adoption of good practice for research data and **software** management across the research system, promoting data and software citation in academic practice (including the development of citation standards), training a cadre of **research software engineers** and enabling recognition and reward of **software development skills**.

2021: UNESCO [Recommendation on Open Science](#):
- Defines open scientific knowledge as: open access to scientific publications, research data, metadata, open educational resources, **software, and source code** and hardware that are available in the public domain or under copyright and licensed under an open licence.
- Argues for users to gain free access to **open source software and source code** in a timely and user-friendly manner, in human- and machine-readable and modifiable format, under an open licence. The source code must be included in the software release and made available on openly accessible repositories, and the chosen licence must allow modifications, derivative works and sharing under equal or compatible open terms and conditions.

Policy landscape - National

- France: Second French Plan for Open Science, Committee for Open Science's Free Software and Open Source Project Group
- Netherlands: NWO National Roadmap for Large-Scale Research Facilities
- UK: EPSRC policy framework on research data
- Finland: Policy for Open Research Data and Methods (draft)

Some open science strategies only cover open data /access

Policy landscape - Research institutions

Policies can be on funding, career paths/recognition, citation, access/licensing, use of Software (or Output or Data) Management Plans …

Some organisations that provide software recognition and/or RSE career paths:
- [University of Illinois](#) (USA)
- [University of Manchester](#) (UK)
- [University of Notre Dame](#) (USA)
- [University College London](#)
- [The Alan Turing Institute](#) (UK)
- [Monash University](#) (Australia)

Many organisations have policies on software licensing:
- [CERN](#)
- [Max Planck Institut](#)

Policy landscape - Other types

- Disciplinary e.g., ELIXIR Software Management Plan for Life Sciences
- Publishers: The Code Availability group is a joint ReSA task force and FORCE11 working group on publisher policies concerning code availability

- Repositories/registries: Nine best practices for research software registries and repositories
- FAIR for Research Software Principles
- FORCE11 Software Citation Principles

Sample text - for funders

Open Research Funders Group: Policy clause bank

- Requiring underlying code/software shared immediately:
  "[FUNDER NAME] expects our grantees to maximize the availability of original code and software with as few restrictions as possible. At a minimum, any original software that is required to view data or to replicate analyses underpinning research papers should be made available to other researchers at the time of publication." [Adapted from Wellcome Trust]

- Requiring code/software sharing with open licensing:
  "All newly developed code/software must be released under a permissive open source license (MIT, BSD 2-Clause, BSD 3-Clause, or Apache v2.0)." [Adapted from Chan Zuckerberg Initiative]

Where are we now?

Examples of best practice exist - but difficult to find them
- FAIRsharing is a curated, informative and educational resource on **data** and metadata standards, inter-related to **databases and data policies**.
  - we need this kind of resource for software

Very fragmented landscape:
- International/national/institutional policy rarely aligned
- May focus only on specific areas (e.g., licensing, citation, career paths)

Discussion on policies for research software

Are you aware of policies concerning research software at international, national, organisational and/or discipline specific level?