

EVERSE

Paving the way towards a European Virtual
Institute for Research Software Excellence

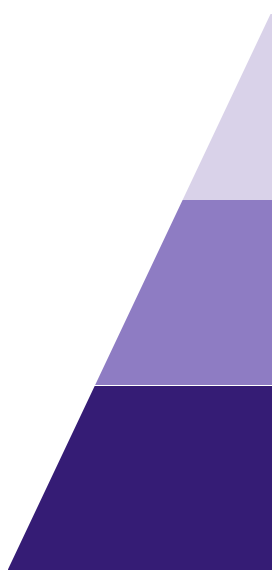
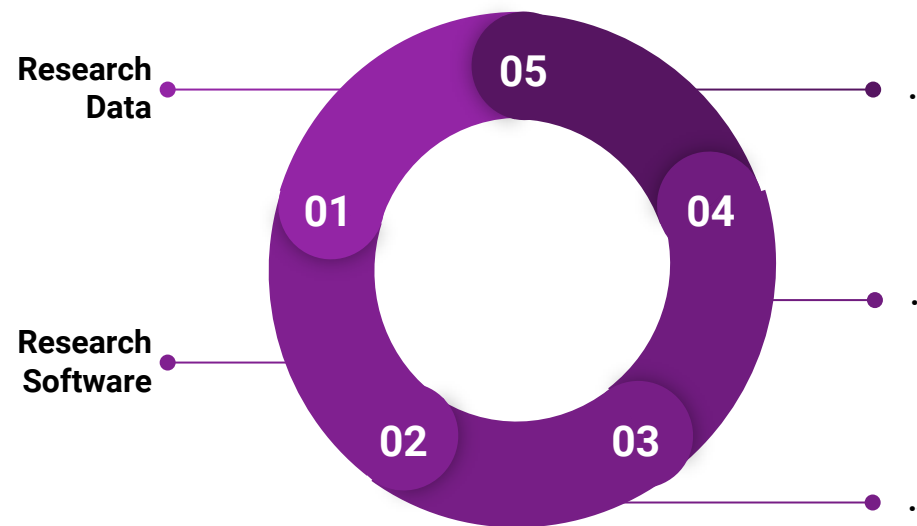


**Funded by
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18 | 02 | 2025 by Fotis Psomopoulos (INAB|CERTH)



Research Software as a first-class citizen for the scientific endeavours



abundance

- 1 Research software infrastructure**
It involves research software that captures more broadly accepted and used ideas, methods and models for use in research, and warrants close researcher involvement in their development.
- 2 Prototype tools**
It refers to research software that demonstrates a new idea, method or model for use by others outside the project within which it originated, often as a substantive intellectual contribution in its own right and often in the form of a proof of concept.
- 3 Analysis code**
It includes research software that captures computational research processes and methodology, and often occurs in the context of simulation, data generation, preparation, analysis and visualisation.

Foundational Software



Importance

Not all software has the same level of importance

eosc | EVERSE

IEEE
Advancing Technology
for Humanity

ENVRI
Community

LIFE SCIENCE RI

panosc
photon and neutron
open science cloud

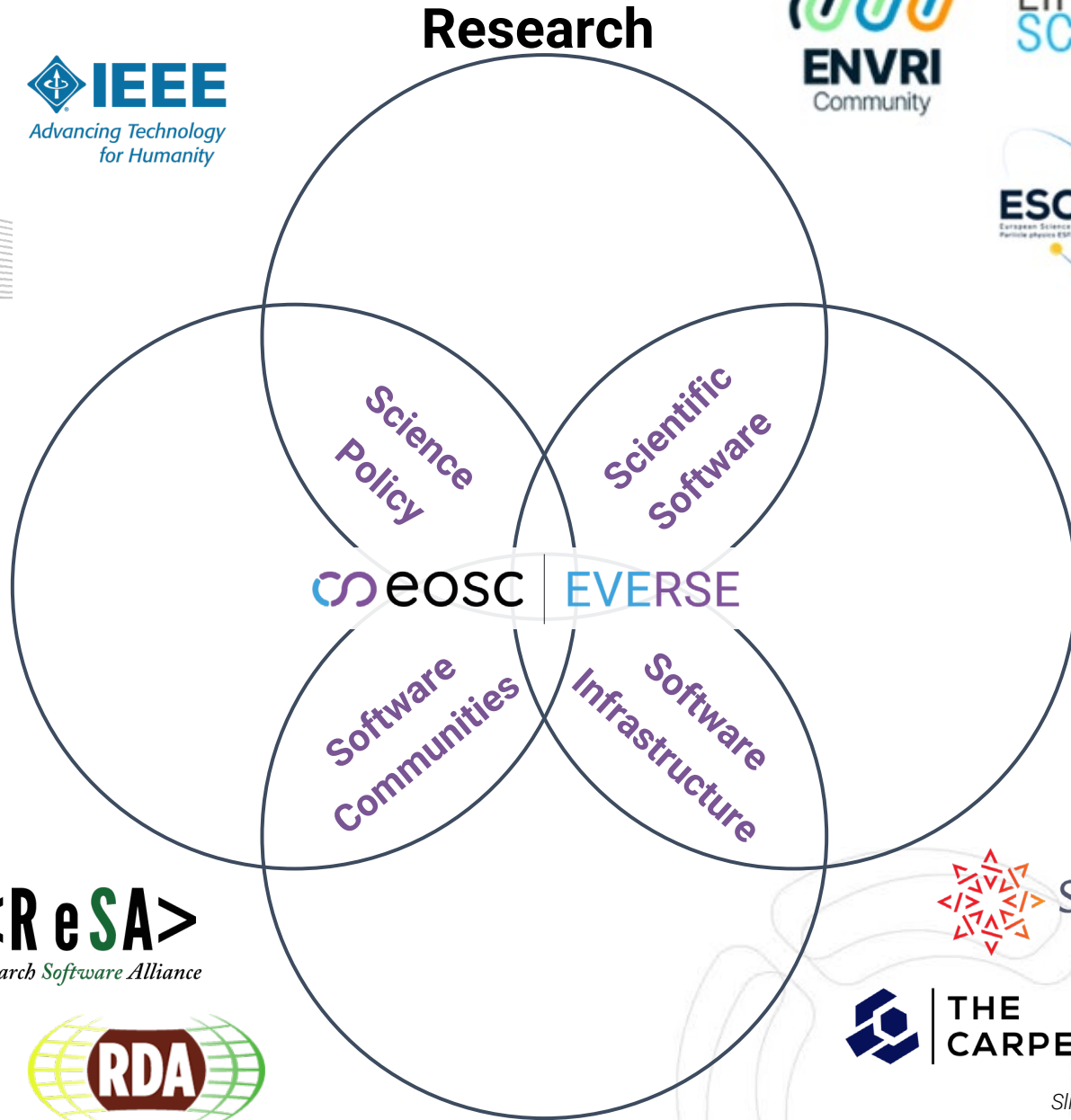


ESCAPE
European Science Cluster of Astronomy &
Particle physics (ESCAP) research infrastructure

SSH OpenCluster
Social Sciences & Humanities Resources

eosc

Leadership



Bioconductor
OPEN SOURCE SOFTWARE FOR BIOINFORMATICS

julia

PyTorch

Software

SCIENCE FOR AFRICA FOUNDATION

RSE

eosc | EVERSE

NUMFOCUS
OPEN CODE = BETTER SCIENCE

<ReSA>
Research Software Alliance

Software Heritage

Software Sustainability Institute

RDA
RESEARCH DATA ALLIANCE

THE CARPENTRIES

Open Life Science

EVERSE: European Virtual Institute for Research Software Excellence

Communities

Slides adapted from the "OrgMycology - eResearch NZ 2024" by Jonah Duckles (orgmycology)

ORGANIZATIONAL MYCOLOGY

EVERSE

Paving the way towards a European **V**irtual Institute 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

Mar/2024



Feb/2027 (36 months)

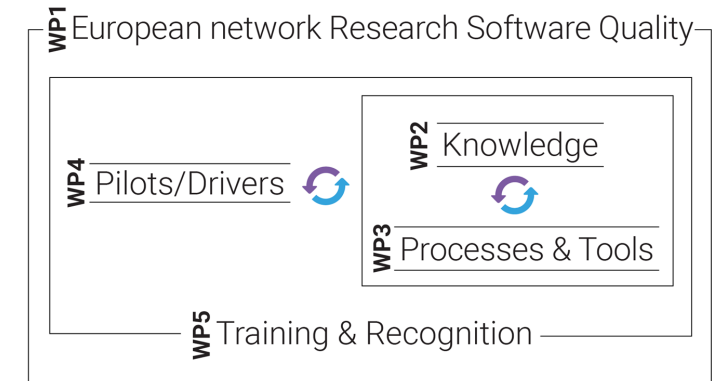
15 Beneficiaries, 1 Associated partner & 2 Affiliated entities

Coordinated by CERTH and BSC

Partners, associates, and affiliated entities



Objectives



Objective #1: *Ensure that Open Science practices and skills are rewarded and taught, becoming the 'new normal'*

EVERSE will:

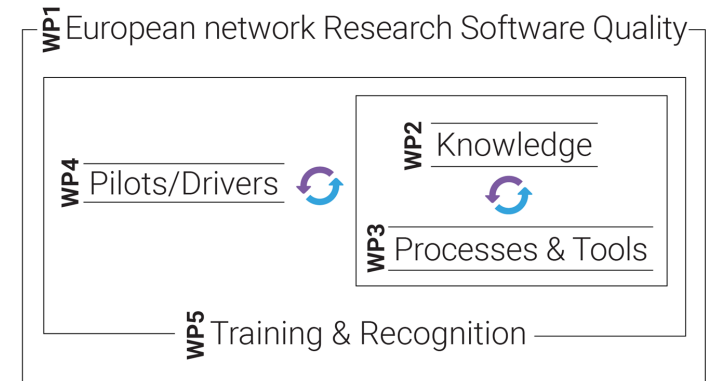
- ✓ Provide a **framework** that will ensure appropriate **recognition, reward, and career development** for researchers and RSEs who implement research software and code quality assurance practices and policies

Objective #2: *Enable the definition of standards, and the development of tools and services, to allow researchers to find, access, reuse and combine results*

EVERSE will:

- ✓ **Leverage existing tools and resources** to support the evaluation, verification and improvement of research software and code quality, based on **existing practices and standards** across research communities represented by the five EOSC Science Clusters.
- ✓ Establish a **sustainable and collaborative ecosystem of stakeholders** across the research communities associated with the five **EOSC Science Clusters** to ensure research software and code quality assurance and support the advancement of reliable and reproducible research.

Objectives



Objective #3: *Establish a sustainable and federated infrastructure enabling open sharing of scientific results*

EVERSE will:

- ✓ Build a **collaborative, community-led structure** for evaluating, verifying, and improving the quality of research software and code, by **actively involving** researchers, software developers, and other stakeholders in the research community.



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*

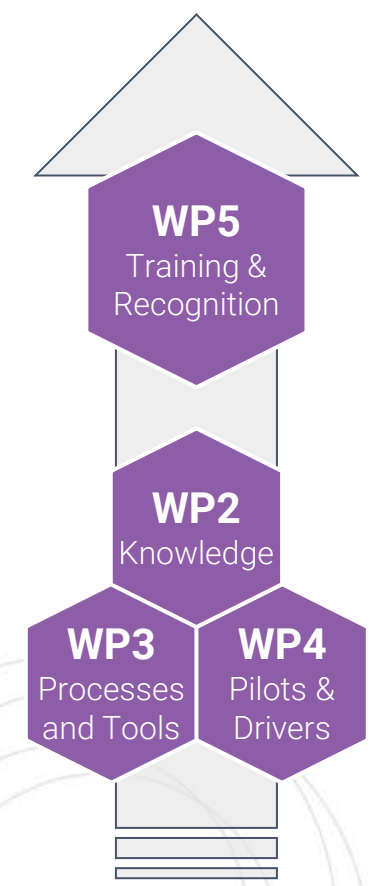
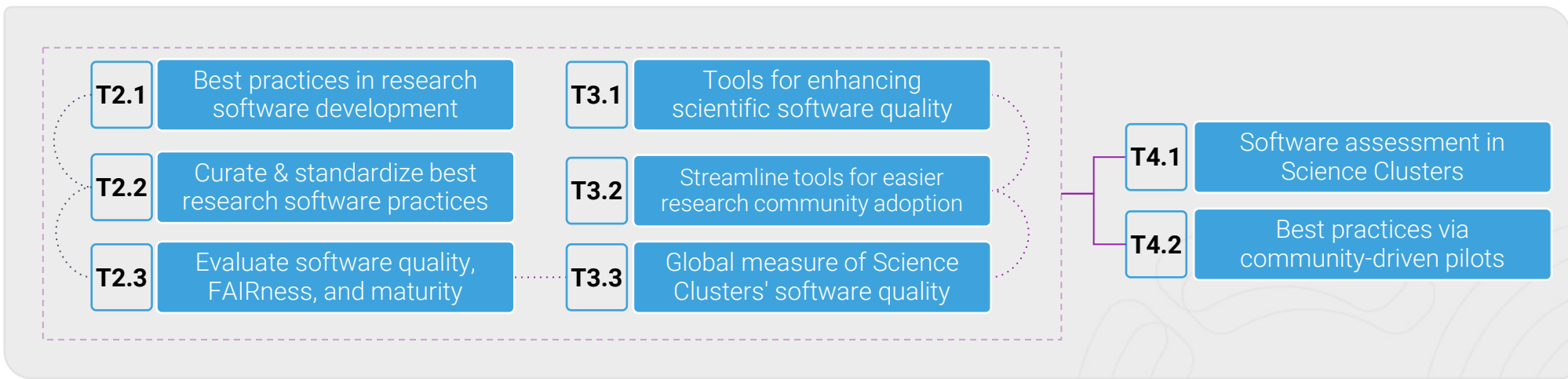
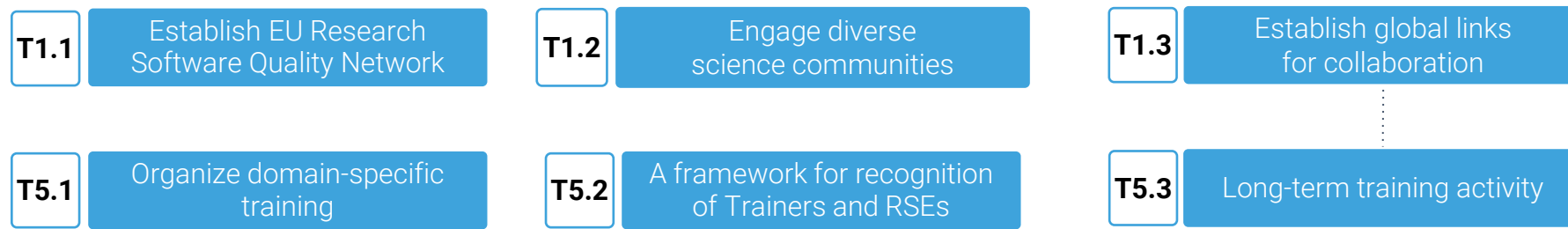
Transition software to high performance computing (HPC) and heterogeneous computing architectures



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

Technical Overview

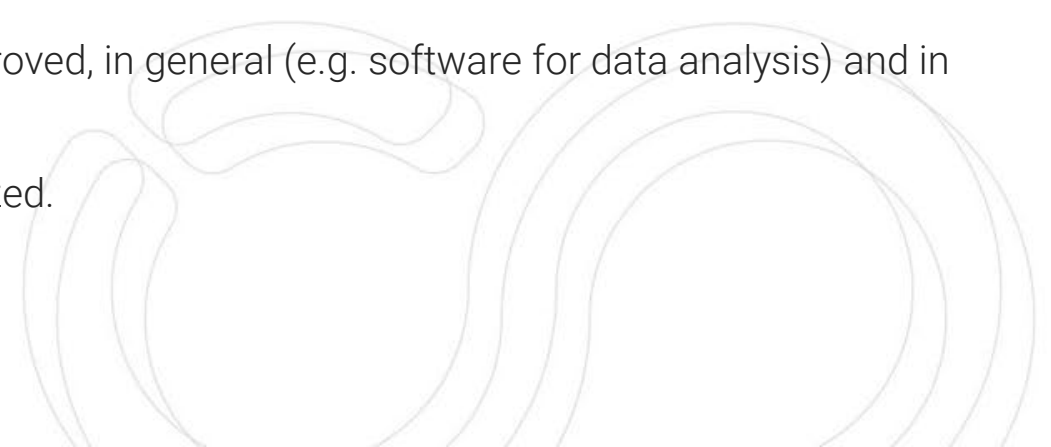


Key impacts and deliverables

- A framework of **community curation** is established and promoted that ensures **quality** of **software** and **code** across the **different disciplines**.
- **Infrastructure, tools and services** are deployed that allow researchers to properly develop, describe with proper metadata, version, archive, share and reuse research software.
- The **notion of software quality** is **defined** in the context of **EOSC** and builds upon established practices by the FAIR and other communities.
- **Baseline quality indicators** of “minimum quality” defined for the different types of digital objects targeted (software, code, etc), taking into account the concept of “**fit for purpose**”.

Expected impact

- ✓ The quality of research software (technical and organisational) improved, in general (e.g. software for data analysis) and in particular for software used in the services offered through EOSC.
- ✓ Software is developed in a sustainable way and its reuse is maximized.

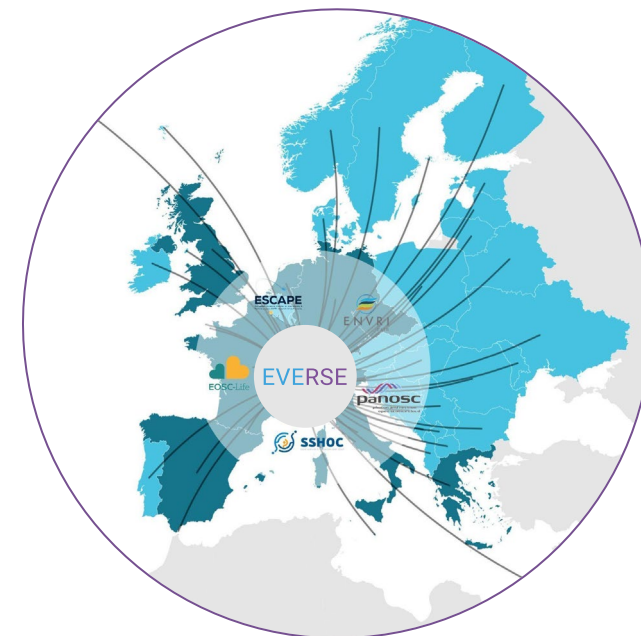
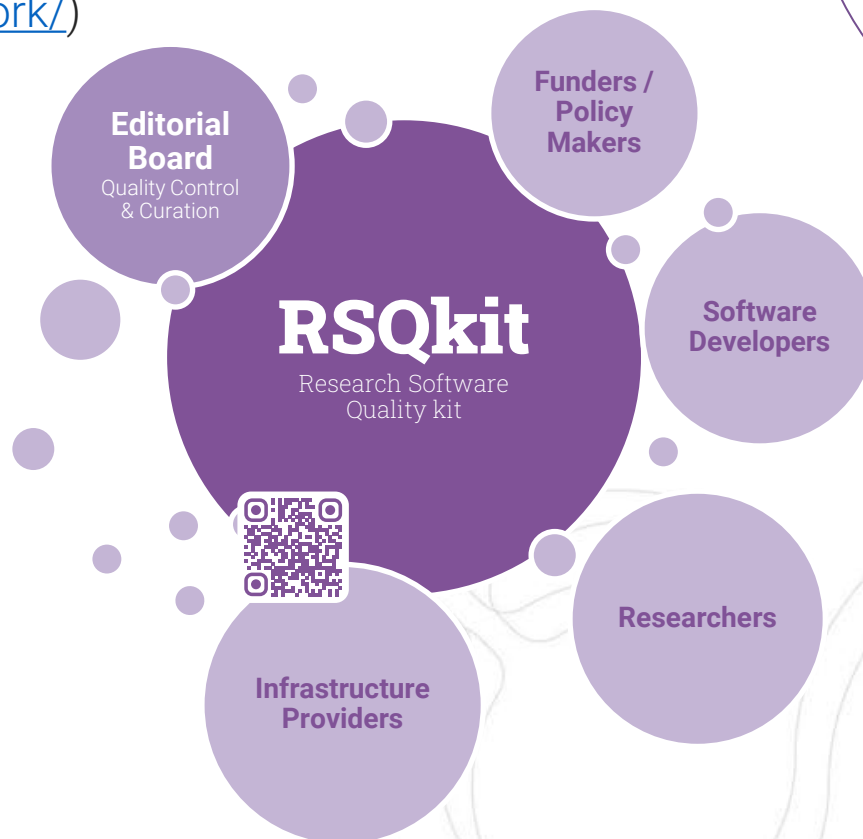
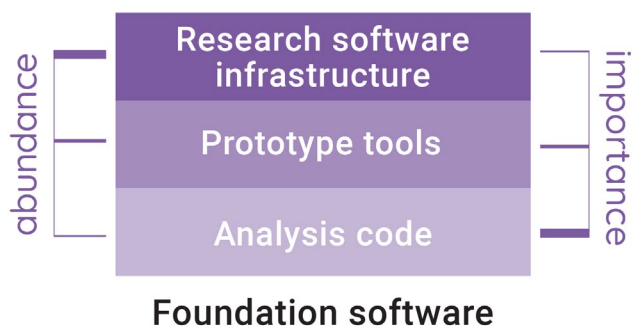


Establishing a Community

How to contribute to, and engage with EVERSE

Elements of EVERSE

- The Network (<https://everse.software/network/>)
- RSQkit (<https://everse.software/RSQKit/>)
- Software Reference model
- Training
- Recognition framework



Join Us



Any individual or organization that agrees with our vision statement is welcome to join the network

Connections and Collaborations

Immediate collaborations



related projects



projects that can benefit from/contribute to EVERSE



Global engagement

Designing a multinational Research Software event



- EVERSE and the Science for Africa Foundation agreed to have a joint event during the project's lifetime
- Now joined by the Research Software Alliance (ReSA) and the Research Software and Systems Engineers (RSSE) of Africa/Talarify
- Two-step event:
 - 1. Satellite event at an African RSE conference: workshop on assessing existing expertises as well as needs for researchers who codes, while EVERSE intergrates them into Network and offers resources
 - 2. 1-2 day event with a set of session dedicated to talks, trainings, online resources and teaching content; ideally recurring
- Aim is to merge both RSE movements, help and learn from each other

Thank you!

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LinkedIn: <https://www.linkedin.com/company/eosc-everse/>

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



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