

Research Software Quality Training in EVERSE

Metadata, discoverability and semantic perspectives

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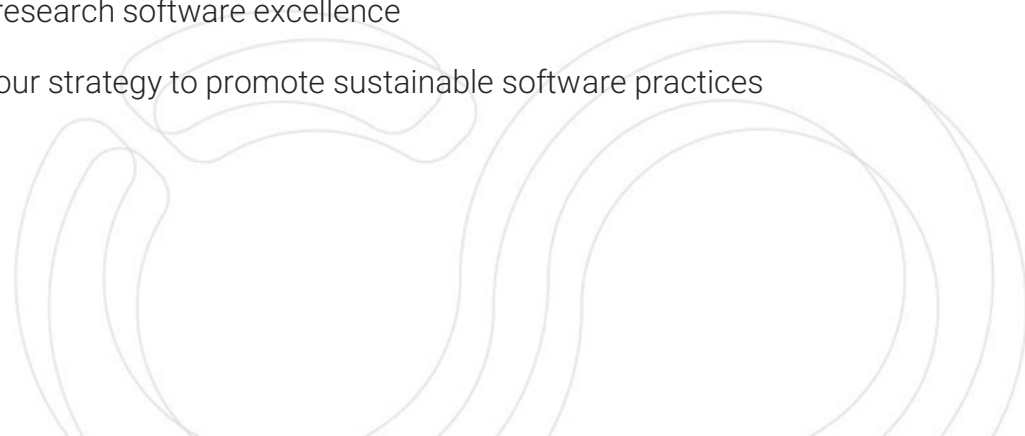


What is EVERSE ?

European **V**irtual Institute **e** for **R**esearch **S**oftware **E**xcellence

EVERSE aims to create a framework for research software and code excellence, collaboratively designed and championed by the research communities, in pursuit of building a European network of Research Software Quality and setting the foundations of a future Virtual Institute for Research Software Excellence

- ✓ ensure research software curation, quality, preservation and adoption of best practices, by the Communities, for the Communities, build on collaboration with the five EOSC Science Clusters
- ✓ adopt a three-tier model for research software, i.e., analysis code, prototype tools and research software infrastructure, which captures the varying complexity of research software and its development, and can be used as a basis for research software excellence
- ✓ credit and recognition for both developers and software are essential components of our strategy to promote sustainable software practices



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Research Software across scientific disciplines ; Pilots & Drivers



Environmental Sciences: *Integration of Science Cluster ENVRI-Community through ENVRI-HUB*

- Integrate EVERSE framework into the ENVRI-HUB Knowledgebase and Virtual Research Environment
- Apply to the development of the Essential Climate Variable computing program and cloud workflows



Life Sciences: *Integration of Science Cluster Life Science RI through ELIXIR*

- Make RO-Crate actionable by incorporating the five safes concept into WfExS for secure and federated workflow orchestration
- Use of community-led standards for materialising research software packaged using container technologies and mobilising encrypted data whenever needed



Astronomy and particle physics: *Integration of Science Cluster ESCAPE through the Dark Matter Test Science Project*

- ML for scientific data compression (standalone code, python)
- A Common Tracking Software
- Choose an ATLAS trigger algorithm as an option for the collaboration



Photon and neutron science: *Integration of Science Cluster PaNOSC through LEAPS/LENS*

Transition software to high performance computing (HPC) and heterogeneous computing architectures



Social sciences: *Integration of Science Cluster SSHOC*

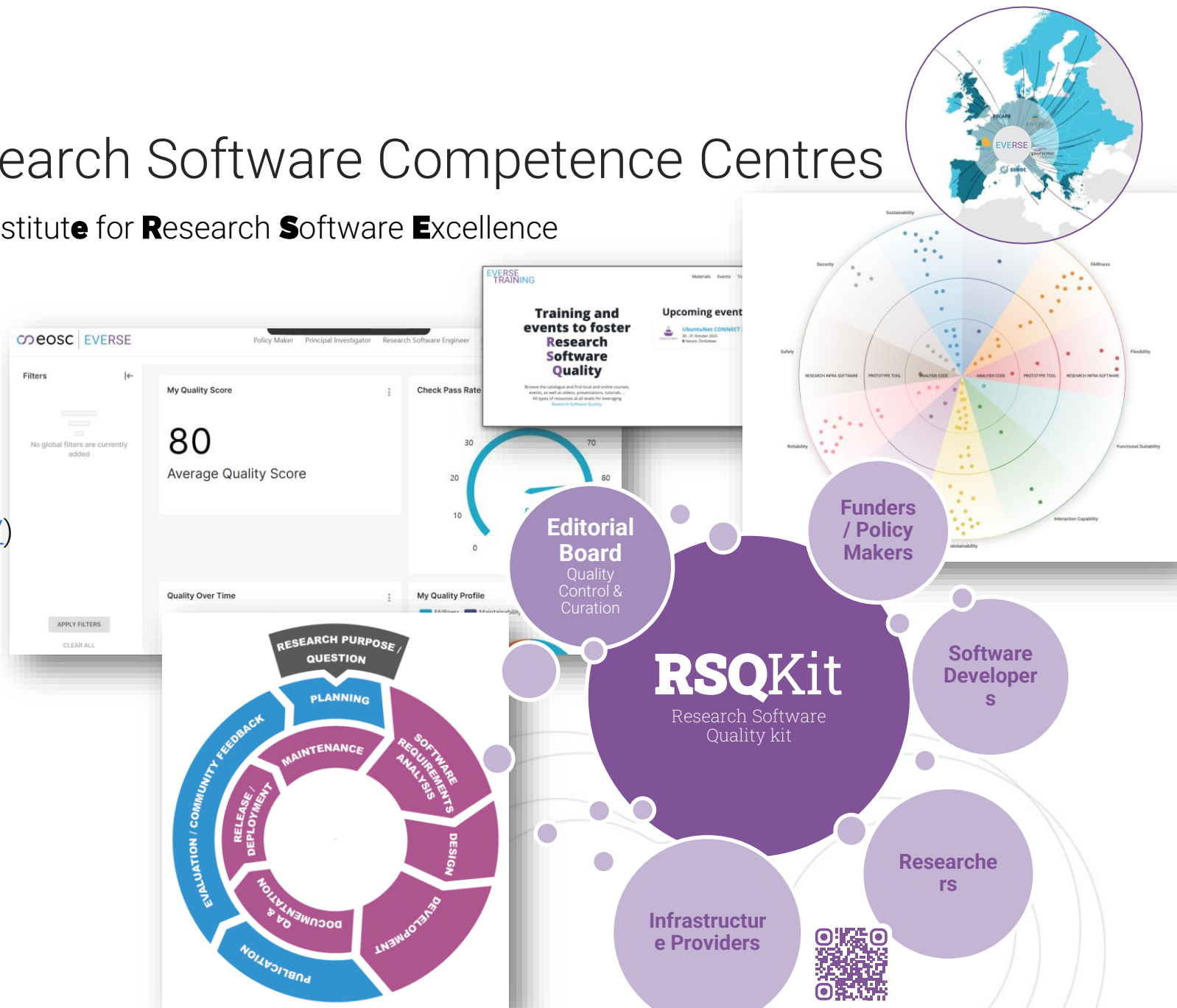
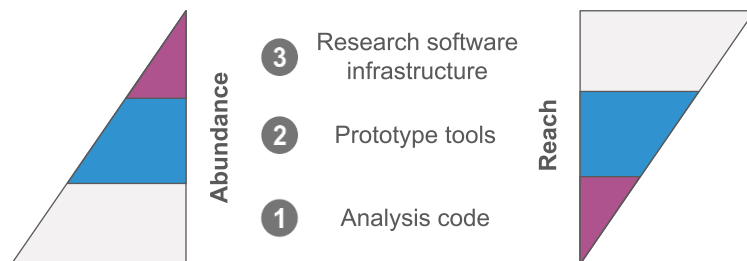
Develop a multilanguage textual analysis pipeline of tools that use a combination of open source tools and own code to create an integrated SotA tool capable of deploying locally or as a service

Building a Network of Research Software Competence Centres

Paving the way towards a **E**uropean **V**irtual Institute for **R**esearch **S**oftware **E**xcellence

Key EVERSE services

1. RSQKit (everse.software/RSQKit/)
2. TechRadar ([EVERSE Technology Radar](#))
3. [EVERSE Software Quality Pipelines](#)
4. DashVERSE (<https://www.dashverse.cloud/>)
5. Training ([EVERSE Training](#))
6. Recognition framework
7. Network (everse.software/network/)



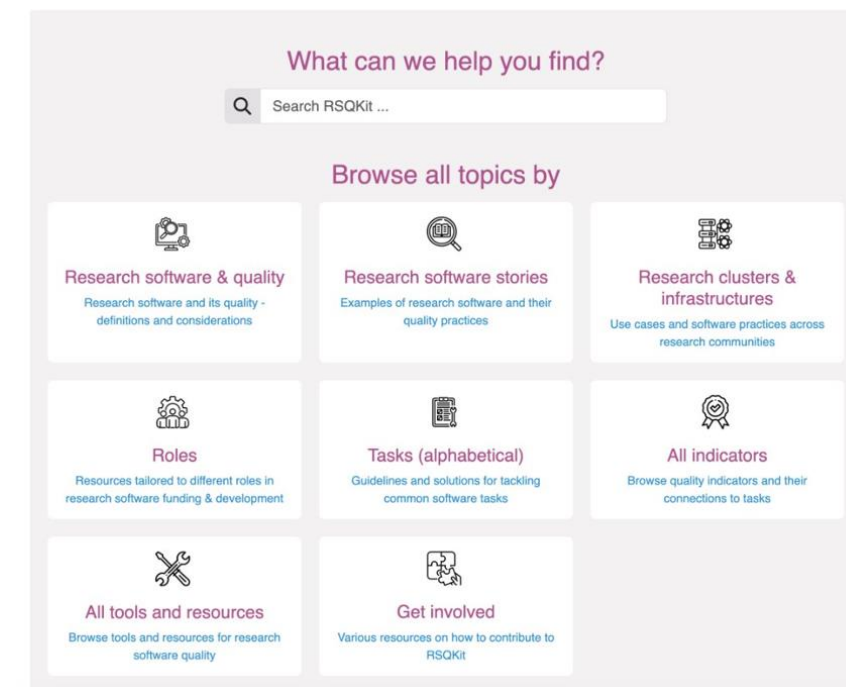
EVERSE Tools and Services

An ecosystem around research software quality

- **RSQKit**: task-driven guidance for common research software quality practices
- **Quality tools**: indicators, pipelines, dashboards and tools to evaluate and improve quality
- **EVERSE Training**: a catalogue for training materials and events related to research software quality
- **Recognition**: credit and visibility for software and training contributions

Research Software Quality Toolkit (RSQKit)

Tasks, tools, stories, and resources to support your research software to be repeatable, reproducible, trustworthy, resilient, understandable, efficient, adaptable and maintainable.



All code and software artefacts that are used, produced, or might be related to the research process in one or more stages of the research lifecycle, and regardless of the layer of the software stack. (inclusive description)

What is research software?

From analysis scripts to research software infrastructure



Analysis code

Small scripts and notebooks used to analyse data or produce figures.



Prototype tools

Proof-of-concept software used by more than one person or project.



Research software infrastructure

Broader tools, services and platforms embedded in research workflows.

personal

shared

infrastructure

Research software quality must work across different scales and communities.

What is Research Software Quality?

Quality means software can be understood, trusted, reused and maintained

Documentation • Testing • Versioning • Licensing

Citation • Reproducibility • Maintainability • FAIR practices

Quality is not a single action. It spans planning, development, documentation, testing, release, publication, citation, reuse and long-term maintenance.

This creates a training problem: different actors need different guidance at different points.

Training as a Supporting Layer

Not one lifecycle stage, but an enabling layer across the lifecycle



helps different actors apply quality practices at the right point



The problem is not simply producing training; it is connecting the right resource to the right user need.

The EVERSE Training Catalogue

EVERSE TRAINING

Materials Events Trainers About Log in

Home / Materials

Sort

Most recent

Filter

Date added

Scientific topic

Content provider

Keyword

Competency level

Licence

Training materials

E.g., web pages (github, blog, ...), presentations, videos, tutorials, etc., about training on any RSE-related software, standard or pipeline. Materials can be manually added or automatically harvested from a provider's website. If you are unsure whether your training material is a good fit for the current page, we warmly welcome you to contact us.

Search materials...

118 materials found

Subscribe Register training material

Results per page: 10

GITHUB PAGE
Industry Skills Agile Training
organising software project

GITHUB PAGE
Ai Fundamentals For Researchers

Search: keyword, topic, difficulty level and more

Discover: resources relevant to user roles and tasks

Showcase: trainers and providers can share resources

The catalogue is not only a repository. Its usefulness depends on metadata quality and semantic organisation.

EVERSE Training everse-training.app.cern.ch/ | A one-stop shop for research software training providers, trainers and trainees.

- The catalogue helps early career scientists and engineers who want to learn about best practices in RSE
- And it helps trainers in RSE to showcase and advertise their training resources
- Domain agnostic – we are targeting best practices and use-cases in RSE
- Materials = videos, tutorials/carpentries, webpages, courses, etc.
- Events = workshops, lectures, talks, schools, etc.
- Curated by EVERSE members



The Training Discoverability Challenge

- Training resources exist across institutions, labs, RSE groups, project websites, videos, courses and events ; without structured description:
 - Low discoverability
 - Hard to judge relevance
 - Quality and freshness are difficult to assess
 - Trainers lack visibility

Metadata is what turns a collection of links into a usable training catalogue.

Why Basic Metadata Is Not Enough

Basic description	Discovery and selection
Title	Target audience
URL	Expertise level
Description	Usage role
Author(s)	Learning outcomes
Keywords	Estimated effort
	Domain / community
	Quality criteria

Good metadata answers: “Is this the right resource for this user, at this moment, for this task?”

Learning material example

Required:

Learning Resource Type	Lecture, Presentation, Training materials
Title	HemaFAIR Lecture ...
URL to Resource	https://youtu.be/pnkFAEwlsRU?si=XUliZ19doDVyY7QI
Abstract/Description	This HELIOS and HemaFAIR webinar provides an introduction to ...
Author(s)	Dieter Hayan https://orcid.org/0000-0003-1822-9033
Keyword(s)	FAIR principles, HemaFAIR, HELIOS, Open Science, Healthcare, ...
Target Group (Audience)	Researchers, Data Scientist, Data stewards, Data managers, Students, Clinicians
Learning Outcome(s)	- Define Privacy-Preserving Record Linkage (PPRL) and its role in biomedical ...
Expertise Level	Beginner
Access Cost	[none]
Primary Language	[en]

Required if exists:

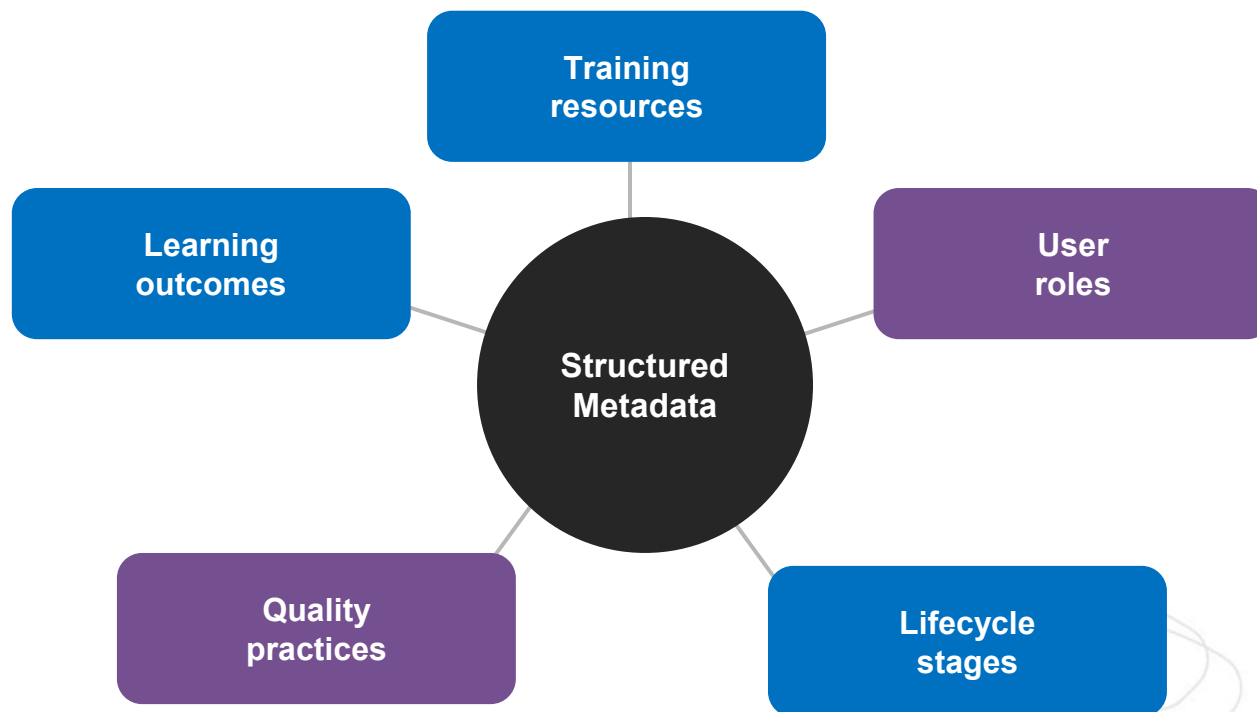
License *	Creative Commons Attribution 4.0 International
DOI *	https://doi.org/10.5281/zenodo.20391927

Recommended:

Contributor(s)*	Petros Kountouris, Sotiroula Chatzimatthaiou https://orcid.org/0000-0003-2681...
Content Provider	EVERSE TeSS
External Resources	Link to a tool: https://...

Metadata as a Semantic Layer

Connecting resources, users, tasks, quality practices and learning outcomes



Take-Home Messages

Training turns quality principles into everyday research practice

1. EVERSE context — Research software quality requires guidance, tools, training and recognition.

2. Metadata matters — Metadata improves discovery, selection and reuse of training resources.

3. Semantic perspective — Structured metadata connects resources to roles, tasks, lifecycle stages and outcomes.

The same discoverability logic can support research software training and broader software-enabled digital/data services.



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Thank you!

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FOSSTodon: https://fosstodon.org/@eosc_verse



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