Software Management Plans as a Path to Sustainable and Reproducible Research Software – Potentials, Discussions and Obstacles in Dealing with Code in Science

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1. Research Software

- Software is often required for the reproducibility of scientific results or the result itself
- There are different reasons to make software available, i.e. as a autonomous publication
- DFG Guideline 13: "*Software programmed by researchers themselves is made publicly available along with the source code.*"
- Internal guidelines and/or general regulations might require/recommend a software publication
- Increasing focus on software by third-party funders as an important project outcome

2. Objectives for SMPs

- Low-threshold offer for the software project organisation with a focus on science
- Management tool to promote explicit use of research software
- SMP-Definition by DINI/nestor:
  "*A software management plan (SMP) contains general and technical information about the soft-ware project, information on quality assurance, release and public availability as well as legal and ethical aspects that affect the software.*"
  (https://forschungsdaten.info/praxis-kompakt/english-pages/software-management-plans/)

3. Advantages Through SMP Use

- Transforming implicit knowledge into explicit knowledge
- Tool for project management with focus on research software
- SMP as a service for scientists and research software engineers
- Use for consulting services, e.g. by local IT, scientific computing unit, third-party funding office
- Quality management and assurance
- Third-party funding applications
- Better overview of software project in an organisation

4. SMP User Groups

Scientists, who:
- have not yet dealt much with software management
- would like to achieve quality in research software with little time investment

Information specialists from:
- IT, Scientific Core Unit
- Third-party funding applications
- Project and quality management
- Research coordination

5. Discussions about SMPs

- Chue Hong et al. (2014): "Writing and using a software management plan", https://www.software.ac.uk/resources/guides/software-management-plans.
- Martinez-Ortiz et al. (2022): Practical guide to Software Management Plans, https://doi.org/10.5281/zenodo.7248877.
- Giraldo et al. (2023): Workshop machine-actionable Software Management Plans. https://doi.org/10.5281/zenodo.8087357.
- Grossmann and Franke: "Software ist kein Beiprodukt! Nachhaltige Forschungssoftware durch Software-Management-Pläne", in: b.i.t. online 26/5 (2023, pp. 457–463.

6. Some Available SMPs Tools

- ELIXIR
  - In https://smw.ds-wizard.org
  - https://doi.org/10.37044/osf.io/k8znb
- PRESOFT
  - https://dmp.opidor.fr
  - https://doi.org/10.5281/zenodo.1405614
- RDMO
  - i.e. on https://rdmo.mpdl.mpg.de
  - https://doi.org/10.17617/2.3496327
- Train-the-Trainer materials for teaching SMPs: https://doi.org/10.5281/zenodo.10197107

7. RDMO SMP Project by MPDL

- Team from MPDL Collections
- Result: CC0 push of an SMP catalogue as a contribution to the RDMO community
- Title: Software Management Plan for Researchers
- In German and English
- From 9 to 50 questions
- With CC0 on https://github.com/rdmorganiser/rdmo catalogue available
- All questions are also available as .docx via https://doi.org/10.17617/2.3481986

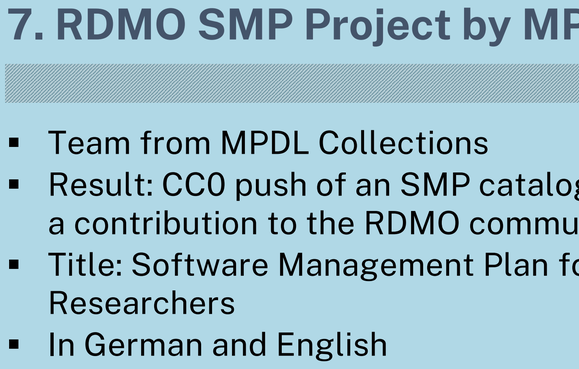
8. Structure RDMO SMP Catalogue

1. General
   - a.o. persons involved, resources
2. Technical information
   - a.o. code, infrastructure, security
3. Quality assurance
   - Testing, documentation, etc.
4. Release and public availability
   - a.o. releases, metadata
5. Legal and ethical issues
   - a.o. copyright, licenses, dual use

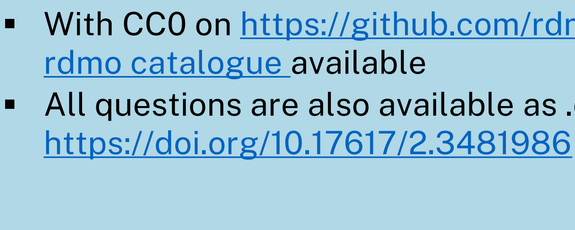
9. Special Features from RDMO SMP

- Open Source
  - Free to use without any restrictions
  - Set-up for your own or use existing infrastructure
  - Continuous maintenance by the community
  - No vendor login, instead many open export and import options
  - Own contributions to the community are welcome
- Individual customisation, especially the help text, for your own institution
- Scaling of the scope of questions
  - depending on the complexity of the software (from simple plot to large infrastructure)
- FAIR4RS-Viewer in RDMO available to FAIRify your research software

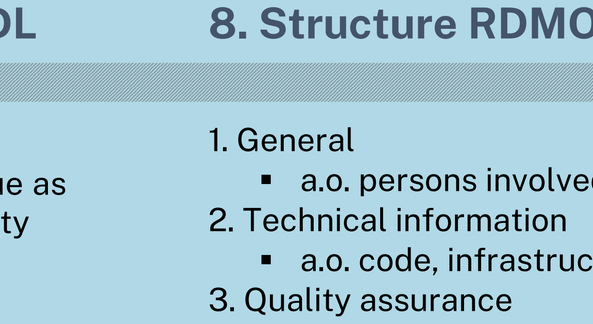
10. Selected Screenshots



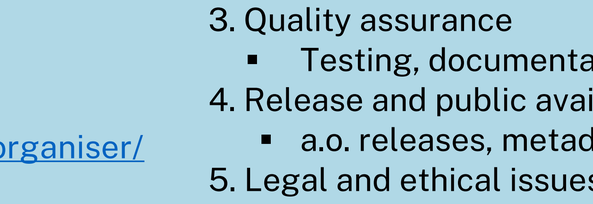
Question on monitoring external components



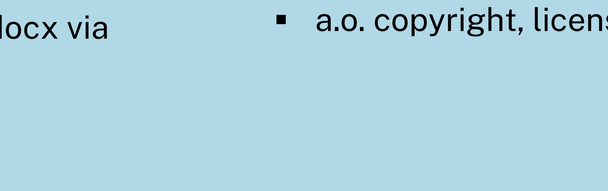
Initial question on the application class of the code and corresponding scaling of the SMP question to be answered



Question about the preconditions for software development

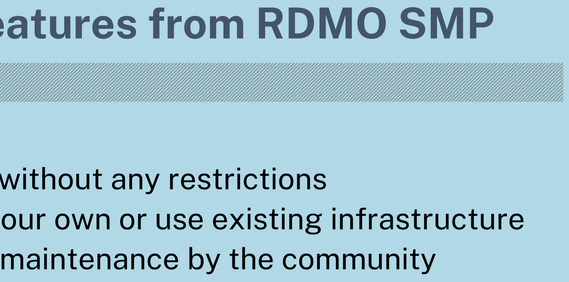


Question on coding standards

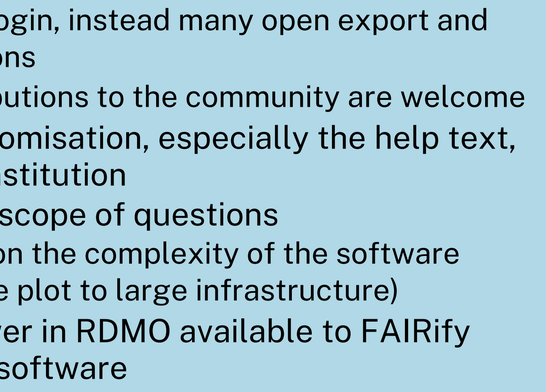


Giving information about the preservation

Questions regarding public availability



Question regarding test strategy



Section of the FAIR4RS viewer

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