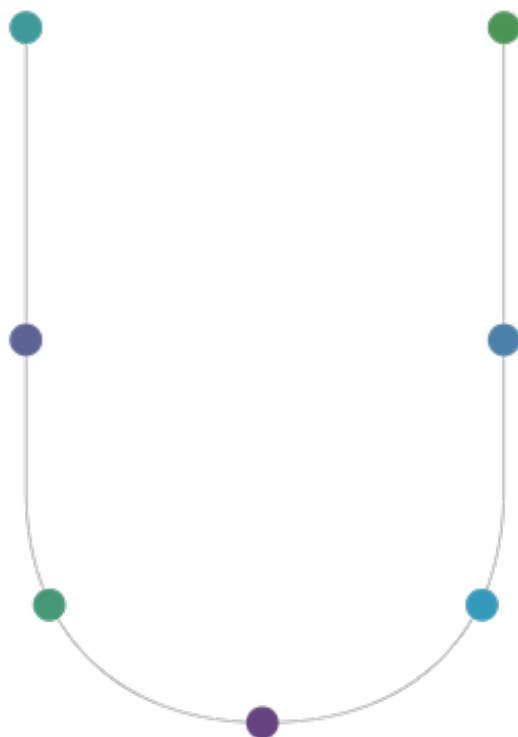


Unite! Open science and innovation strategic roadmap

Deliverable 6.1

Content

Our aim	4
Our commitment.....	4
Our values and impact.....	5
Why open science and innovation?	5
Our choices.....	7
Objective 1. Developing open science policies and open science strategies	8
Objective 2. Enhancing the opening up of digital and physical infrastructures	9
Objective 3. Promoting open science support services.....	10
Objective 4. Fostering open science in careers.....	11
Objective 5. Improving open science competencies	12



Our aim

The ultimate aim of open science should be the informed and extended co-creation of knowledge by all humanity. The goal of this strategic roadmap is to progress towards this aim, by defining a set of objectives and providing recommendations for promoting, developing and implementing university and school level actions, redesigns and incentives for advancing the adoption of open science practices, principles and goals across the universities of the Unite! Alliance. This strategic roadmap describes what actions Unite! Universities should promote to constitute Unite! Alliance as a European engine of open science and innovation by 2023. This strategic roadmap strengthens the development towards the Unite! R&I Agenda.

Our commitment

This strategic roadmap is meant as a guideline for University leaders and regional and national science and innovation policymakers for advancing the opening of science in the Unite! Alliance research systems, for a sustainable economy, society and environment, for a sustainable world. The objectives and recommendations embrace the international framework for policy and practice set up by the [UNESCO Recommendation](#) on how to boost Open Science, approved on 23th November 2021.

Our values and impact

These objectives and recommendations can guide, enhance and foster an open science culture and environment by boosting transparency, accessibility, legitimacy and participation in science among the Unite! research communities of researchers, students, staff, faculty, citizens and partners.

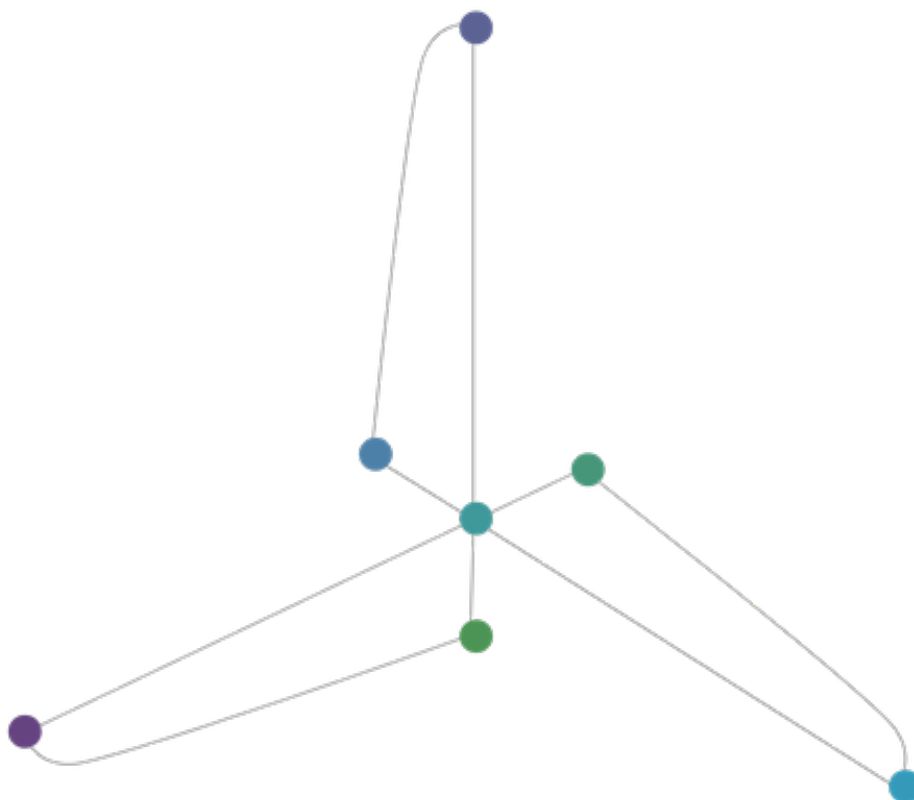
The adoption of open science practices, principles and goals among the Unite! research communities can improve the quality both internal – academic– and external –societal– processes of learning and creation of new knowledge, increasing trust in science, nurturing innovative and entrepreneurial people, and accelerating research and innovation process for finding solutions for the achievement of the Sustainable Development Goals established by the United Nations.

Why open science and innovation?

Open science is transparent and accessible knowledge, shared and developed through collaborative networks. It involves sharing ideas, data, methods and results with local, national, regional and global collaborative networks of research participants. It also goes beyond this to encompass scientific knowledge produced and used by these collaborative networks.

Science is being reshaped by advances in digital technology and tools, including big data, artificial intelligence, the Internet of Things, 3D printing and quantum computing, along with open digital and physical infrastructures, including open labs, open libraries, cultural heritage, digital knowledge bases and open university campuses. These technologies and infrastructures have, in turn, allowed researchers to experiment with, develop and adopt new open science practices, principles and goals for tackling grand societal challenges.

Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal and external innovation. Open science practices for the sharing of knowledge –open data, open access publishing, open protocols, open prototypes– and open science practices for the production of knowledge –transdisciplinary research, participatory design, citizen science, open collaborative tools– have created extraordinary possibilities to this knowledge value creation and transfer process. These practices are expanding not only the “ethos” in science, but also the “ethos” in innovation in universities. Open science practices are transforming science and innovation practices in universities.



Our choices

To support our direction, we suggest five building blocks that best help constitute Unite! Alliance as a European engine of open science and innovation by 2023:

Objective 1. Developing open science policies and open science strategies

Objective 2. Enhancing the opening up of digital and physical infrastructures

Objective 3. Promoting open science support services

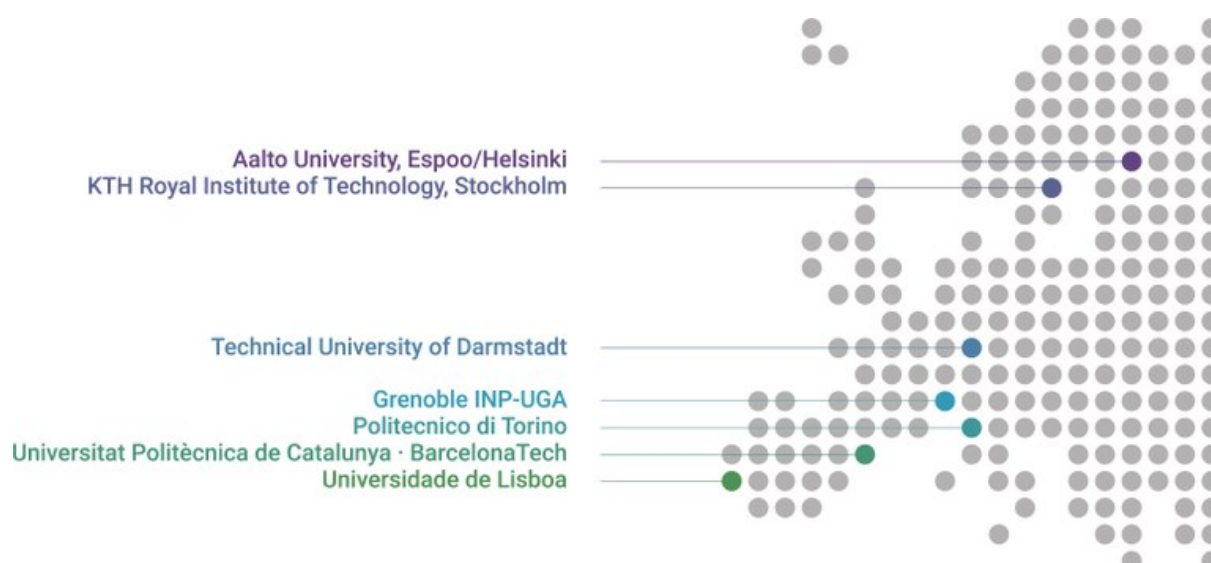
Objective 4. Fostering open science in careers

Objective 5. Improving open science competencies

Objective 1. Developing open science policies and open science strategies

Recommendation 1. Unite! Universities should develop or align their open science policies at university level, building on the UNESCO Recommendation on open science and their regional, national and EU policies, to boost a culture of openness across their research communities. These open science policies should define a common set of principles, standards, goals, career evaluation system, incentives and funding for the operationalization of open science at university level.

Recommendation 2. Unite! Universities should promote open science strategies at school level to implement their open science policies. These open science strategies should provide hands-on guidance on how to adopt open sharing and open collaborative science practices, and how to use open digital and physical infrastructures, taking into account the diversity of each research area.



Objective 2. Enhancing the opening up of digital and physical infrastructures

Recommendation 3. Unite! Universities should invest in university level digital infrastructures for the sharing and production of knowledge among their research communities. This university level digital infrastructure should ensure open as possible –ethical and legal– and permanent open scientific knowledge access – data, code, methods, prototypes, results – for everyone. This infrastructure should allow interoperability, guarantee implementing FAIR data principles, and ensure safety and security.

Recommendation 4. Unite! Universities should open their school level physical infrastructures for research, teaching and innovating, for everyone. They should create guidelines about the infrastructures access policies, training requirements and operation the tools and instruments.



Objective 3. Promoting open science support services

Recommendation 5. Unite! Universities should develop university level open science units for supporting their researcher communities along the different stages of the open scientific process. These units should provide seed funding and training in infrastructure, tools and skills that support and incentivise the adoption of open science practices, principles and goals among their research communities.

Recommendation 6. Unite! Universities should promote open science specialists at school level. These specialists should provide technical assistance, with regard to the specificities of each discipline of knowledge, and promote cross-border multi-stakeholder co-creation of knowledge among their research communities.



Objective 4. Fostering open science in careers

Recommendation 7. Unite! Universities should advocate the review of their regional and national research career evaluation systems to align them with the adoption of open science principles, practices and goals. These new career evaluation systems should give recognition to researchers for the co-creation of knowledge among collaborative networks of research participants.

Recommendation 8. Unite! Universities should adopt school level incentives for rewarding research processes and outputs related to the adoption of open science principles, practices and goals.



Objective 5. Improving open science competencies

Recommendation 9. Unite! Universities should promote multilingual open educational resources on open science for the capacity-building of their research communities. These resources should boost the participation in science among their research communities, composed of researchers, students, staff, faculty, citizens and partners.

Recommendation 10. Unite! Universities should open their training in open science infrastructure, tools and skills for everyone. Programmes, courses, MOOCS, workshops, seminars on-demand on open science should be promoted across their research communities and worldwide as a foundation stone of a European open science and innovation university.



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