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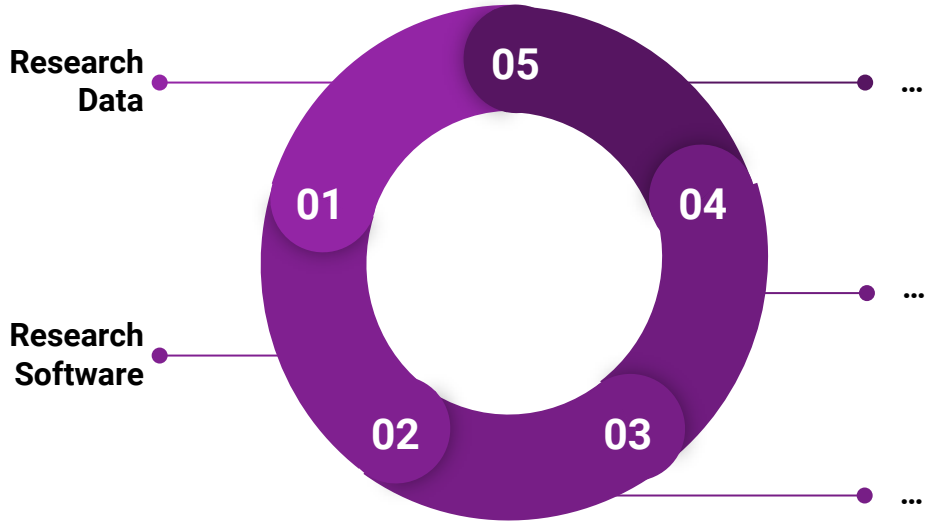
EVERSE

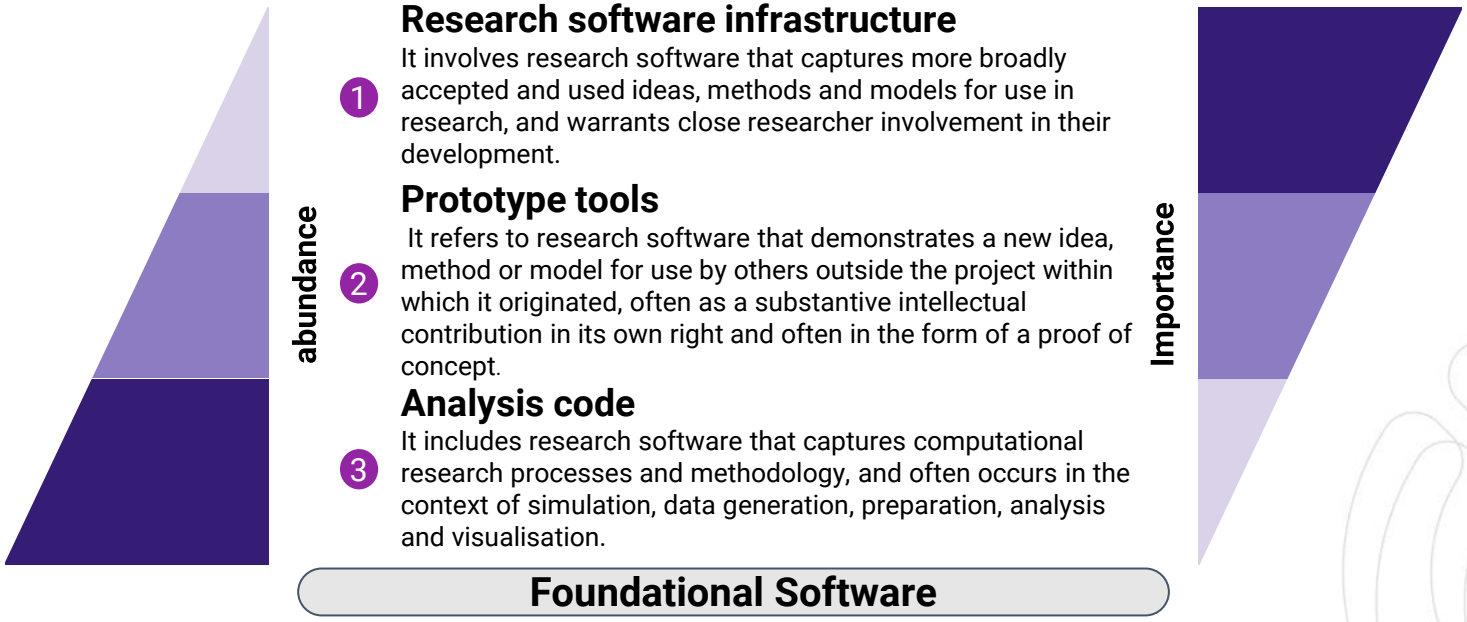
Paving the way towards a European Virtual Institute for Research Software Excellence

Funded by the European Union

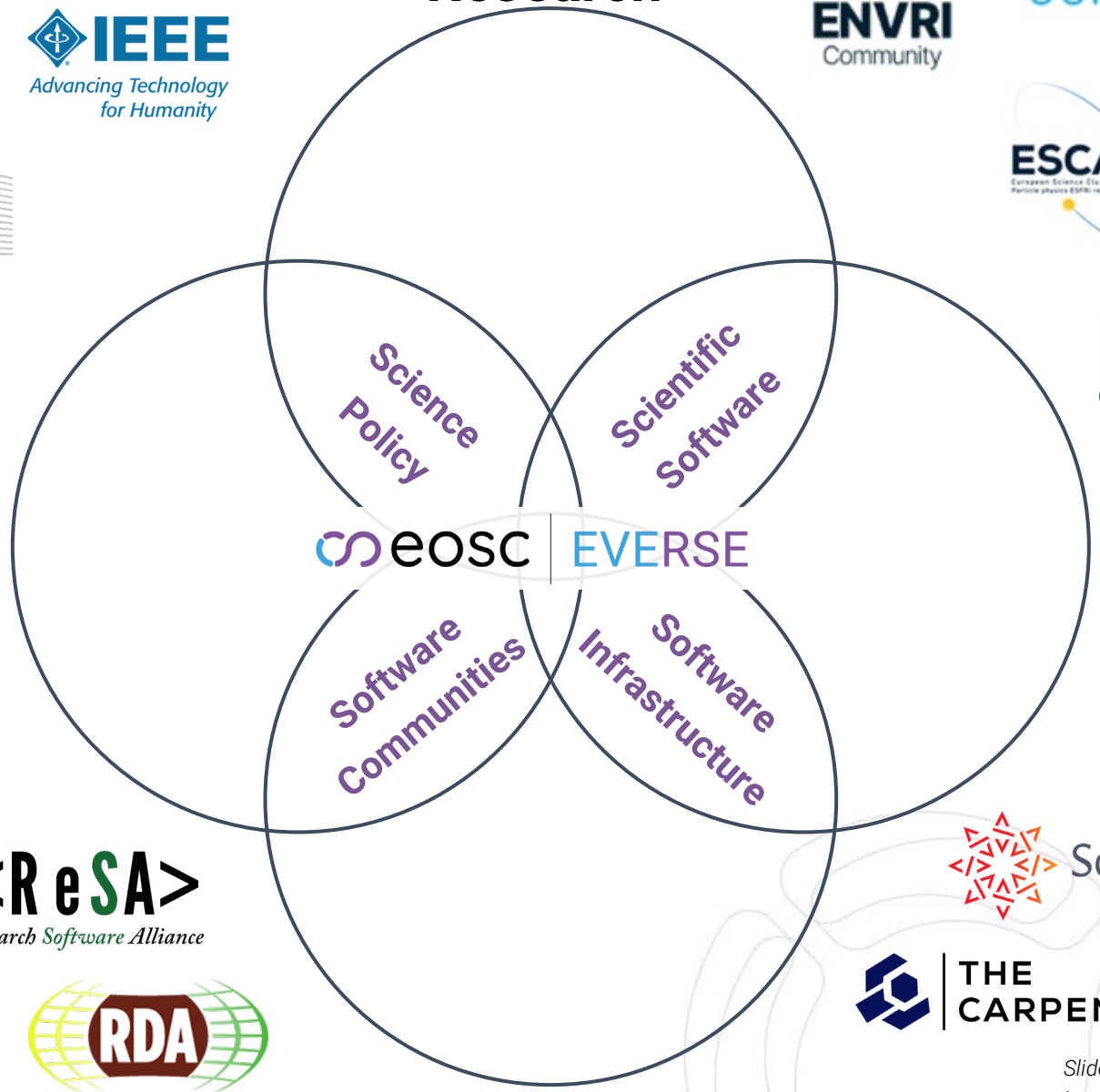
10 | 02 | 2025 by Fotis Psomopoulos (INAB|CERTH)

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





Not all software has the same level of importance



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IEEE Advancing Technology for Humanity

ENVRI Community

LIFE SCIENCE RI

panosc photon and neutron open science cloud

European Commission

ESCAPE

SSHOpenCluster Social Sciences & Humanities Resources

eosc

Bioconductor OPEN SOURCE SOFTWARE FOR BIOINFORMATICS

julia

PyTorch

SCIENCE FOR AFRICA FOUNDATION

RSE

NUMFOCUS OPEN CODE = BETTER SCIENCE

<ReSA> Research Software Alliance

Software Heritage

Software Sustainability Institute

THE CARPENTRIES

Open Life Science

RDA RESEARCH DATA ALLIANCE

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

EVERSE: European Virtual Institute for Research Software Excellence

ORGANIZATIONAL MYCOLOGY

EVERSE

Paving the way towards a **E**uropean **V**irtual Institut**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

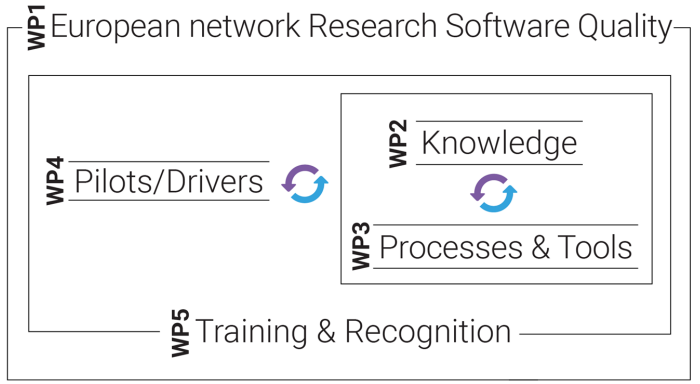
Mar/2024 → Feb/2027 (36 months)

15 Beneficiaries, 1 Associated partner & 2 Affiliated entities

Coordinated by CERTH and BSC

Partners, associates, and affiliated entities

Objectives



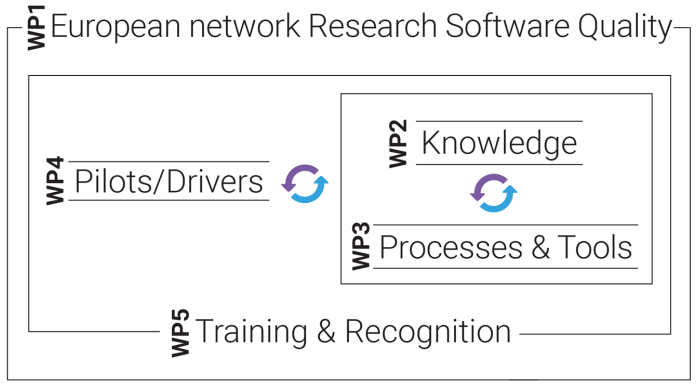
Objective #1: *Ensure that Open Science practices and skills are rewarded and taught, becoming the 'new normal*
EVERSE will:

- ✓ 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 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 EOSC-Life 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

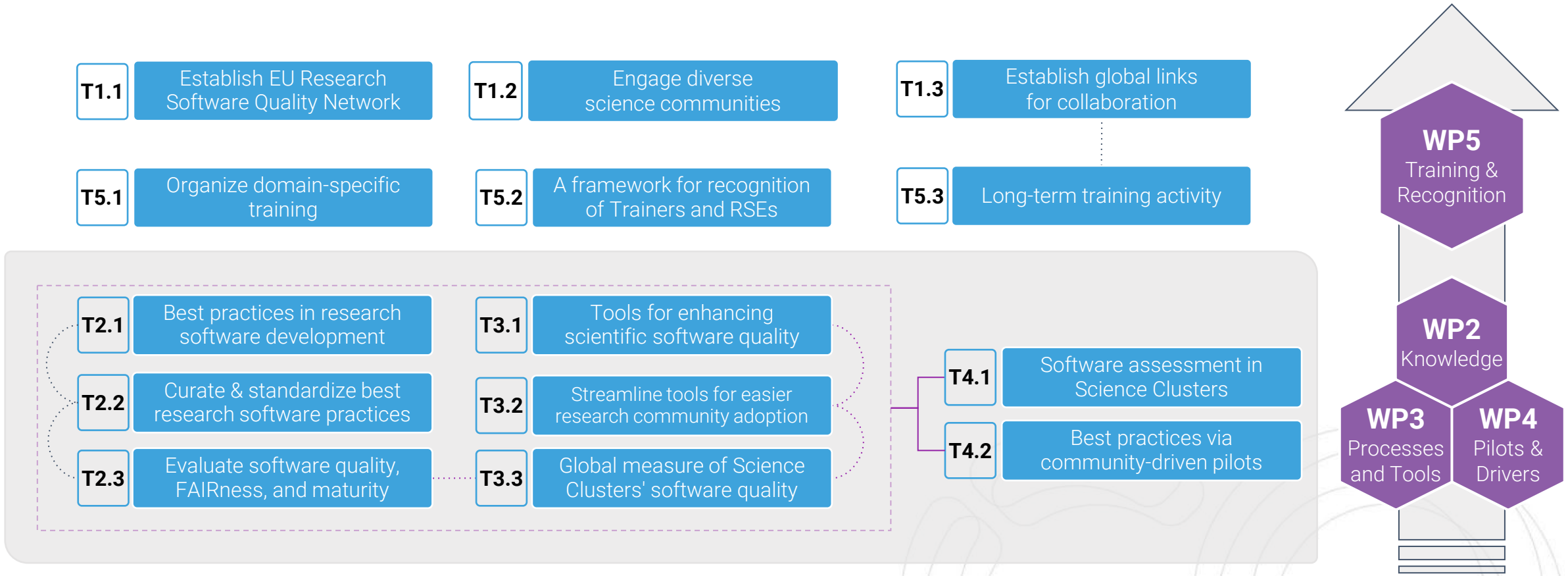
Photon and neutron science: *Integration of Science Cluster PaNOSC through LEAPS/LENS*

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.

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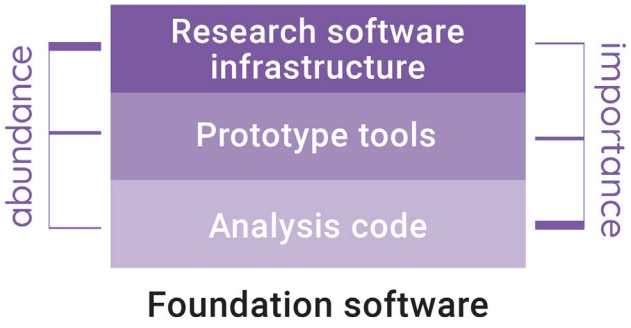
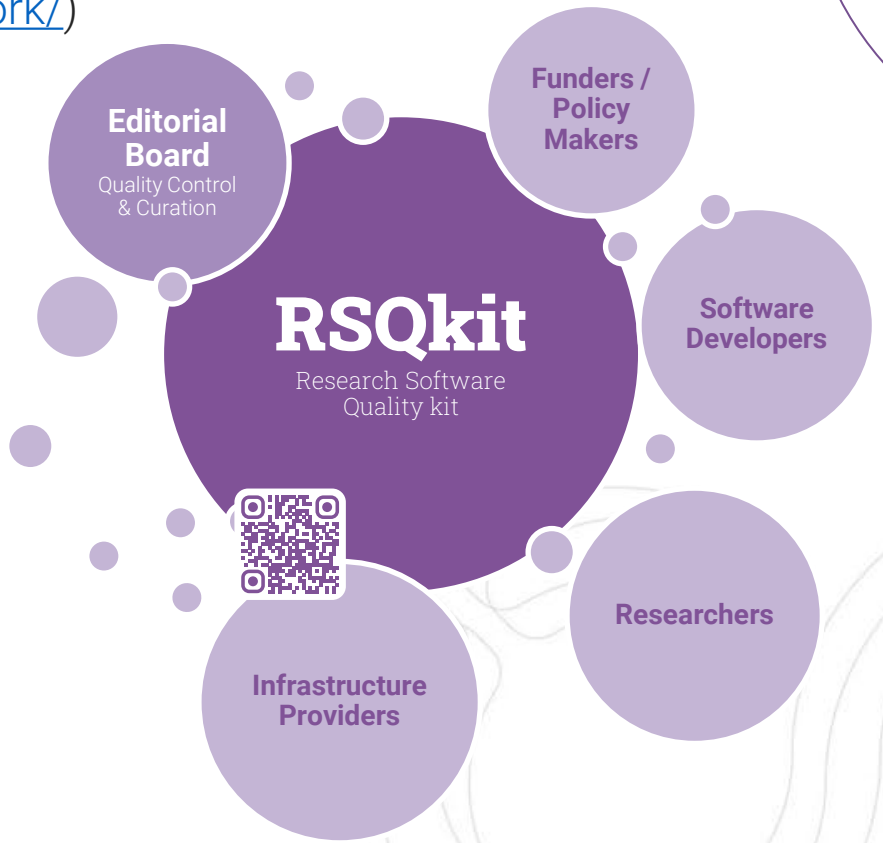
Establishing a Community

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

EVERSE: European Virtual Institute for Research Software Excellence

Connections and Collaborations

Immediate collaborations

OSCARS
Open Science Clusters' Action for Research & Society

Skills 4 eosc

eosc | FAIRCORE4EOSC

SciLifeLab

related projects

eosc | FAIR-IMPACT
Expanding FAIR solutions across EOSC

AI4 | eosc

graspos
open research assessment dataspace

TIER 2

eosc | cancer

Scilake

eosc | RAISE
Research Analysis Identifier System

projects that can benefit from/contribute to EVERSE

ostrails

eosc | SIESTA

eosc | ENTRUST
European Network of Trusted Research Environments

HSF
HEP Software Foundation

elixir STEERS

eosc | EuroScienceGateway

European Genomic Data Infrastructure

SWIFT HEP

Global engagement

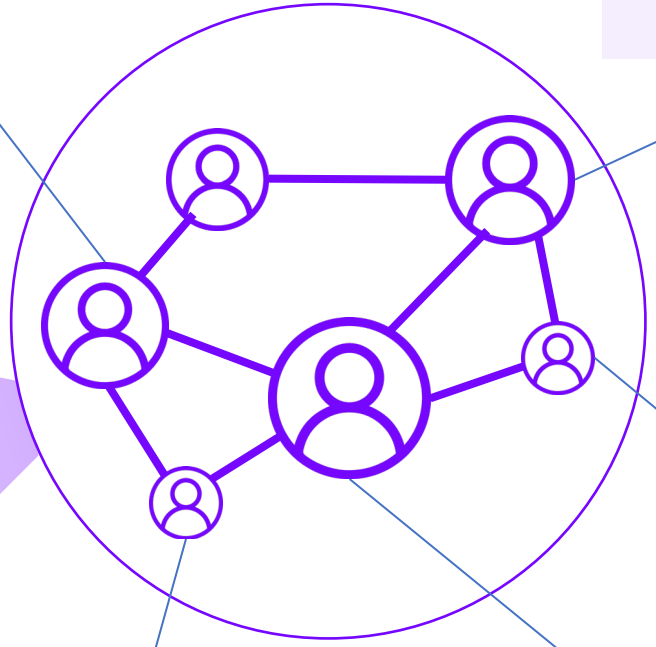
Designing a multinational Research Software event

- 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

Our Ambition

Thematic community nodes

National nodes



Other data infrastructure nodes

Reference EOSC EU Node

European e-infrastructures

EVERSE

panosc photon and neutron open science cloud

LIFE SCIENCE RI

ESCAPE European Science Cluster of Astronomy & Particle physics ESFRI research infrastructures

ENVRI community

SSHOpenCluster Social Sciences & Humanities Resources

EOSC OA 7: Research Software

eosc | OA Expert Group: Research Software

The primary objective of this Expert Group is to address the challenges and opportunities around research software in the context of the EOSC framework.

- specifically target the research software created for research purposes or during the research process
- aims to promote all aspects of research software, including metadata, quality, preservation, registries, reproducibility and recognition
- will closely work with global initiatives and efforts on this domain

RDA RESEARCH DATA ALLIANCE

<ReSA> Research Software Alliance

Thank you!

Contact: contact@everse.software

Website: https://www.everse.software/
BlueSky: https://bsky.app/profile/eosc-everse.bsky.social
LinkedIn: https://www.linkedin.com/company/eosc-everse/
FOSSTodon: https://fosstodon.org/@eosc_everse

Funded by the European Union

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