

**Transform 4 European Research and  
Innovation (T4ERI)**

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# **REPORT ON BARRIERS AND OBSTACLES TO OPENING UP JOINT ACCESS TO RESEARCH INFRASTRUCTURE AND RESULTING POLICY RECOMMENDATIONS (D2.7)**

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## List of acronyms

EKA -	Estonian Academy of Arts
T4ERI -	Transform 4 European Research and Innovation
T4EU -	Transform4Europe Alliance
UA -	the University of Alicante
UNITS -	the University of Trieste
UNISOFIA -	Sofia University St. Kliment Ohridski
USAAR -	Saarland University
USil -	the University of Silesia in Katowice
VMU -	Vytautas Magnus University
R&I -	Research and Innovation
RI -	Research Infrastructure

## Summary

The Transform for European Research and Innovation project (T4ERI, funded by the European Commission under the SwafS-H2020 call), analysed the legal, administrative and technical barriers and obstacles for sharing research infrastructure (RI) across the European University Alliance Transform4Europe (T4EU).

T4EU partners have jointly developed [CONNECT4RESEARCH](#), an online platform that serves as a tool to facilitate collaboration among researchers and to foster the shared use of RI across the alliance.

The partnering component of the CONNECT4RESEARCH tool was very successful with staggering numbers of visits. However, the part for sharing infrastructure did not perform as expected despite the many visits it received (around 500).

This document explores what are the main barriers and obstacles hindering the sharing of RI within the Transform4Europe alliance.

The present work is the final output of T4ERI Work Package 2: Collaboration in Research and Innovation (WP2) that aimed to:

1. Set up an online research collaboration opportunity map and partnering tool for the T4E[U] partner institutions in all research areas
2. Create a joint agenda for research and innovation in the T4E[U] focus area of digital and environmental transformation for smart, sustainable and inclusive regions
3. Develop innovative and collaborative cross-alliance research centres
4. Enable access to partners' key research infrastructures.

This document corresponds to the Deliverable **D2.7: "Report on barriers and obstacles to opening up joint access to research infrastructure and resulting policy recommendations"** and is the result of the analysis of:

- The potential link to and synergies with existing bodies, protocols and initiatives at European and International level
- The legal and regulatory framework at a national level for all members of the alliance
- The results of the pilot phase of the online tool to facilitate infrastructure-sharing among the Transform4Europe alliance

The relevant results, findings and insights from the above-mentioned components were preliminarily examined in the 'Feasibility study on tool for sharing infrastructures' (D2.5). That document was elaborated in view of providing the members of the consortium with all the necessary information about the actual options for sharing key research infrastructure in the alliance, to facilitate the discussion and the decision-making for selecting the most appropriate solution for infrastructure-sharing within T4EU.

This report summarizes the main barriers and obstacles that the T4EU alliance has identified for opening up joint access to RI and, taking all the above into consideration, the alliance proposes a series of policy recommendations to support decision-making in this key subject for the development of collaborative Research and Innovation (R&I) across Europe.

## 1. Introduction

The European Research Area (ERA) is facing new challenges due to the increasing demands for Research Infrastructure (RI) in various fields, including environment and climate research, humanities, social sciences, and medical research. The ERA is improving the efficiency and effectiveness of the overall European research and innovation ecosystem, and the renewed ERA is expected to exploit the significant contribution of R&I in achieving Europe's wider policy objectives and make the ERA more responsive to society.

The outreach of RIs to other European agendas and policies is decisive, as they are crucial for European research and the sustainable development of the ERA. Investment in RIs is directed by the needs of science and shared policy priorities, while advanced infrastructures create the basis for the development of science itself.

It is proven that unique cutting-edge scientific facilities attract the best researchers from around the world and anchor European science in global research efforts. Thus, structural investment in RIs is required to meet both new scientific needs and contribute to the global challenges we face.

As stated in the “**Report on Good Practices from European University Alliances projects (Pilot II)**”, the aim of sharing research resources (including publications, data, software, and services) and infrastructures (including human resources, instruments, and repositories) is to support researchers in their R&I activities and facilitate collaboration in the European University Alliances.

The alliance adopted the definition of the European Charter for Access to Research Infrastructures for Research Infrastructures, according to which:

*Research Infrastructures are facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields.*

*They include: major scientific equipment (or sets of instruments), knowledge-based resources such as collections, archives and scientific data, e-infrastructures, such as data and computing systems and communication networks and any other tools that are essential to achieve excellence in research and innovation. They may be 'single-sited', 'virtual' and 'distributed'.*

In this spirit, the T4EU consortium has selected the best options for creating an online tool to match researchers to develop joint R&I projects (partnering tool) and an infrastructure-sharing tool available for the entire research community across the alliance. The two platforms were fully developed and merged under the same umbrella: the CONNECT4RESEARCH tool.

## 2. Methodology

The Work Package 2 of the Transform 4 European Research and Innovation (T4ERI) project, led by the University of Alicante, aimed at facilitating collaboration in Research and Innovation across the T4EU alliance, including finding a viable solution for sharing RI among the T4EU partners.

To this end, the consortium established an online research collaboration opportunity map and developed a virtual partnering tool for T4EU partner institutions in all research areas, the so-called CONNECT4RESEARCH.

The analysis of the “Report on Good Practices from European University Alliances projects (Pilot II)” showed that the Transform4Europe alliance had followed a very similar path to some of the most successful European University Alliances in terms of Infrastructure-sharing.

The methodology adopted by T4ERI for sharing RI across the alliance comprised the following steps:

- Mapping of key research resources and infrastructures with the same approach – as the one done by the Aurora alliance–
- Creating digital platforms for knowledge sharing –as it was developed by the NeutechEU consortium–
- Mapping and sharing research resources and infrastructures –as done in ReERUA–

Moreover, the ‘Feasibility study on tool for sharing infrastructures’ (D2.5), a key deliverable from Task 2.4 “Enable joint access to key research infrastructures across the alliance” facilitated the discussion and decision-making process for selecting the most appropriate solution for infrastructure-sharing within Transform4Europe.

Finally, the consortium carried out the analysis of the different legal frameworks at European and national level, the technical viability of further developing the proposed solution, the administrative and managerial procedures as well as the actual awareness on the existing resources.

### **Research Infrastructures in the European Research Area**

The European Research Area (ERA) is improving the efficiency and effectiveness of the overall European research and innovation ecosystem, with a renewed ERA expected to exploit the significant contribution of R&I in achieving Europe's wider policy objectives and making ERA more responsive to society.

Subsequently, the ERA is dealing with an increasing demand for RI in various fields, including environment, climate research, humanities, social sciences, and medical research.

Investment in RI is directed by the needs of science and shared policy priorities, while advanced infrastructures create the basis for the development of science itself.

During the implementation of T4ERI, T4EU members have been working together to harness the joint R&I untapped potential, focusing on digital and environmental transformation for smart, sustainable, and inclusive regions.

For the last 3 years, the T4EU consortium has developed a joint agenda for research and innovation, a joint strategy for attracting and retaining outstanding researchers, and a joint strategy to open science to all members of the T4EU ecosystem.

Moreover, the T4EU partners are well aware of the fact that investing, protecting, and optimizing the use of RI enriches their and Europe's capacity to support innovation, technological advances, and global competitiveness, achieving long-term sustainability of European quality of life and creating solutions to global challenges.

With this objective in mind, T4EU partners, led by the IT Team of the Institutional Project Management Office of the University of Alicante, with inputs from all members in the alliance, developed the online tool CONNECT4RESEARCH. This virtual platform was designed to facilitate collaboration among researchers within the alliance and to foster the shared use of RI across the alliance.

### **3. Barriers and Obstacles**

CONNECT4RESEARCH was customized to the needs of the T4EU alliance and developed after collecting several inputs from the partners, a thorough analysis and in-depth benchmarking of potential solutions and it was tested during a pilot phase by all members.

The tool offers a unique overview of the key research infrastructures available at the 7 different universities that comprised T4EU ab initio. CONNECT4RESEARCH is proven to be user-friendly. However, despite the many visits it has received, less than 1% resulted in an actual request to access/use the research infrastructure consulted.

Among the many factors analysed to try to identify the main barriers and obstacles that hinder the actual sharing of research infrastructure, the consortium realised that there were so many levels and components affecting the shared use of RI that it was not easy, even at individual level, to understand what the applicable dynamics and frameworks were.

#### **Different frameworks, strategies, agreements at European Level**

An analysis showed that all T4EU members were members of some of the main frameworks and bodies related to European Research Infrastructures:

- The European Charter for Access to Research Infrastructures sets non-regulatory principles for defining Access policies for Research Infrastructures and related services.
- The European Strategy Forum on Research Infrastructures (ESFRI) supports a strategy-led approach to RI in Europe, emphasizing their importance in the knowledge triangle.
- The European Research Infrastructure Consortium (ERIC) is working to develop an integrated ecosystem of research infrastructures in Europe.
- The Association of European-Level Research Infrastructures Facilities (ERF-AISBL) promotes cooperation between European-level research infrastructures and external researchers.
- The European Strategy Forum on Research Infrastructures (ESFRI) has released a report on the implementation of European Research Infrastructures (ERIs), identifying key opportunities for social and economic benefits, challenges, and potential solutions for effective financing and operation.
- Horizon Europe's Work Programme 2023-2024 focuses on research infrastructures, including the European Open Science Cloud (EOSC) and technology infrastructures (Tis).

- The European Open Science Cloud (EOSC) is a federated, open environment for European researchers, innovators, companies, and citizens to publish, find, and re-use data, tools, and services for research, innovation, and education.
- The Global Research Infrastructures (GRIs) International Cooperation Forum (GSO) has developed a framework to help RIs determine their global status.

### Different Roadmaps and Legal frameworks at National Level

Moreover, each member of the alliance was subject to its own national regulation with its own strategies and roadmaps concerning the regulation, use and funding RI.

- In Bulgaria, the National Roadmap for Research Infrastructure 2020 – 2027 (NRRI) includes the main research complexes in the country and their respective prioritization at European and national levels. The updated NRRI contains 51 projects, including 23 new projects and 15 Centers of Excellence and Centers of Competence.
- Estonia's Research Infrastructure Roadmap serves as a long-term strategic planning tool for large research infrastructures of national importance. The roadmap is a multi-ranking list of research infrastructures that have great impact in Estonia and serves as important input for future strategic decision-making, including funding decisions. The commission submitted proposals for implemented research infrastructures that have completed or are soon to complete the establishment phase, but their thematic differentiation from newly established infrastructures is justified to avoid accumulative expansion.
- The National Roadmap Process in Germany is a strategic instrument for prioritizing federal investments in extensive research infrastructures. This tool is crucial for research, teaching, promoting young talent, and transfer.
- In Italy, the National Program for Research Infrastructure recognizes the European Science Foundation's definition of Research Infrastructures (RI) as facilities, resources, and related services used by the scientific community to conduct high-quality research. RIs meeting this definition can take the legal form of a European Research Infrastructure Consortium (ERIC) and may be in a favourable position to access European Structural and Investment Funds (ESIF) funding and European Investment Bank (EIB) loans.
- In Lithuania, the development of the Roadmap for Research Infrastructures aims to overview the current situation of RIs in the country, evaluate prospective national projects, and present proposals for incorporating national RIs into respective pan-European consortia. The inclusion of a research infrastructure in the roadmap does not guarantee its funding but serves as a guideline/aid to the decision-making process.
- In Poland, the Polish Roadmap for Research Infrastructures comprises 70 ambitious research infrastructure projects of great socio-economic significance. The roadmap serves as the basis for the investment policy of the Ministry of Science and Higher Education in the coming years, but placing a project on the roadmap does not automatically imply the financial commitment of the Ministry.
- Spain is receiving assistance to finance its participation in the European Research Infrastructure Consortium (ERIC), aimed at coordinating and improving Spanish nodes to meet pan-European infrastructure requirements. The Subprogram for State Infrastructure and Scientific-Technical Equipment aims to develop, maintain, and invest in scientific and technological infrastructures that contribute to a competitive international R&I ecosystem.



## **Diversity of internal regulations at Institutional level**

The many different European and national roadmaps and legal and regulatory frameworks for research infrastructures were translated into different forms in each member of the alliance, which added an extra level of complexity in trying to reach a solution to offer shared RI across the T4EU partners.

## **Regulation of Use and Management of Access Request Conditions**

One of the main obstacles to facilitate sharing RI came from the fact that the mapping of the key RI within T4EU members served to collect information about circa 500 items (considering devices, databases, facilities, libraries, etc). Each item had different access conditions (in terms of potential use, availability in time, cost of the service –if applicable–, etc) and the RI were located all over the campuses of the T4EU alliance which expand now to ten different countries plus one associated member, the Mariupol State University, in Ukraine.

Furthermore, the geographic coverage across Europe implies that a shared use of infrastructure must come with both, physical mobility and online connection among researchers.

Making it impossible to always have the updated information about each RI access conditions, it was decided that the requests would be analysed and responded on a case-by-case basis.

Taking all the above into consideration, T4EU partners (throughout their T4ERI project) jointly developed an online platform for infrastructure-sharing across the alliance: the CONNECT4RESEARCH (partnering and infrastructure-sharing) tool.

The infrastructure-sharing component was first identified as another potential success, given that the partnering tool was being used by more than 420 researchers from all T4EU universities. However, almost no requests for access to research infrastructures were received during the pilot phase.

The partners then discussed the possibility of further developing the tool in the framework of the new Erasmus+ initiative, T4EU. The technical development and maintenance, however, need more resources and time.

## **Technical viability in relation to time and resources**

The T4ERI UA Team, in particular the IT Department of the Institutional Project Management Office (OGPI), analysed the technical viability of implementing best practices regarding shared research infrastructures conditions from other alliances funded under the same calls (SwafS-H2020). The benchmarking showed the CONNECT4RESEARCH was one of the most advanced tools among all European University Alliances (and the only one including so many features entirely developed by project partners only).

The development of the infrastructure-sharing tool included the definition of different stages in the process, including purpose, planning, design, technical development, communication, evaluation, key performance indicators, improvements and final changes, delivery, and maintenance plans. The infrastructure-sharing tool was developed according to this concept proposed by IT experts and approved by the partners and was fine-tuned with inputs from the project partners received during the pilot phase.

A benchmarking analysis was conducted to identify and compare how other alliances funded under the same calls had approached sharing infrastructure among their members. The results showed that the concept and working version of the tool for sharing infrastructures—for the pilot phase and its combination with the partnering tool were very similar to the best solutions identified in the other three alliances.

The 'Inventory of key research infrastructure' (D2.3) showed that there were nearly 500 key research infrastructures that could be potentially used by all researchers from the Transform4Europe partner universities considering only those RI from the initial 7 members of the alliance.

The T4ERI consortium then opted for listing all potentially shared RI in the CONNECT4RESEARCH tool and studying each individual request for access on a case-by-case basis.

Given the complexity of the technical development and the amount of time needed for the implementation, the infrastructure-sharing tool was developed at a very early stage in the project life and taking into consideration the results of the benchmarking analysis and according to the concept proposed.

The tool counts on nearly 500 RI items that can be potentially shared by all partners. However, the conditions vary largely depending on the particular item (device, equipment, library, etc). So far, the request for access is collected by the UA Team and processed by the corresponding university.

However, the number of visits to the infrastructure-sharing component of the tool was very high (above 500), but nearly no requests for access were received. This was seen as a clear need for further development of the CONNECT4RESEARCH tool to make it more appealing to the potential researchers in need of RI that could be found across the alliance.

After the successful integration of the infrastructure-sharing tool into the T4ERI partnering tool, the partners started discussing the feasibility of the inclusion of new features concerning the specific regulations for shared access for each RI.

More specifically, the T4ERI partners decided upon the possibility of adding two sections that had been considered as relevant for further development of the tool and that they were proven to be key in the benchmarking analysis: i) Specific sharing terms and conditions for each item (research infrastructure device, equipment, library...) ii) Legal framework for each item.

However, the addition of the new features would have an impact on the workload of the T4ERI partners since, unlike for instance the RIS4CIVIS alliance, the infrastructure-sharing platform did not exist before and was not developed by an external company but by the project partners themselves, in the case of T4ERI, by the University of Alicante with several contributions from all consortium members. The immediate consequences of the addition would be:

- The specific sharing terms and conditions for each item should be provided by all partners with the subsequent need of efforts dedicated beyond the project lifetime of T4ERI in which it was developed.
- The legal framework for each item would have to be provided by all partners.

- All input from partners should be collected as part of the T4EU initiative, as the tool will be extended to include data from the new members of the alliance.

Meanwhile, the IT team already advanced the development regarding:

- Adaptation of tool layout to incorporate Transform4Europe visual identity.
- Improvement and update of the content of sections of common interest
- Integration of infrastructure-sharing tool and partnering tool under the same site.

### **Insufficient communication**

Finally, it was agreed that a very clear obstacle to the use of the RI was the fact that many researchers in T4EU had very little knowledge about the CONNECT4RESEARCH tool and no clear understanding of the opportunities that it offers which results in insufficient interest and underuse of the tool in regards of sharing infrastructures.

## **4. Conclusion**

The analysis of the possibilities to open access to research infrastructures within the alliance showed the best option for the consortium: an online platform that could be integrated in the partnering tool (already developed by T4ERI) and that included the full inventory of RI in the alliance that could be shared. This tool should give the users (researchers) the opportunity to search for the RI that they needed filtering by category, area of application, location, etc in a very user-friendly manner to maximize the use of the tool.

The T4ERI approach was finally selected after a careful review of relevant European and international initiatives to explore potential synergies and after collecting the legal and regulatory frameworks for RI at national and European level for all members of the consortium, and it also included the best practice extracted from the benchmarking analysis of the solutions provided by other European University Alliances.

The consortium has been able to complete the development of the infrastructure-sharing tool according to the concept (Purpose, Planning, Design and Technical development) and the IT OGPI Team has also successfully integrated the infrastructure-sharing tool into the T4ERI partnering tool. The infrastructure-sharing tool is fully functional (see Appendix 6) and available via this [link](#). However, the above referred obstacles need to be overcome to make the tool truly useful in the future: sharing key research infrastructures that can be used by T4EU researchers.

## **5. Policy recommendations**

Considering the relevance of research infrastructure, the T4ERI partners (now T4EU partners under the new EU funded initiative) are fully aware that investing, protecting, optimizing the use of RI and even its shared use, enriches their and therefore Europe's capacity to support Research and Innovation, technological advances, and global competitiveness, achieving long-term sustainability of European quality of life and creating solutions to global challenges.

Thus, the consortium proposes a series of recommendations for policymakers based on the experience of the T4EU alliance for sharing RI.

## **Awareness rising**

Substantial efforts are devoted to the development of tailor-made solutions for each European University Alliance, however, despite the efforts made during the project, the tools and resources available are not sufficiently known by the researchers. The alliances should focus their efforts on strong Communication campaigns that bring these customized solutions to the knowledge of the wider researchers' community across the alliance.

It is advised that communication campaigns are launched back-to-back to the announcement of funding calls (e.g. T4EU Seed-funding programme) since this has had a very positive turn over in terms of registration of new users to the CONNECT4RESEARCH tool.

## **Increase visibility**

The CONNECT4RESEARCH tool can be found under the RESEARCH & INNOVATION section of the T4EU website and, therefore, not so visible to external visitors. The partners are working on improving the internal and external visibility of the tool to make it easier to access.

Among the most successful events are the live demonstrations, info-days and joint events where funding opportunities are also presented to members of the alliance and the benefits of using the tools are clear, immediate and tangible to the researchers.

## **Promotion of the tool at National and European level**

A wider distribution by the National Agencies and Commission services of all available tools in the alliances could facilitate the interest in these solutions and boost its use at a much wider scale.

This promotion would help reaching the maximum number of researchers multiplying the potential number of users that benefit from the tools boosting joint Research & Innovation and that take advantage of the opportunity to use key RI from other universities in the alliance that otherwise might not be available for them.

## **Resources**

The alliances can continue adding more features to the platforms or even maximizing the regional impact by opening the tools to key R&I stakeholders allowing for registration of their researchers' communities to find more R&I synergies and also to have access to their RI.

Securing further resources beyond the project's lifetime to continue with the expansion, maintenance and update of the infrastructure-sharing solutions is key to capitalize on the efforts made and to benefit on these custom solutions developed with European funds.

In the case of T4EU, it was agreed that the possibilities of the CONNECT4RESEARCH tool to facilitate sharing key RI are immense. Thus, the partners included as part of the new funding strategy, the search for adequate funds to continue developing the tool and expanding it to include all RI from the new members of the alliance to tap its full potential.



## 6. Appendix

### FINAL VERSION OF THE INFRASTRUCTURE-SHARING TOOL SECTION – Simple Search

MENU

## INFRASTRUCTURE

Home

The T4ERI Infrastructure-sharing tool is a joint online agile tool for identifying research infrastructure available within the Transform4Europe Alliance. It allows researchers to know what databases, devices, equipment, infrastructure and libraries could be used for research activities. Enter here to request information about each item and the specific conditions to access.

Enter the terms you wish to search for...

SPECTROMETER

Category
Institution
Potential Discipline / Fields of Application

- Any -
- Any -
- Any -

Apply
Reset

Displaying 1 – 10 of 35

Delta mass spectrometer with processor

ID: 1101

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- **Category:** Equipment / Device
- **Model:** Epson printer, varian 3400 gaschromatograph
- **Institution:** University of Trieste
- **Potential discipline / fields of application:** Life Sciences    Medical Sciences    Physics

[REQUEST ACCESS](#)

**MENU**

## INFRASTRUCTURE REQUEST

View Results

<p><b>Infrastructure info</b></p> <p>ID * <input type="text" value="1101"/></p> <p>Infrastructure * <input type="text" value="Delta mass spectrometer with proces"/></p> <p>Model * <input type="text" value="Epson printer, varian 3400 gaschroma"/></p> <p>Institution * <input type="text" value="University of Trieste"/></p>	<p><b>Date info</b></p> <p><b>When would you need access?</b> Please indicate the approximate date when you would need access -should you know it-.</p> <p>From <input type="text" value="dd/mm/yyyy"/></p> <p>To: <input type="text" value="dd/mm/yyyy"/></p>
<p><b>Contact info</b></p> <p>Comments <input type="text"/></p>	

MESSAGE OF THE SYSTEM – after Research Infrastructure Access Request

