

Software sustainability

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DAY 3

Software Sustainability

Learning outcomes

Why software sustainability is important

Considerations for building software sustainability

How to improve sustainability of software

Event horizon telescope

- How was this image made?



Event horizon telescope

- Distributed observations
- Earth-sized telescope dish
- Data integration by **software!**

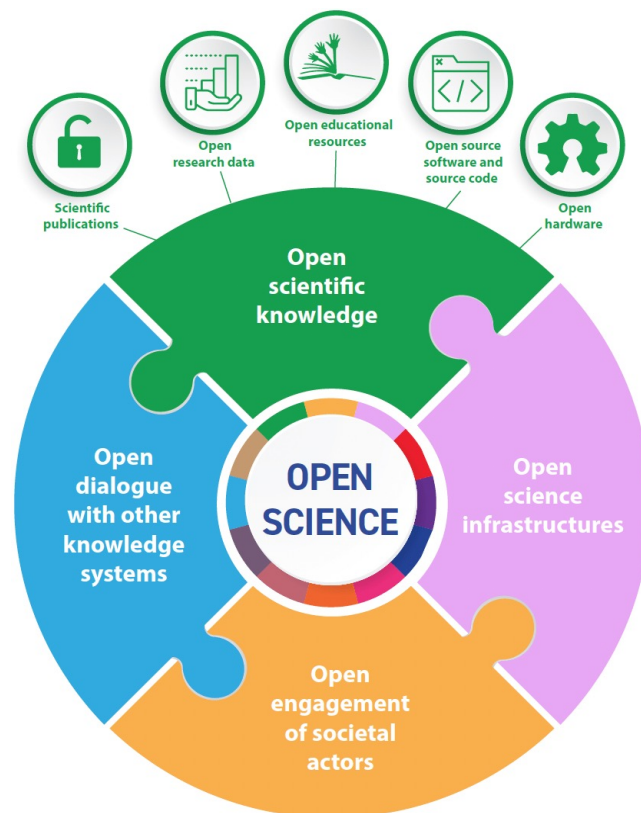


Credit: Event Horizon Telescope Collaboration



Research software is crucial for today's academic research

Open source software included in UNESCO recommendations on open science

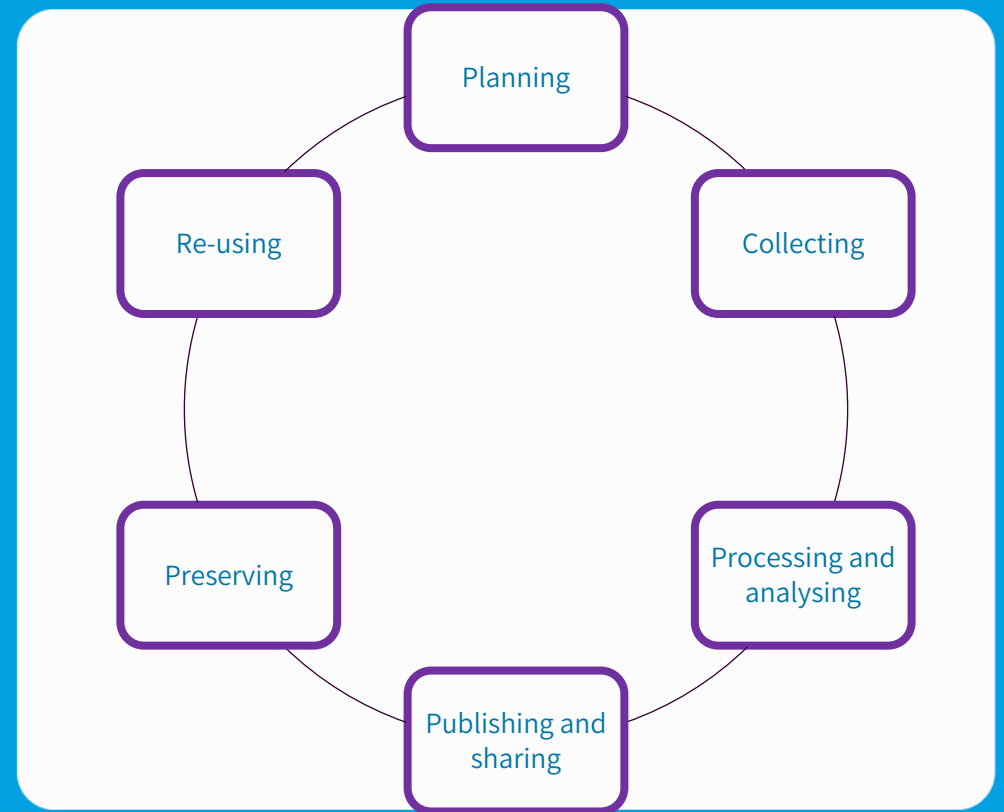


Various studies highlight importance of research software, but attention for software management is still limited



Phase in the Research Life Cycle

- Where does software fit in?



The roles of research software



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

Software classification

ANALYSIS CODE

capture research processes and methodology:
the steps taken for tasks like data generation,
preparation, analysis and visualisation

PROTOTYPE TOOLS

demonstrate a new idea, method
or model for research

RESEARCH SOFTWARE INFRASTRUCTURE

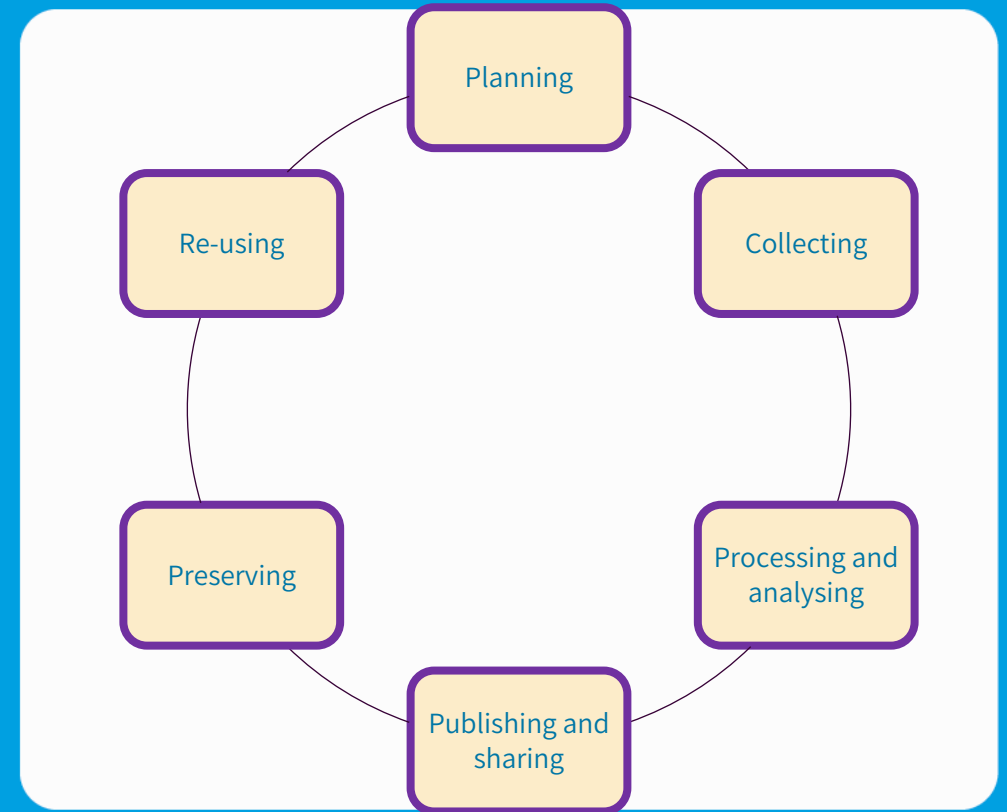
capture more broadly accepted and used ideas,
methods and models for research



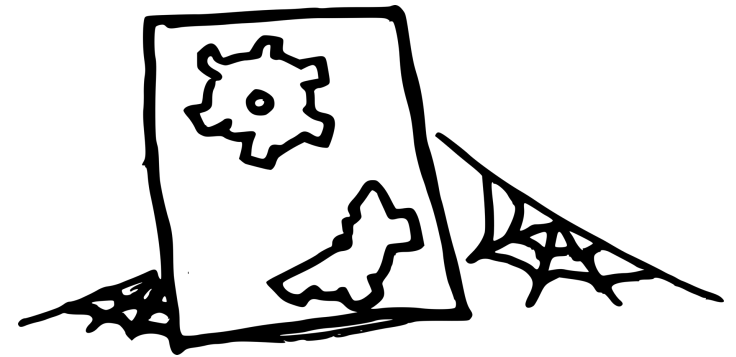
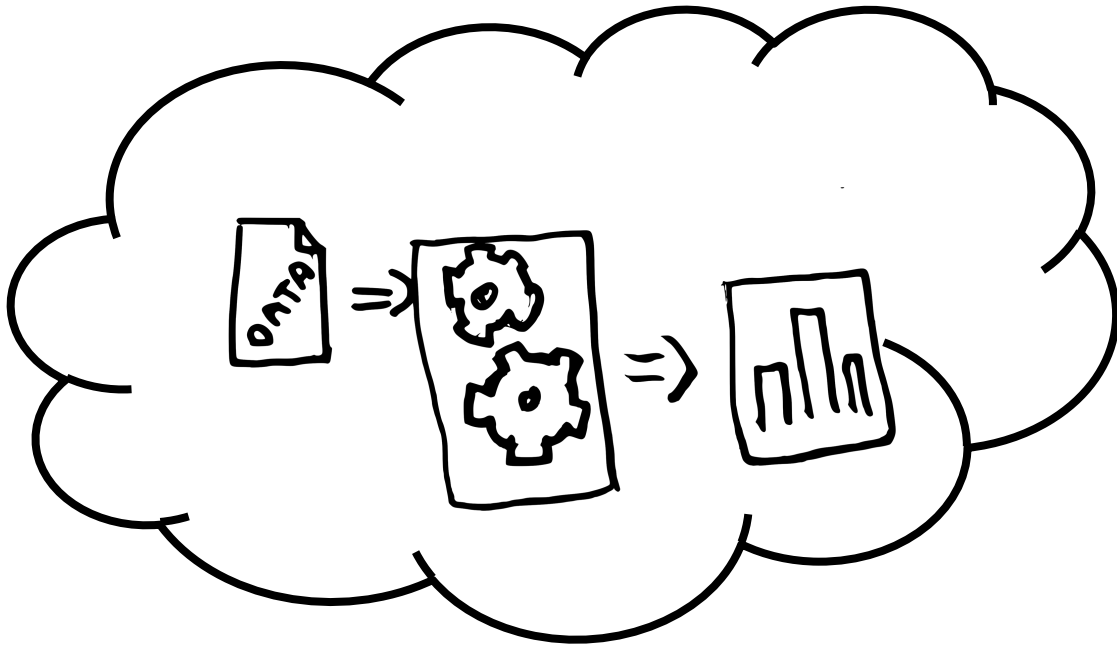
Australian Research Data Commons

Phase in the Research Life Cycle

- Software is can be found at any stage of the research process



Software breaks over time



Manage your software

- Is there software we can already use/adapt?
- How easy is it for others to take and use?
- Who will use the software afterwards?
- How will they use it?
- **NOT** another bit of admin: software management leads to better science!

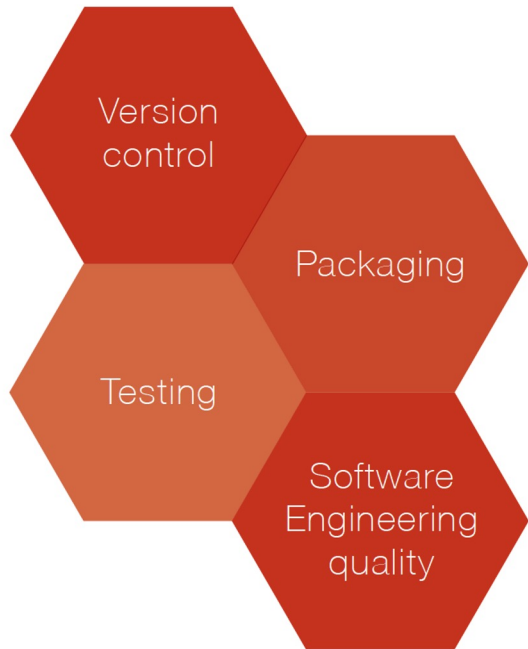
doi: [10.5281/zenodo.7038280](https://doi.org/10.5281/zenodo.7038280)

Practical guide to
Software
Management
Plans



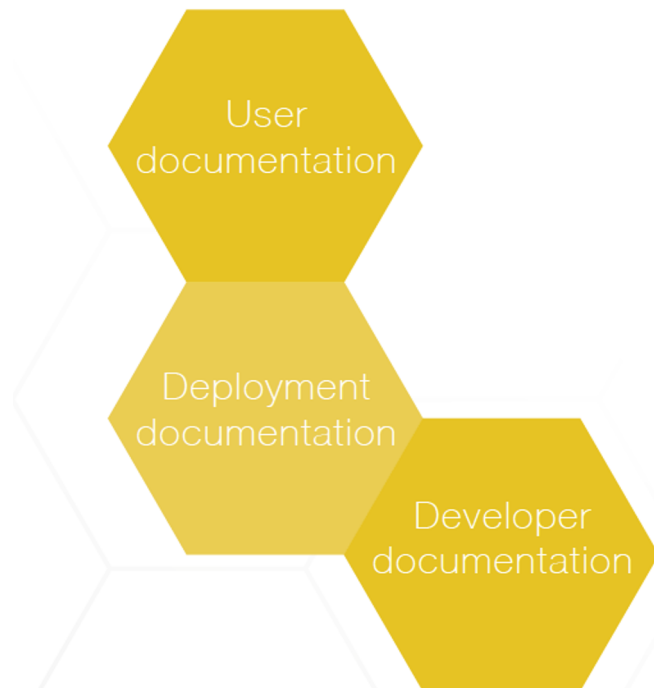
SMP requirements

Engineering Focus



Purpose

Documentation

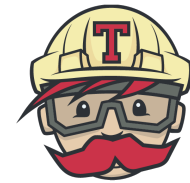
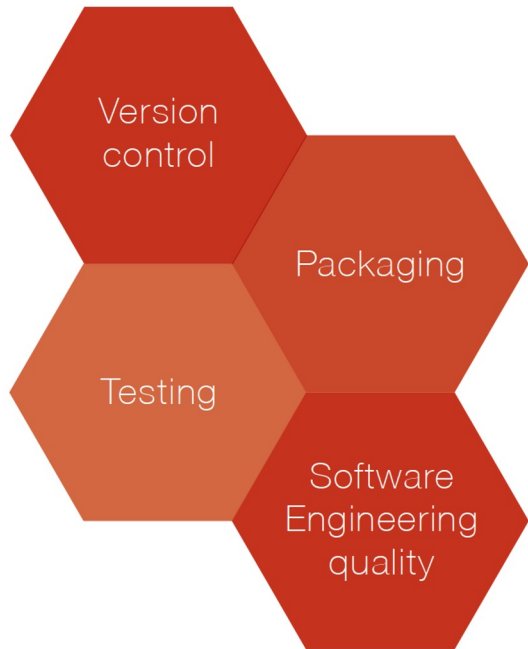


Project management focus



SMP requirements

Engineering Focus



SMP requirements

Documentation

User
documentation

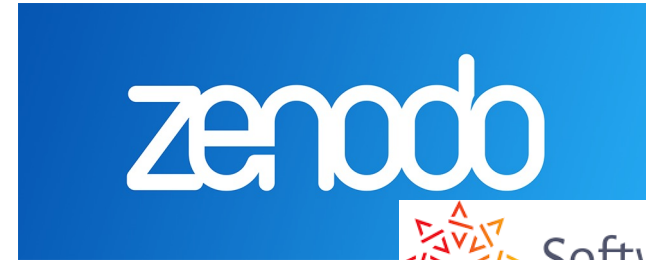
Deployment
documentation

Developer
documentation



SMP requirements

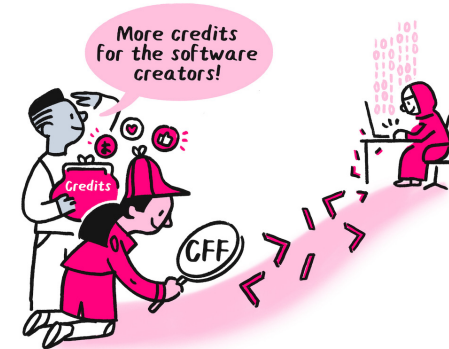
Project management
focus



Software Heritage



THE
APACHE[®]
SOFTWARE FOUNDATION
— ESTABLISHED 1999 —



Quick overview of requirements

- Version control → <https://the-turing-way.netlify.app/reproducible-research/vcs.html>
- Testing → <https://the-turing-way.netlify.app/reproducible-research/testing/testing-guidance.html>
- Packaging → <https://the-turing-way.netlify.app/reproducible-research/renv/renv-package.html>
- Documentation → https://guide.esciencecenter.nl/#/best_practices/documentation
 - User
 - Deployment
 - Developer
- Citation → <https://the-turing-way.netlify.app/communication/citable/citable-cff.html#cm->
- Software licensing → <https://the-turing-way.netlify.app/reproducible-research/licensing/licensing-software.html>
 - and compatibility → <https://the-turing-way.netlify.app/reproducible-research/licensing/licensing-compatibility.html>



DAY 3

Software Sustainability

Take aways

Software is found in all stages of research life cycle

Software management leads to better science

This is the tip of the iceberg – reach out if you need help!

Let's stay in touch



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