This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

WORK PACKAGE 2

Preliminary Roadmap

Period 2: Month 6 - Month 12

11th January 2022

Grant Agreement number: 101016691

Acronym: RIS4CIVIS

Project title: Research and Innovation Strategy for the CIVIS Alliance

Period covered by the report: from June 2021 to December 2021

Report: *[2.2]*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Document Approver(s) and Reviewer(s):
NOTE: All Approvers are required. Records of each approver must be maintained.

Name	Action	Date
RIS4CIVIS coordination team (AMU)	*Review*	13/12/2021
WP2 leader	*Review + integration of module comments*	11/01/2022
RIS4CIVIS coordination team (AMU)	*Approve*	11/01/2022
Monitoring Committee	*Approve*	21/01/2022

Dissemination level: Public

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Table of contents

List of Tables and Figures 4
Executive Summary 5
1. Introduction 6
2. Overall overview per Module: Desired End-points & Preliminary Roadmaps 9
Module 1: Common Research and Innovation Strategy 9
Module 2. Sharing Infrastructures 16
Module 3: Reinforcing Academia-Business R&I Cooperation 21
Module 4: Strengthening Human Capital 32
Module 5: Mainstreaming of Open Science 48
Module 6 – Embedding Citizens and Society 56
3. Obstacles and barriers 64
Module 1 64
Module 2 64
Module 3 65
Module 4 66
Module 5 66
Module 6 67
4. Recommendations and Conclusions 68

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

List of Tables and Figures

Figure 1. RIS4CIVIS Organizational Structure..... 6

Table 1. Module 1: Desired end-points & Preliminary Roadmap..... 13

Table 2. Module 2: Desired end-points & Preliminary Roadmap..... 20

Table 3. Module 3: Desired end-points & Preliminary Roadmap..... 29

Table 4. Module 4: Desired end-points & Preliminary Roadmap..... 43

Table 5. Module 5: Desired end-points & Preliminary Roadmap..... 52

Table 6. Module 6: Desired end-points & Preliminary Roadmap..... 60

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Executive Summary

The present report aims to provide an overview of the work carried out by the 6 Modules which compose RIS4CIVIS from the 6th to 12th months of the project during the Work Package 2 period. The purpose of WP2 – Consensus-building, is to reflect and identify the desired end-points for each Module (task 2.1) and then develop roadmaps determining the path to follow between the current status of CIVIS R&I Cooperation, and the desired end-points (task 2.2), developing recommendations to national and European policy-makers for the removal of legal or regulatory barriers (task 2.3).

In sum, based on the results from the Benchmarking phase (WP1) objectives of the Consensus-building phase (WP2) are:

- To identify the desired, long-term end-point for each Module;
- To analyse the barriers to the achievement of the long-term goal;
- To identify roadmaps to overcome the barriers and reach the end-points; in the short-, medium- and longer-term;
- Where the removal of barriers is not in the power of the CIVIS Alliance members, to formulate Recommendations concerning their removal, addressed to national and European policy-makers;
- To determine a case study that can be implemented within the project time frame to test the validity of the roadmap.

This Deliverable presents the preliminary results from the first and second tasks of WP2, consisting of, respectively, identifying the long-term end-points and elaborating the roadmap to achieve them. In this report, the conclusions drawn, and the proposals developed originate from each Module and constitute the basis for further consideration. The preliminary roadmaps presented in this deliverable together with the results of the following Deliverable 2.1 will be used as a baseline to WP3 development when the roadmaps will be validated through case studies implementation.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

1. Introduction

"RIS4CIVIS" is a 3-year project funded by the European Commission under the Horizon 2020 "SWAFS" programme. RIS4CIVIS aims to support the Research and Innovation dimension of the CIVIS European University in line with its shared, integrated, long-term strategy and synergy with its education dimension. The project aims to enable the CIVIS Alliance and other European Universities to pave the way and pool out their expertise to address the 21st-century challenges through world-class R&I.

RIS4CIVIS will develop an integrated, long-term R&I Strategy, based on the member Universities' complementary strengths, but also addressing obstacles that stand in the way of deeper R&I cooperation. RIS4CIVIS, therefore, focuses on developing a long-term Research and Innovation Strategy that will:

- Take into consideration the important roles that academia, industry, government, civil society, and the environment play in R&I (Quintuple Helix model);
- Be fully in line with the CIVIS Mission Statement, including our civic mission and educational dimension;
- Build on the cooperation and results that have so far been achieved within our Alliance.
- Address current societal challenges;
- Integrate the upcoming European Research Area cycle synergistically with the new cycle for the European Higher Education Area.

To meet its objectives, the project is structured in **six 'Transformational Modules'** such as:

(1) The development of a Common Research and Innovation Strategy;
(2) Sharing Infrastructures;
(3) Reinforcing Academia-Business R&I Cooperation;
(4) Strengthening Human Capital;
(5) Mainstreaming of Open Science;
(6) Embedding Citizens and Society.

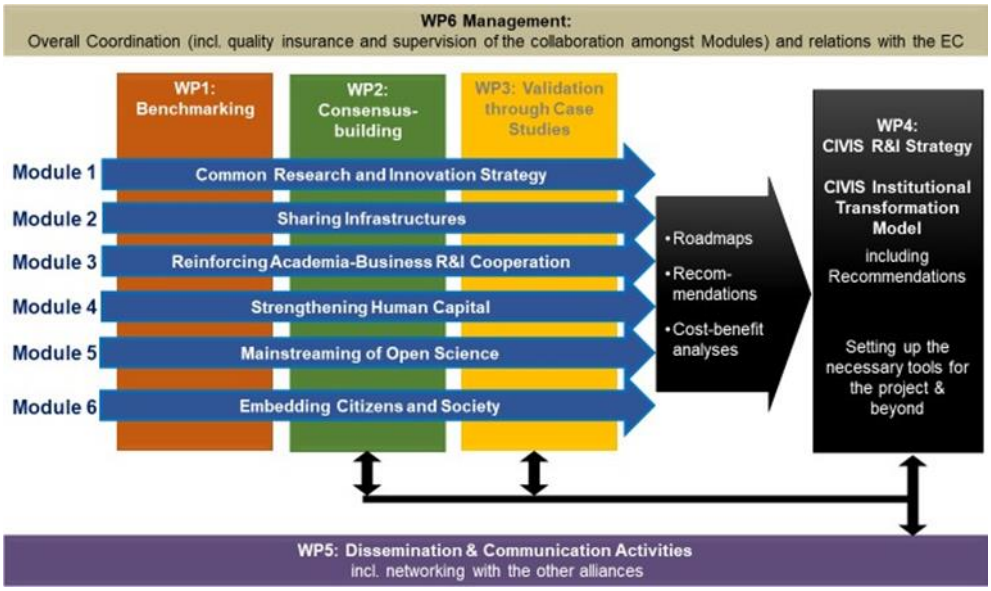

Figure 2. RIS4CIVIS Organizational Structure

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

In the first phase of the RIS4CIVIS, the WP1 has developed an atlas and an inventory or overview of:

- Current practices within each CIVIS Alliance member in regard to the topic covered in each Module (can be seen in Figure 1.);
- National situations (legal, regulatory, political, financial, procedural, systemic) that affect each university-partner again in regard to the topic covered in each Module (can be seen in Figure 1). This activity included the identification of legal and governance barriers as well as external funding sources,

establishing a share basis for the work carried out during the current Consensus-building Phase (WP2).

Therefore, based on the results from the Benchmarking phase , the objective of the Consensus-building phase is:

- To identify the desired, long-term end-point for each Module;
- To analyse the barriers to the achievement of the long-term goal;
- To identify roadmaps to overcome the barriers and reach the end-point; in the short-, medium- and longer-term;
- Where the removal of barriers is not in the power of the CIVIS Alliance members, to formulate Recommendations concerning their removal, addressed to national and European policy-makers;
- To determine a case study that can be implemented within the project time frame to test the validity of the roadmap.

To start with, each Module Leader has led its committee (for recall, every Module committee gathers at least one representative/expert from each of the CIVIS Universities) through a reflection on the desired or ideal end-points of cooperation between the CIVIS Alliance members: what situation would need to exist for the Alliance to produce the best possible Research & Innovation?

Therefore, the Module committees are developing their roadmaps, determining the path to follow between the current status of CIVIS R&I Cooperation, and the desired end-points. Roadmaps refer to the Benchmarking including the information on barriers and obstacles. The roadmaps include, as relevant:

- Short-term 'minimal' actions/standards/procedures to be immediately implemented throughout the Alliance;
- Identification of obstacles that can be overcome in the medium-term, how they can be overcome, and what our R&I Cooperation should look like in the medium-term;
- Identification of long-term obstacles that need to be addressed in order for each Module to reach its desired end-points, and how these should be addressed.

During the current Consensus-building phase the work is being carried out by internal Modules meetings, as well as monthly meetings with the WP2 coordination group and the six Modules Leaders. Moreover, cross-Modules meetings have been organized in order to identify transversal aims and implement common actions.

The meetings between the WP2 coordination team and Module Leaders are used as an essential channel of communication which completes the use of emails. In the first meetings, the WP2 coordination group presented the aims of WP2, the tasks and their timing, the reports to be prepared by the Modules Leaders, as well as the list of deliverables and their respective deadlines. Since the beginning, the WP2 coordination team has also emphasised the importance of cooperation across the

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Modules in order not to duplicate work, identify transversal aims and implement common actions. Therefore, currently, the meetings between WP2 and Modules Leaders are being used as "workspace", focused on identifying and defining cross-Module actions.

So far in the Consensus-Building phase, the six Modules have defined the desired end-points and their respective preliminary roadmaps. Each of them is presented in the next section of this deliverable.

In the next section, the presentation of the work carried out by each Module are organized in (1) Module objectives, (2) methodology and procedures applied to define the desired end-points and associated roadmaps, (3) desired end-points and roadmaps presentations.

Each roadmap is composed by:

- The desired end-points presentation;
- Why to active them;
- Timing;
- People involved;
- Indicators;
- Potential barriers/risks at short, mid-, and long-term.

This deliverable finalizes presenting the obstacles and barriers, followed by recommendations and final remarks.

Concerning the next steps of the RIS4CIVIS project, and as part of the final period of the Consensus-building phase, the six Modules will (1) refine the final version of their roadmaps, (2) develop draft Recommendations for removing legal or regulatory barriers to cooperation, addressed to National and/or European policy makers; and finally, (3) each identify a case study to be implemented during WP3 period.

These will be presented mid January to the RIS4CIVIS Monitoring Committee as ultimate decision body.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

2. Overall overview per Module: Desired End-points & Preliminary Roadmaps

Module 1: Common Research and Innovation Strategy

This Module will develop a long-term Strategy for CIVIS Research and Innovation cooperation. According to the Grant Agreement Annex 1, this Strategy will integrate the work of the five CIVIS Hubs, but will also have the vision and flexibility to include and integrate new societal challenges and research areas as these emerge.

The objectives of this Module are:

- To develop **a methodology for the definition of CIVIS R&I agendas** and strategies that enables CIVIS to anticipate and respond quickly and flexibly to emerging societal problems and new opportunities.
- Using this methodology, to develop a **CIVIS Strategy** that will guide its **long-term cooperation in terms of R&I**, and will also enable it to participate in European-level policy-making on R&I (for instance, for Horizon Europe: co-creation of future strategic programmes or work programmes).
- To **document the methodology** so that it can be used within CIVIS, by (and with) other European Universities or consortia of universities to develop their own high-quality, reactive R&I strategies and agendas.

Methodology & Procedure applied to data collection

Due to challenges in finding out what was expected by the model for WP2 and different holiday periods in different countries in combination with heavy work overload in September, a first meeting in the MModule 1 was called for as of October 8 2021. In the call to this meeting all university partners were asked to gather information about what desired end-points their respective universities have about their strategies for research and innovation. They were also asked to, at the same time, try to gather information about barriers to achieve these end-points and road maps to overcome the barriers. Although we plan to come back to discussions of the barriers and roadmaps, it was decided that these are so tightly connected in practice that it is hard to separate them when it comes to gathering information.

In a way, this is very general information, but also information that is of top strategic importance for the universities. To gather such information, therefore, requires dialogue with top university managers. How all partners have managed to gather their data may differ depending on how their respective universities are organized and where in the organization this information is available. Therefore the members of the MModule 1 were asked three simple questions:

-What are the desired end points for research and innovation at your university?
-What barriers to achieving these end points do you experience?
-Do you see any roadmaps to overcome these barriers?

In gathering this information we have not seen any use of collaborating with other Modules, and since the results from WP1 in the Module was that the relation to the CIVIS Hubs in the central research and innovation strategies at most partners were not emphasized, having a particular focus on what end-points for research and innovation the universities have in relation to the hubs at this next step did not seem to be the best way to cover what end points the partner universities have for research and

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

innovation. Still, we asked the members of the Module to take the Hubs into consideration in gathering their data.

We have also sent out the protocol from the meeting for comments and adding of information or clarifications. A very first draft of this report was discussed during the meeting and this draft of the report has also been sent around among the Module members for comments.

Results: Module 1 - Desired End-points & Preliminary Roadmap

Stockholm University (SU) wants to encourage the emergence of bottom-up research of high quality within the collaboration and therefore collaboration is desired in areas in which excellence can be achieved. Collaborations should not be identified and initiated top-down. In order to achieve this a well-functioning communication around research profiles is needed to make sure that it is easy to identify and contact researchers at partner universities. Furthermore, it is crucial that resources are available for collaborations.

Université libre de Bruxelles (ULB) also stresses that research collaborations should be initiated bottom-up and that academic freedom is very important. Initiated collaborations could be related to existing Hubs but also in other areas. In order to enable collaborations, it is important to establish funding schemes enabling this. It is also crucial that it is easy to identify contacts and units at all universities. A common communication strategy could also be important to encourage research collaborations.

Aix-Marseille Université's (AMU) desired end points are similar to those of SU and ULB, e.g. to enable bottom-up initiated research collaborations. In order to initiate cross-university collaboration, AMU also brings attention to the need to have a map of R&I clusters of excellence at all partner universities, perhaps available through a searchable database in order to support the emergence of research collaborations and networks. Furthermore, AMU emphasizes a need to prioritize collaborations and to link efforts with other Modules and the CIVIS Hubs. One suggestion is to prioritize the design of a joint CIVIS agenda based on areas of excellence at each university, that could for instance sbe based on the structuration of each university research areas (for AMU, the so called interdisciplinary institutes) or to use common reference such as the ERC panels.

Universidad Autónoma de Madrid (UAM) also brings attention to ideas similar to what has already been stated by SU, ULB and AMU in particular and also states that it would be useful to have a common catalogue describing ongoing research and research services within the CIVIS network.

A similar approach is also shared by the University of Tübingen (UT). UT also emphasizes end-points such as bottom-up emerging excellent research based on academic freedom, the establishment of excellent research teams around emerging topics, and collaboration around the Hubs or other themes. Moreover, as several others, they also emphasize a need to strengthen network activities and create opportunities for exchange in order to identify areas of common interest as potential complementary starting points for research collaboration. Thus, research collaboration should not necessarily be limited to the CIVIS Hubs. Of much help could be to develop screens for appropriate calls for research funding.

Sapienza (SUR)'s suggestion is, contradictory to the desired end-points of SU, ULB and AMU, to start from the Hubs and identify and prioritize collaboration around 2-3 topics per hub. This means that they see benefits in top-down strategies for research collaboration. They also emphasize the importance to establish links between research, education and the surrounding society and that the strategies for RIS4CIVIS should be linked to the partners' approaches to EU policy-making. Although emphasizing the

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

importance of initiating research with the CIVIS Hubs in mind Sapienza also stresses the importance of that research must be built bottom-up and that both financial and human resources are crucial for the collaborations to be successful. They see exploiting available funding opportunities such as the Green deal, Horizon Europe, etc. as crucial for establishing collaboration.

The University of Athens (NKUA), like most others, highlights the importance of lists or catalogues of people with different responsibilities, roles and research interests and profiles. NKUA also states that it would be valuable to have a central monitoring committee with the possibility to follow up on joint activities, and they also emphasize that a common approach is needed if initiated collaborations are to be successful.

There is not much available information about desired end-points for the time being from the University of Bucharest (UB), however, they have expressed a need for sharing information about researchers, profile areas in research and roles of people.

The desired end-points selected

Following from above it is clear that the desired end-points that dominate among the partner universities are:

1. Establish research collaboration based on emerging bottom-up excellent research generated in academic freedom;
2. Establish systematic information about research profiles, researchers and research support unites at the partner universities in order to ease for researchers with similar interests to get in touch, and also for research support staff to establish a contact in order to develop joint projects and programs with the potential to support research collaboration across universities.

Why do you want to achieve those end-points

- A central argument for why this is desirable is that areas for excellent research cannot be decided from outside academia;
- Moreover, achieving excellence in research and also establishing sustainable and creative research collaboration take time and have to be based on research interests and trust between researchers in combination with the necessary funding;
- Research excellence is not automatically achieved by setting up collaborations between universities. Collaborations must add something otherwise it may be contra-productive and cause important results to be missed.

Actions implemented to achieve those goals

- Contact lists and communication about research profiles at the respective universities are essential for facilitating emerging collaboration between researchers. Collaboration with the CIVIS IT team is essential on that matter
- Support initiatives for emerging research collaboration;
- Funding for bottom-up collaboration initiatives;
- Staffan: shouldn't we add definition of common set of criteria (eg disciplinary, sicnetific fields etc.) as a guideline to draw research profile – cf. discussion about ERC of similar).

Possible indicators to measure the effectiveness of the actions put into practice

- Establish systems for following up attempts for research collaboration taken, such as registering jointly authored publications between scholars from different universities;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

- Follow up if research collaborations are established in funded projects etc.

Timing

- Establish sustainable research collaboration takes time and could be followed up in three-year circles.

Potential barriers/risks which could impede reaching the end-points.

1. HR and financial resources: Researchers may be occupied with teaching and other on-going research that make it difficult to engage in new research with researchers they do not know. Often research develops between researchers that know each other and after having found people they like to collaborate with their will to change to new partners might not be so strong. Finanicial resources are also crucial. It will be difficult to build new research teams without funding;
2. Academic freedom: Collaboration, especially around topics decided by central units or politicians, may interfere with the principle of academic freedom. This possible barrier is related to what role research is expected to have in society and if research topics are decided outside of academia or by university boards. Consequently, academic freedom can be a barrier to collaboration;
3. The view of how research excellence is achieved (top-down or bottom-up): The dominant view of how research excellence best is achieved among the partner universities is a bottom-up perspective. This can be a barrier to desired research focus on, for example the CIVIS Hubs if this is not the kind of research the partner universities have their excellence in. The desired end-point of research to remain a bottom -up practice can therefore be a barrier for top-down desires about research areas;
4. Differences between human, social and natural science: The practice of science looks different in different academic disciplines, which makes it difficult to define one single end-point for research and innovation. Some disciplines have, for instance, difficulties in relating to the meaning of the concept innovation that may have a more clear meaning in some natural science disciplines. The fact that the practice of science, and also the role in the development of society that different academic disciplines play, can be a barrier to achieve to narrowly defined end-points for research and innovation;
5. Competition (rankings, funding): Universities live in a competitive environment where their performance often are measured in rankings. Depending on what kind of ranking different universities consider as important collaboration with universities that may be ranked lower will not be prioritized;
6. Existing research collaboration (why develop new instead of invest in existing stable collaboration): Much research is already conducted in different types of collaborations between researchers at different universities. Establishing well-performing research collaborations across disciplines and universities takes time, and potential unwillingness to give up well functionating teams and invest in establishing new research teams may therefore be a barrier;
7. Research profiles (basic research versus applied research): Different universities may have different profiles in their view of what type of research they are engaged in, such as basic or applied research. Such different profiles can be a barrier for establishing research collaboration.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Table 1 – Module 1: Desired End-points & Preliminary Roadmap

Desired endpoint	Reasons	Actions	Timing	Possible Barries/Risks	Indicators
Establish research collaboration based on emerging bottom-up excellent research generated in academic freedom Establish systematic information about research profiles, researchers and research support unites at the partner universities in order to ease for researchers with similar interests to get in touch, and also for research support staff to establish a contact in order to develop joint projects and programs with the potential to support research collaboration across universities.	• A central argument for why this is desirable is that areas for excellent research cannot be decided from outside academia; • Moreover, achieving excellence in research and also establishing sustainable and creative research collaboration take time and have to be based on research interests and trust between researchers in combination with the necessary funding; • Research excellence is not automatically achieved by setting up collaborations between universities. Collaborations must add something otherwise it may be contra-productive and cause important results to be missed.	• Contact lists and communication about research profiles at the respective universities are essential for facilitating emerging collaboration between researchers; • Support initiatives for emerging research collaboration; • Funding for bottom-up collaboration initiatives.	Followed up in three-year circles.	• HR and financial resources: Researchers may be occupied with teaching and other on-going research that make it difficult to engage in new research with researchers they do not know. Often research develops between researchers that know each other and after having found people they like to collaborate with their will to change to new partners might not be so strong. Finanicial resources are also crucial. It will be difficult to build new research teams without funding; • Academic freedom: Collaboration, especially around topics decided by central units or politicians, may interfere with the principle of academic freedom. This possible barrier is related to what role research is expected to have in society and if research topics are decided outside of academia or by university boards. Consequently, academic freedom can be a barrier to collaboration; • The view of how research excellence is achieved (top-down or bottom-up): The dominant view of how research excellence	•Establish systems for following up attempts for research collaboration taken, such as registering jointly authored publications between scholars from different universities; •Follow up if research collaborations are established in funded projects etc.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

				best is achieved among the partner universities is a bottom-up perspective. This can be a barrier to desired research focus on, for example the CIVIS Hubs if this is not the kind of research the partner universities have their excellence in. The desired end-point of research to remain a bottom -up practice can therefore be a barrier for top-down desires about research areas; • Differences between human, social and natural science: The practice of science looks different in different academic disciplines, which makes it difficult to define one single end-point for research and innovation. Some disciplines have, for instance, difficulties in relating to the meaning of the concept innovation that may have a more clear meaning in some natural science disciplines. The fact that the practice of science, and also the role in the development of society that different academic disciplines play, can be a barrier to achieve to narrowly defined end-points for research and innovation; • Competition (rankings, funding): Universities live in a competitive environment where their performance often are measured in rankings. Depending on what kind of ranking different universities consider as important collaboration with universities	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

				that may be ranked lower will not be prioritized; • Existing research collaboration (why develop new instead of invest in existing stable collaboration): Much research is already conducted in different types of collaborations between researchers at different universities. Establishing well-performing research collaborations across disciplines and universities takes time, and potential unwillingness to give up well functionating teams and invest in establishing new research teams may therefore be a barrier; • Different universities may have different profiles in their view of what type of research they are engaged in, such as basic or applied research. Such different profiles can be a barrier for establishing research collaboration.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Module 2. Sharing Infrastructures

The main goal of Module 2 is to establish a strategy that would allow for joint use of the RIs that are available in all CIVIS Alliance institutions. To achieve this goal, Module 2 is focused on the following aims:

1. **Identification and mapping of the RIs** (including e-infrastructures) that are available in the CIVIS Alliance Members;
2. **Design of methods that would allow sharing of the RIs** both within the CIVIS Alliance and with relevant external stakeholders. For this activity, two distinct approaches were followed: i. first the creation of a common information access point of RIs managed by each CIVIS Alliance member that would address financial, legal, regulatory, logistical and other barriers and ii. second is the establishment of a joint strategy for RIs development and usage that would address the aforementioned obstacles and would also propose an economic model.

Methodology & Procedure applied to data collection

In the context of the CConsensus-building phase, the activities of Module 2 aimed at:

- completing the analysis of legal, logistical and financial barriers hampering the use of research infrastructures both (1) between the CIVIS Alliance members and (2) by other stakeholders;
- identifying a proposal for the establishment of one single access point to open research infrastructures across the Alliance and their conditions of use;
- elaborating a model for the shared exploitation of CIVIS research infrastructures;
- identifying infrastructure(s) that would ideally be the object of a CIVIS upgrading (such as the possibility of any RI to apply for a label procedure, by accepting the commitment to the common Charter of principles).

During task 2.1 which concerned providing an overview of desired end-points of Module 2, the following methodological steps have been carried out:

1. Identification of information to be made public for each RI (among the ones collected in the previous phase);
2. Analysis of RI openness to CIVIS institutions and to external stakeholders;
3. Analysis of the current barriers, starting from analysis of M2 section of WP1 report and from detailed analysis of the specific data collected for M2 Report;
4. Definition of RI one single access point and of a Joint strategy for the creation of a CIVIS label (as desired ending points), also taking into consideration the analysis of existing specific practices.

In this regard, the following activities have been performed:

a) first definition of an IT tool/platform representing a showcase of CIVIS open RIs, which represents the first part of the model to be implemented in order to achieve the objective of sharing research infrastructures at the Alliance level. In this regard, the content structure of the IT tool, i.e. the types of information to be showed in the IT tool has been identified. Secondly an update of the information previously collected, related in particular to RI access conditions, has been performed. Finally, further missing information have been gathered;

b) the second component of the proposed Model has been identified, i. e. the definition of the key aspects of a Joint strategy for the creation of a CIVIS Research Infrastructure Network/Label.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

During task 2.2 which concerns developing Roadmaps Module 2 work team has been committed to the following tasks:

a) As for the IT tool, an in-depth analysis of the updated and additional information collected on each RI has been performed. Moreover, activities aimed at supporting the technical design of the IT tool by CIVIS IT staff have been started;

b) As for joint strategy for the creation of a CIVIS Research Infrastructure Network/Label, during this sub-phase, a procedure to apply for the label has been defined and the opportunity to elaborate a CIVIS RI charter linked to the awarding of the label has been deeply analysed.

Finally, during the current sub-phase some meetings with other Modules leaders have been planned in order to share the respective results and to possibly integrate some achievements, so enriching the results emerged from Module 2 as well as integrating them as much as possible with other Modules in the common framework of RIS4CIVIS project. These meetings demonstrate how work group interconnections are useful during these phases of the project, so this methodology will be applied also in the next phases.

All the relevant documents have been uploaded on the corresponding **CIVIS Cloud folder** devoted to Module 2.

Meetings

- **Meetings in total: 5.**
- **Internal Module 2 meetings: 4.** During the meetings, objectives, methodological approaches and results have been shared and discussed among Module 2 team. (September 6th and 28th 2021, and 19th October 2021 and 22nd November)
- **Other Meetings 1.** Meeting with CIVIS IT staff regarding technical aspects related to the construction of the IT tool (7th October).

Results: Module 2 - Desired End-points & Preliminary Roadmap

The Module 2 has selected **two main end-points**:

1. IT tool/online interactive platform, showing all CIVIS open RIs

The first component includes the establishment of one single information access point to CIVIS RIs by the use of a joint online interactive platform. This access point will include RIs available to joint use, even if only partially, by any user belonging to CIVIS institutions and eventually to external users, i.e. users not belonging to CIVIS Alliance, including CIVIS partner organizations and most of all businesses.

The online info point platform is configured as an online showcase of infrastructural resources and competencies for the benefit of the entire CIVIS community. The main aims of the tool are the following ones: 1) to promote awareness by the CIVIS scientific community about the RIs available for R&I activity; 2) to foster efficient use of RIs; 3) to strengthen R&I capacities by CIVIS institutions; 4) to enhance RI visibility towards possible non CIVIS external users. The info point will include the following information:

- Acronym of the RI;
- Extended name of the RI;
- Scientist in charge;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

- Contacts for information on the access;
- Key words identifying specificity of the RI;
- RI description;
- Belonging CIVIS Institution;
- Services provided;
- RI web page;
- Link to usage regulations (if available);
- Link to access fee regulation (if available);
- Research activities implemented by the RI;
- Technology Transfer and Innovation activities implemented by the RI;
- Third Mission activities implemented by the RI;
- Educational/Training activities to be implemented by the RI.

The tool will also include a "search" field by key words identifying the scientific specificity of each RI. It will be possible to cluster the available RIs by the 3 ERC sectors: Social Sciences and Humanities (SH); Physics and Engineering (PE); Life sciences (LS).

Moreover, the platform will have a dynamic character, meaning that it will allow to update the information already shown and to add additional RI files.

2. Definition of a joint strategy for the creation of a CIVIS Research Infrastructure Network (for the short-term) and a CIVIS Research Label (at a long-term: possible implementation of the label after the end of RIS4CIVIS project onwards)

The second component will include the definition of a long-term joint strategy for the creation of a CIVIS RI label. The creation of a CIVIS label will be preceded from a pilot procedure - aimed at creating a CIVIS Research Infrastructure Network and corresponding to RIS4CIVIS project duration. The label can be used by all RIs identified in the Alliance member institutions as open to a shared use (complete or partial) and to adopt the same general principles in terms of use regulation. The label – to be concretely implemented in a medium-long-term, i.e. after the end of the project duration - would be valid for a limited number of years (eventually renewable). So the RI label should in the long-term identify a CIVIS Research Infrastructure, capable of ensuring high quality and openness of services provided from the labelled RIs.

The benefits of using this label would be:

- Increased awareness regarding RI availability throughout CIVIS community;
- Visibility of RIs also towards non CIVIS users;
- Facilitating the use of RIs;
- Efficient use of RIs;
- Transparent access within a common framework and shared principles;
- Benefiting from different services supporting RI development;
- Sharing of competencies and expertise;
- RI Networking.

Its main objectives are:

- To clearly identify RIs open to access by researchers of other CIVIS institutions;
- To promote and disseminate high-level technologies to the academic and industrial sector, as well as provide relevant services to research laboratories and, eventually, external stakeholders' needs;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

- To foster S&T collaborations among CIVIS partners;
- To create a critical mass of resources and competencies capable of fostering joint participation in international calls for proposals aimed at funding RIs;
- To share scientific and technical skills and expertise;
- To provide a certified regulation framework for greater efficiency and responsiveness (transparency and quality management assurance);
- To organize dissemination, information, networking events, as well as advanced training activities related to the use/maintenance of RIs, targeted to internal users and stakeholders;
- To eventually foster the potential of SSH RIs, especially in view of the current developments of EIT.

As for the label application model, three main elements have been analyzed and discussed in the Roadmap phase:

1) Definition of a set of principles, able to guarantee the optimal quality of RI services, to be incorporated in a common Charter;
2) Establishment of a scientific board (including a representative from each CIVIS Partner);
3) Timing for the implementation of the labelling procedure.

To be noted, as for the management aspects, that each RI would be managed in a decentralized way.

The achievement of the desired end-points proposed will mean that RIS4CIVIS has to face not just a new phase concerning a major definition of the joint strategy to the implementation of the CIVIS Research Infrastructure Label, but also - and which is more relevant to RIS4CIVIS - the project has to open a way/path to easily share CIVIS Alliance RIs as remarked in the proposal aim.

The table below shows the main information related to the identified end-points, the reasons for achieving the end-points, some possible indicators to measure the effectiveness of the actions put in place to achieve the end-points, the timing to reach it, potential barriers/risks which could impede reaching the end-points.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Table 2 – Module 2: Desired end-points & Preliminary Roadmap

Desired end-points	Reasons	Timing	Indicators	Possible Barries/Risks
1) Establishment of one single information access point to CIVIS open RIs by the use of a joint online interactive platform	• **To increase awareness regarding RI availability** throughout CIVIS community • **To increase efficiency** in the use of RIs • **To enhance visibility of RIs** also towards non CIVIS users • **To foster cooperation with private sector/Industry**, as desired user of RI	Month 15: release of a prototype of the online interactive platform	• Number of CIVIS RIs open to the entire CIVIS community • Number of CIVIS RIs open to non CIVIS external users Openness degree (in terms of time %) of each RI	The creation and the release of the IT tool to be used as a showcase of CIVIS RIs depends on the work to be implemented by IT technicians
2) Proposal of a Joint Strategy for the creation of a CIVIS RI network (in the short-term) and of a CIVIS RI label (in the long-term) **The label system would be in fact concretely implemented from the end of the project onwards**	• **To guarantee RI access** within a common framework and shared principles • To benefit **from different services supporting RI development** • **To share competencies and expertise at a CIVIS level** • **To foster Networking between RIs** • To define in a clearer and **more transparent way RI usage regulation** in order to make the RI access smoother • To clearly **address IPR management principles** • **To foster cooperation with private sector/Industry**, as desired user of RI	Month 15	Definition of the RI network/label strategy proposal	The willingness to apply for the label depends on political decisions at each RI level and at each CIVIS institution level
		From Month 16 (Case study phase)	Number of RIs applying for the label test (**RI networking**)	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Module 3: Reinforcing Academia-Business R&I Cooperation

Module 3 is focused on setting out systems and practices to maximise the Alliance's ability to foster interactions with the non-academic sector – through cooperation and bi-directional transfer of knowledge, but also by increasing the innovation capacities of each of our institutions as well as that of actors in their regional research ecosystems, aiming to improve support to the whole innovation chain.

Module 3 objectives are:

- To develop a joint process to detect, assess and accompany innovation within the CIVIS Alliance, that is based on exploiting the added value of the Alliance:
    - Interconnecting our innovation ecosystems: CIVIS innovators will have access to the combined regional and national innovation ecosystems (and Regional Smart Specialisation Strategies) of *all* Alliance members, in addition to the European innovation ecosystem;
    - We will interconnect our competencies: CIVIS innovators will be able to obtain personalised assistance and mentoring from the most appropriate specialist in the Alliance.
- To further develop University-Business Cooperation by assisting CIVIS members to develop innovation capacity where they have none.

Methodology & Procedure applied to data collection

During the Benchmarking phase, complementary skills of all CIVIS partner universities have been identified. A transferable skills scheme has been created referred to the Innovation Accompaniment Program of the Grant Agreement (page 109).

In accordance with all representatives of Module 3 the methodology of knowledge transfer within learning pairs, the so-called tandems, was applied. Therefore, a Module meeting with an open discussion of the next steps during the C Consensus-building phase took place.

The tandem matching is based on the results of the first questionnaire and specific mapping of barriers and best practices collected during the Benchmarking phase. First, the availabilities of all representatives within Module 3 were queried and project guidelines were prepared for each tandem. In total four tandems were set: AMU & SUR, NKUA & SU, UAM & UT, UB & ULB.

As a basis, the mapping of complementary skills of the BBenchmarking phase has been used. In addition, guidelines, action plans and key questions for each tandem meeting were prepared by the Module leader.

Through the tandem meetings held online, specific Innovation Management best practices, activities, tools and approaches have been exchanged. In the first two-hour tandem meetings, each tandem partner asked targeted questions related to essential Innovation Management activities. The format of the tandem guaranteed a detailed look behind the scenes and goal-oriented discussions took place. The tandem partners identified the specific topics they wanted to focus on.

The tandem of AMU & SUR discussed the topics of the knowledge triangle, regional ecosystems and TTO offices. Both responsibles of the universities prepared presentations for the tandem meetings. SUR presented an extension of the knowledge triangle, the quadruple helix model. An expert, the head of the technology transfer office of SUR, participated in the second meeting; thus question could be

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

directly addressed. The representative of AMU explained in detail the innovation ecosystem of AMU. Different actors and their functions of AMU`s one-stop shop CISAM were shown to all participants in the meeting. As a need the representatives defined linking fundamental research with applied-oriented approaches.

NKUA & SUR focused on training measures in terms of innovation and regional ecosystems within the tandem meetings. New approaches of accelerating technology transfer were presented to each other. Barriers in terms of intellectual property, commercialization of research and greyzones in terms of patenting ideas were discussed. In the second tandem meeting an exchange of end-points took place. The representatives found similarities in terms of their end-points and gave each other advice on how to raise awareness about the importance of IP.

UAM & UT focused on the Innovation Strategy and identified the development of an Innovation Culture as an important milestone. Creative approaches for raising awareness of innovation management themes, such as podcasts and innovation talks, were presented by UAM. In addition, Innovation Ecosystems were explained to each other in the second tandem meeting.

UB & ULB focused on the exchange of the activities of the technology transfer office, the innovation ecosystems, raising awareness of Innovation-Related Measures and increasing the acceptance of innovation by students & researchers. Therefore, an expert of ULB joined the first tandem meeting and directly answered questions of UB. An important advice was the identification of clusters in applied-oriented technologies and innovation. In addition, starting with one best practice could help UB to strengthen the regional innovation ecosystem. Furthermore, the representatives of UB & ULB discussed that the exploitation of more research results could be a way to raise awareness for innovation activities. The RIS4CIVIS network and the European Union are assessed as essential frames; thus more projects should be realized in future.

A first alignment was made between the current situation and relevant end-points to be reached. Each university has chosen about 3 main end-points that should be addressed on a short-, mid- and long-term. After the first meeting each representative of every university screened the own end-points and filled in the action plan. The end-points were discussed internally by the respresentatives of the university and relevant functions and units.

The second tandem meetings can be seen as follow-up meetings of the first tandem meetings. Within these meetings it was further discussed how specific end-points can be reached and which types of activities are necessary to reach these defined goals. Presentations on different topics were prepared and held within the meetings. Therefore, the university representatives identified relevant responsibles and experts that joined the meetings and could reply directly to specific questions.

Innovation-management tools were shared within the tandem working groups and tandem partners gave advice to each other, how the situation can be improved in the future and which tools, trainings might be necessary. Fruitful discussions took place, and a direct exchange of feedback gave detailed insights about the current situation and next approaches.

The methodology of the tandem meetings encouraged representatives of all universities to participate actively, and themes could be edited deeply. Relevant innovation-management topics could be discussed precisely. Within the work in small groups certain and chosen topics of the universities could be addressed directly, synergies could be encouraged, and authorities and responsibilities were clearly distributed. It was possible to analyze the end-points and themes in-depth that should be focused during the next months.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Meetings in total:

Number of Tandem Meetings within Module 3: 8 meetings, each two hours
Number of Cross-Module Meetings: 2 meetings, each ~ 1 hour
Number of Module 3 Meetings: 1 meeting, 1,5 hours
Other meetings: 1 physical meeting staff exchange UB-UT,2-3 days with insights on specific themes in administration and research
Meeting with Open Lab coordinators & Module 6: 1 meeting, ~ 1 hour

The following table details the Module 3 meetings and tandem meetings which took place during the first period of the Consensus-building phase.

Date	Type of Meeting	Participants	Key Points	Documents produced
18/07/2021 09:30 – 11:00	Module 3 Meeting	All representatives of every CIVIS university	• Feedback of Benchmarking report • Acknowledgment to all representatives • Presentation of Consensus-building phase • Timeline and organization of work (Tandem Meetings)	• Presentation • Schedule Tandems
26/09/2021 15:00 - 17:00	1st Tandem Meeting UAM – UT	José Luis Pau (UAM), Elena Dornheim (UT)	• Exchange of best-practices regarding the Innovation Strategy • Exchange of best-practices regarding the Innovation Culture	• Presentation Tandem • Minutes
26/09/2021 15:00 - 17:00	1st Tandem Meeting NKUA – SU	Antonis Livieratos (NKUA) Katerina Kadena (NKUA) Konstantina Skolariki (NKUA) Mats Danielson (SU) Tor Regberg (SU) Elena Dornheim (M3, UT)	• Exchange of knowledge and best-practices in terms of IP and technology transfer	• Presentation • Minutes, • Paper of Accelerating technology transfer (NKUA) • Paper in Innovation Studies (SU)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Date	Type of Meeting	Participants	Key Points	Documents produced
01/09/2021 15:00 - 17:00	1st Tandem Meeting UB – ULB	Mihnea Dobre (UB) Filuta Ionita (UB) Leticia Martinez Garcia (ULB) Isabelle Lefebvre (ULB) Elena Dornheim (M3, UT)	• Exchange of knowledge in terms of the technology transfer office	• Presentation • Minutes • Presentation of Solvey school (ULB)
02/09/2021 15:00 - 17:00	2nd Tandem Meeting NKUA – SU	Antonis Livieratos (NKUA) Konstantina Skolariki (NKUA Tor Regberg (SU) Elena Dornheim (M3, UT)	• Discussion of end-point goals	• Minutes • Table with End-points and necessary activities
08/09/2021 09:00 – 11:00	1st Tandem Meeting SUR – AMU	Charlie Barla (AMU) Alice Novello (AMU) Maria Cristina Di Giovancarlo (SUR)	• Exchange of regional innovation ecosystems and TTOs	• Minutes • Presentation
08/09/2021 15:00 – 17:00	2nd Tandem Meeting UB – ULB	Mihnea Dobre (UB) Filuta Ionita (UB) Leticia Martinez Garcia (ULB) Elena Dornheim (M3, UT)	• Exchange of knowledge in terms of innovation ecosystems and innovation training	• Minutes • Presentation
10/09/2021 15:00 – 17:00	2nd Tandem Meeting UAM – UT	Jochen Hirsch (UT) Jorge Álvarez (UAM) José Luis Pau (UAM), Elena Dornheim (UT)	• Exchange about innovation networks and regional ecosystems • presentation of the Industry Liaison Office & Innovation Grant (UT)	• Minutes • Presentation Innormadrid, k-node • Presentation Innovation structures University of Tübingen • End-points
17/09/2021 12:00 – 14:00	2nd Tandem Meeting AMU – SUR	Charlie Barla (AMU) Alice Novello (AMU) Maria Cristina Di Giovancarlo (SUR) Daniele Riccioni (SUR)	• Exchange about knowledge triangle • Exchange about innovation ecosystems	• Presentation knowledge triangle & quadruple helix, TTO (SUR) • Presentation CISAM (AMU)

It is planned to share the outcome of the tandem meetings within Module 3 and in the upcoming cross-Module meetings. Expert meetings are organized for all interested representatives within Module 3. The topics identified are: Intellectual Property, Innovation Grants, Industry Liaison Office, Knowledge Transfer, Startup Support in a university context, development of an innovative, collaborative workshop.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

The documents produced within the tandem meetings will be available in the RIS4CIVIS folder of Module 3. Representatives of Module 3 will be asked to add further amendments.

Regarding the definition of the desired endpoints, initially, they were identified by each single university itself. The key questions were formulated to give the Module 3 representatives a definition of the terms: current situation, input, activities, barriers, desired end-points and time frame. The representatives prepared an initial list of the endpoints and filled out first parts of the table on their own. In the follow-up tandem meeting short-term, mid-term and long-term endpoints referred to improving the main innovation management activities were discussed together with the tandem partner and Module 3 leader. After the meetings the list was refined by each representative.

Results: Module 3 - Desired End-points & Preliminary Roadmap

The preliminary roadmap is based on the results of the benchmarking phase and in-depth mapping of endpoints during the consensus-building phase. In addition, a consensus was built to focus on the key objectives of Module 3. The work carried out in those two phases helped to gain insight into the individual situation and understand the needs of each single university related to innovation management activities. It was the first critical step to gain transparency about the desired outcomes, possibilities and the current state.

During the last months in the consensus-building phase, necessary activities could be identified to achieve the desired endpoints. It is recommended to constantly track the activities that feed that preliminary roadmap and adjust them where it is needed. It should be taken into consideration that not all universities have one common starting point and the same desired endpoints in each of the innovation management activities. The common goal can be seen in improving the innovation capabilities. High correspondences can be found in many of the innovation activities, common interests and challenges.

1. Key objectives of Module 3 Consensus-building phase

The following steps were discussed within the Module 3 meeting together with all representatives:

- Development of "Innovation Reference Points" through the mapping of Innovation Management activities in the tandem meetings
  - Results of the benchmarking phase about the current status of each university
  - Results and discussions within the tandem meetings during the consensus-building phase
- Design of a common Innovation Accompaniment Programme
  - Knowledge transfer during the consensus-building phase within the tandem meetings
  - Identification of innovation management topics of common interest during the consensus-building phase
  - Dynamic Glossary of Innovation Management terms, initiated during the benchmarking phase
  - Innovation Management Handbook (in progress)
- Develop and propose approach to IPR for innovations of Innovation Accompaniment Programme
  - Finding common approaches together with M5

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

- Identifying similar CIVIS activities and learning from it
- Organizing expert meetings

- Develop a catalogue of "innovation training", based on current CIVIS offer and developing additional courses as required
  - Library of Best-Practices of Module 3 initiated online within the benchmarking phase
  - Guidelines developed within consensus-building phase: use of indicators in innovation management, guideline for fostering a positive innovation culture, guideline for formulating & implementing an innovation strategy
  - Presentations of representatives of Module 3
  - Cross-Module activities (M3, M4, M5 & M6)
  - First RIS4CIVIS Staff exchange planned: UB-UT, had to be postponed due to regional pandemic situation

2. Endpoints selected

Transfer of knowledge and knowhow was prioritized by most of the representatives of Module 3. This transfer of knowledge affects all four key areas of innovation management: innovation strategy, innovation culture, innovation capabilities and innovation structures. This endpoint can be seen as one part of the key objectives of Module 3: the Innovation Accompaniment Programme.

The representatives want to build strengths and reduce weaknesses by the exchange of knowhow and knowledge. Information and support should be easily accessible. Individual exchanges of innovation topics have been already addressed during the consensus-building phase within the first tandem meetings. The following innovation management topics were discussed: *Knowledge triangle (Quadruple Helix Model), Regional Innovation Ecosystems, TTO Offices, Accelerating the technology transfer, grey zones in terms of patenting & IP, Training Measures, Innovation Strategy, Creation of a guideline for the Innovation Strategy, Development of an Innovation Culture and Raising awareness of Innovation Management activities.*

Innovation management themes should be incorporated in the working sessions together with all Module 3 representatives and further interested parties. Topics of common interests identified are: *Intellectual Property Rights, Innovation Grants, Industry Liaison Office, Knowledge Transfer, Start-up support, development of creative, collaborative workshops (Identification of possible topics for the case study).*

Essential activities to reach this endpoint have already taken place and will play a major role in future. Because of this "Transfer of knowledge and knowhow" is a short-to-long-term goal.

Exploitation of the results & improvement of outcomes of research is also highly ranked. This endpoint includes two essential innovation management activities that have already been identified during the benchmarking phase and can be allocated to one key element of innovation: the Innovation Capabilities.

The purpose of this goal is mainly to enhance interactions with industry and implement results of fundamental research into practice. This endpoint requires major changes such as awareness raising or hiring people with innovation management background. For this reason, it can be categorized as a mid-to-long-term goal.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Develop & foster an innovation culture was selected by the majority of CIVIS partners, because no innovation culture is existing. Developing and fostering an innovation culture is clearly a long-term goal. An orchestra of many wisely selected activities is necessary to nudge a positive innovation culture. A checklist for promoting a lively culture of innovation can be found within Annexes **Erreur ! Source du renvoi introuvable.**.

Necessary activities collected within the CIVIS network are the accessibility of innovation spaces and hubs, the development and implementation of the innovation strategy, fostering innovation programs, involving the top management, sharing experiences with other universities and sharing successful innovation projects in other departments/ campuses.

Participation in a bigger EU project is also one of the endpoints considered as important during the consensus-building phase. The incentives behind are to improve the university`s network and the opportunities for funding. Possible activities to reach that goal are to create a roadmap of 3rd party funding and a data base of existing initiatives and future plans.

The creation of a data base and roadmap requires the coordination with many experts and the development of a user-friendly digital platform; thus, it can be only implemented in the long run.

Start-up support is an innovation topic most of the representatives are interested in. Positive effects are targeted by this action in strengthening innovation ecosystems and building functional structures. It is assessed as a mid-to long-term goal, because an alignment with different stakeholders has to take place, pilot projects should be provided and new models of collaborative innovation developed. Furthermore, awareness has to be raised that students and researchers participate actively.

Develop and formulate an innovation strategy is chosen by representatives of Module 3, because those universities feel that the current innovation strategy is not coherent, poor or non-existent. The strategy should describe how an organization will reach its set goals. For the development and formulation of an innovation strategy the involvement of experts that are familiar with the overall strategy of the institution is necessary as well as the alignment with various departments. A guideline elaborated during the consensus-building phase within Module 3 (see Annexes **Erreur ! Source du renvoi introuvable.**) can be supportive for that purpose.

Implementation and adaptation of an innovation strategy. As soon as the innovation strategy is formulated and aligned with all identified stakeholders, the implementation can be initiated. Therefore, an improvement of the right innovation capabilities might be necessary and regular meetings with responsibles of the institution should be held. Due to the pre-planning and alignment with many different entities this goal is allocated on a mid- to long-term scale.

Patent portfolio & portfolio of market-oriented innovations is an endpoint that is partly related to the "exploitation of the results & improvement of outcomes of research". Representatives of the universities focus on this goal since they want to build more licence patents or establish a patent portfolio.

Many activities which may run simultaneously are crucial such as identifying common interests of partner universities and excellent skills, identifying common patterns within the CIVIS network, implementing IP and research processes, awareness raising through showcases and best-practices in the academic environment.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Due to the challenges such as finding common domains and the complexity of this topic it should be seen as a mid- to long-term goal.

Awareness raising using innovation measures was selected by Module 3 participants to increase the interest of students, PhD students, researchers and professors to take advantage of innovation support and the use of innovation measures.

Activities planned to reach this endpoint are arranging seminars for the target group and involving the TTO and professionals on innovation training. The challenge of awareness raising is also a longer process and for that reason this endpoint is declared as a mid-to-long-term goal.

3. Selection and use of indicators

The use of valuable indicators in terms of innovation management activities is combined with high complexity. Effects of activities can often not be seen on a short term. In fact, many influences of innovation management activities are only noticeable on the long scale. Quality is one of the most important criteria for the assessment of the results of the activities.

In addition, the indicators should be carefully chosen since they influence the staff and members of an institution or organisation tremendously. Within the CIVIS network each institution has its individual background; thus, the indicators should be tailored to the corresponding situation by responsibles or specific departments of each university.

Recommendation for the use of indicators in innovation management at one glance:

- the indicators should be balanced between input and output indicators
- they should equally include the four key elements of innovation management: capabilities, structures, strategy and culture
- less indicators as possible should be used
- the indicators should be aligned with the overall strategy, innovation strategy and progress of each institution (Isomäki, Kylliäinen, Nieminen, Prof. Dr. Hirsch, & Dornheim, 2021, S. 177)

It is planned to provide a more detailed list of indicators and innovation metrics after further experts, entities and the representatives of Module 3 have agreed to the selection.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Table 3 – Module 3: Desired End-points & Preliminary Roadmap

A summary of the endpoints of all CIVIS partner universities can be seen in the table below. Similar interests and common endpoints targeted could be found in the following innovation management activities: Transfer of knowledge and knowhow (7), Exploitation of the results & improvement of outcomes of research (6), Development & promotion of an innovation culture (5), Participation in a bigger EU project (4), Start-up support (4), Development and formulation of an innovation strategy (3), Implementation and adaptation of an innovation strategy (3), Patent portfolio & portfolio of market-oriented innovations (3), Awareness raising using innovation measures (3). A first priorisation of the essential desired endpoints could be carved out by the frequency of responses.

All contributions for possible activities, potential barriers are listed. This table together with the results of the benchmarking phase, objectives of Module 3 in general and discussions within the consensus-building phase serves as a basis for the Preliminary Roadmap of Module 3. The table is ranked according to the time frame from short – to long term. Some of the short-term activities have been already initiated by the universities and during the consensus-building phase within Module 3.

Desired end-points	Reasons	Actions	Timing	Indicators	Possible Barries/Risks

Transfer of knowledge and knowhow (7)	• Build strengths & reduce
	• Build synergies & networks weaknesses
	• Acquire support
	• Form a dedicated team at the CIVIS level
	• Reach clear information when it is needed
		• Workshops & trainings (e.g., tandem trainings, expert meetings & staff exchange based on: individual strengths, weaknesses, needs, interests)
		• Catalogue of transferable skills (innovation management, entrepreneurship)
		• Digital exchange
		  ○ CIVIS box
		  ○ Expert data base
			Short- to long-term	• Creation of a webpage that is user-friendly
				• Need of test runs of the webpage
				• Continuous maintenance
				• Creation of leads to raise awareness
				• Administration of funding and grants
				• Timeframe of training offer and course programs
				• Registration and actual participation
				Format of the training dependent on number of participants
					• Creation of a webpage that is user-friendly
					• Need of test runs of the webpage
					• Continuous maintenance
					• Creation of leads to raise awareness
					• Administration of funding and grants
					• Timeframe of training offer and course programs
					• Registration and actual participation
					• Format of the training dependent on number of participants

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Development and formulation of an innovation strategy (3)	No existing and no coherent innovation strategy	• Involving experts who are familiar with the overall strategy • Deep-dive into SWOT analysis • Define the type of innovation strategy • Involving various departments Using the guideline to create an innovation strategy (developed within Module 3, RIS4CIVIS)	Short-to mid-term	• Identifying the right people • Finding alignment and covering all participants' needs • Identifying all values and management principles of the university Having a common vision	• Identifying the right people • Finding alignment and covering all participants' needs • Identifying all values and management principles of the university • Having a common vision
Exploitation of the results & improvement of outcomes of research (6)	• Implementation of results of fundamental research should be improved • Need for more alternatives to develop innovations • Enhance interactions with industry • Build more start-ups and licensed patents	• Hiring people with innovation management background • Raise awareness & incentives for researchers Training in marketing economics market research	Mid- to long-term	• Risk to lose strength in fundamental research • Lack of capacities Interest of researchers and fundamental research	• Risk to lose strength in fundamental research • Lack of capacities • Interest of researchers and fundamental research
Implementation and adaptation of an innovation strategy (3)	No established or no coherent innovation strategy	• Fostering the right innovation capabilities and innovation structures • Exchange of knowledge • Innovation via the CIVIS network Innovation round tables of internal university departments	Mid- to long-term	• Finding the right timing • Implementing the right type of strategy (functional or meta strategy) • Adapting the innovation strategy to the individual needs of the university	• Finding the right timing • Implementing the right type of strategy (functional or meta strategy) • Adapting the innovation strategy to the individual needs of the university
Patent portfolio & portfolio of market-oriented innovations (3)	• No patent portfolio • Building more license patents	• Identifying common patterns of CIVIS universities • Finding one activity where partner universities have interest and excellent skills • Promotion and dissemination • Implementation of IP and the research process • Information for researchers	Mid- to long-term	• Finding a common domain • Compatibility with fundamental research • Barriers especially in fields that are not practice-orientated	• Finding a common domain • Compatibility with fundamental research • Barriers especially in fields that are not practice-orientated • IP: complex topic who had the initial idea? Legal issues

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

		Build showcases/ reference cases of best-practices in the academic environment		IP: complex topic who had the initial idea? Legal issues	
Start-up support (4)	• Strengthening innovation eco systems • Building functional structures • Coordination of innovation eco systems with local authorities	• Experience exchange with representatives of the industry • Dissemination of start-up opportunities in faculties and research centres • Providing pilot projects to showcase • Development of new models of collaborative innovation	Mid- to long-term	• Finding common spaces for large companies, start-ups and researchers • Covid-19 pandemic makes it difficult to interconnect people • Low interest of students	• Finding common spaces for large companies, start-ups and researchers • Covid-19 pandemic makes it difficult to interconnect people Low interest of students
Awareness raising using innovation measures (3)	Interest for more innovation support	• Arranging seminars for students and PhD students, professors and researchers Involvement of university technology transfer office and professionals on innovation training	Mid- to long-term	• Lack of certification as credits on the CV Organizational costs	• Lack of certification as credits on the CV • Organizational costs
Development & promotion of an innovation culture (5)	• Increase innovation cultures and innovation activities • No existing innovation culture	• Accessibility of innovation spaces and hubs • Development and implementation of the innovation strategy • Fostering innovation programs • Involving the top management • Sharing experiences with other universities Sharing successful innovation projects in other departments/ campuses	Long-term	• No coherent or existing innovation strategy • Coordination with other university buddies	• No coherent or existing innovation strategy • Coordination with other university buddies
Participation in a bigger EU project (4)	• Improving the network • Improving the funding	• 3rd party funding • Create a roadmap of 3rd party funding programs • Database of existing initiatives and future plans	Long-term	• Data protection • Bureaucratic efforts • Dynamic situation of each university	• Data protection • Bureaucratic efforts • Dynamic situation of each university

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Module 4: Strengthening Human Capital

Module 4 is focused on offering high quality and sustainable standards across our Alliance regarding the recruitment, mobility, training and working conditions of researchers, in full respect of the National legislations and of each university policy regarding its HR management.

The objectives are to identify and develop where possible high and common standards, in conformity with the principles of the European Charter for Researchers and Code of conduct and the Human Resource Strategy for Researchers (HRS4R) Label, in the following areas:

- **OTM-Recruitment** (Open, Transparent and Merit-based), including non-discrimination and gender balance strategies,
    - Promotion and facilitation of **triple-I Mobility:** international, intersectoral, and interdisciplinary;
    - Facilitating access to research position offers throughout the CIVIS Alliance by widely publishing them within the Alliance;
    - Also addressing virtual mobility, the hosting of international researchers and the issue of brain drain.
- Access to **Training and Continuous Development** – providing a range of courses and learning resources on transferable skills (*inter alia* to equip researchers to transfer the knowledge generated to other sectors – business, society, other academia through Open Science etc.), with a special emphasis on early-stage researchers;
- **Working conditions** to make CIVIS universities more attractive to researchers including female researchers.

Methodology & Procedure applied to data collection

The objectives of Module 4 are to set up high quality and sustainable standards across the CIVIS Alliance on recruitment, mobility, training and working conditions. The Benchmarking phase provided an overview of the practices to promote tripe-I mobility, hosting international researchers, training and career development support, etc. The partner Universities had different organisational structures and differed on the level of development of certain domains, but shared, in fact, similar obstacles and desired reinforcements for their institutions. The Consensus Building phase comes then as a practical exercise where partners can take common actions to address common objectives. In Module 4 there were two meetings during the month of July in which the results of the Benchmarking were presented and next steps were discussed. During the month of September there was a wrap-up meeting in which the desired objectives were also talked through. Nevertheless, having in consideration that during this phase thematic meetings to encourage transfer of knowledge have been set up, it is possible that some objectives are reshaped or new ones arise.

For the time being, Module 4 will concentrate efforts on practical actions for mobility and training and will promote brainstorming on working conditions and recruitment, which require further reflexion. In this context, the Module leader will be in touch with the other Modules to learn on possible joint projects and collaborations, i.e training on OS and Citizen Engagement, career development platform having academia and business in mind. Module 4 has also ties with several Task Forces within CIVIS: Doctorate, Open Science, Fundraising, Erasmus +, etc.

Objectives, methodological approaches and results have been shared and discussed among Module 4 team members during the meetings held on June 30th June 15th July, 23rd September, 13th October, 24th November.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

In the meantime, Cross-Module Meetings has been carried out in order to define transversal aims and potential collaborative actions to be put into practice. These meetings were held on 29th June and 9th September.

- **Internal Meetings Module 4**: 4th June 30th June 15th July, 23rd September, 13th October, 24th November meetings;
- **Cross Module meetings**: 29th June and 9th September;
- **Representatives**: between 7 and 10 (in the Modules), thematic meetings: 16;
- **Documents**: 5 minutes documents, one per meeting, whether Module meeting or cross-Module meeting, three power point presentations, one report for the roadmaps.

Results: Module 4 - Desired End-points & Preliminary Roadmap

As a result of the work carried out during the Consensus-building phase, a list of desired end-points, as well as a roadmap to reach those aims, have been elaborated.

The following sub-sections present the desired end-points and roadmaps created according to each dimension defined during the benchmark phase.

Please note that **short-term goals** refer to the objectives to be set within the upcoming 3-5 months, that is to say, by March/April 2022; **medium-term goals** refer to the objectives to be set between April 2022 to April 2023; **long-term** goals refer to the objectives to be set last year of the project and beyond.

1. International, intersectoral and interdisciplinary mobility

The Benchmarking report confirmed mobility as one of the main fields where CIVIS common initiatives can take place. In general, all universities are well equipped to welcome researchers, benefit from a good range of programs and national legislation does not hamper mobility extensively. Interdisciplinary and intersectoral mobilities were less developed than international mobility and most universities clearly rely on external funds before internal ones to enhance it. At the same time this information was analysed during the BBenchmarking phase, CIVIS3i was launched.

The CIVIS COFUND Programme for International, Interdisciplinary, Intersectoral Research and Training for Experienced Researchers (CIVIS3i, Granted under Horizon 2020 MSCA COFUND Programme, coordinated by AMU, with UAM, ULB and SUR as co-funded partners; NKUA, UT, SU and UB being associated universities), is an EU co-funded project for postdoctoral researchers that aims at offering researchers a comprehensive training and networking programme, integrating interdisciplinarity and intersectorality in research. Given this circumstance, Module 4 will focus on providing a solid base to researchers through a short and long-term mobility opportunities database from where other initiatives or projects could arise. This type of mobility will also be addressed to staff, through a train-the-trainer mobility program and other intitiatves such as mentorats or staff weeks, where transfer of knowledge and exchange of practices can take place.

The selected desired end-points for 3i Mobility are:

1. Collection of universities opportunities for outgoing and incoming researchers and development of a trainthe-trainer program,
2. Encourage collaboration and development of European mobility programs within CIVIS, i.e. HE MSCA, Cost Actions, CIVIS3i, Erasmus+ STA,
3. Awareness raising on the value of mobility,
4. Increase the number of tools available for researchers to travel, i.e. flexibility, welcome packages, contracts, incentives, etc. (HRS4R),
5. Advocate reduction of bureaucracy, internationalisation of administrative support, centralisation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

of certain services (support for research departments).

These end-points were selected having into consideration the Benchmarking report and also based on the objectives set up at the beginning of the project. Indeed, the purpose behind the end-points is to encourage mobility between the CIVIS scientific communities, provide an extended offer of mobility opportunities and raise awareness on the benefits of mobility through infodays, workshops, training, etc.

Even though discussion is and should be continuous, **four actions** have been looked at in order to achieve the desired ends for 3i Mobility: **1-Identification of National/Regional/Internal mobility opportunities, 2- Use of Erasmus+ STA, funds for short-term mobility, 3-Thematic meetings, 4-Studying a possible MSCA Staff Exchanges or Doctoral Netwroks project.** These four actions are described hereafter.

1.1 Identification of national/regional/internal mobility opportunities from each university with views to include them in the database of the CIVIS Digital Campus. The work of the Fundraising Task Force (Transversal Task Force of CIVIS) would also help to complete the database with the private foundations opportunities.

The aim of this activity is to facilitate the visibility of mobility opportunities within CIVIS, whether short-term or long-term, including fellowships, funds for secondments, short visits or conference/events attendance. All Universities will be able to put their opportunities on display through the Digital Campus and the CIVIS website.

a) Barriers and roadmap

- **Burdensome data collection** (short-term). Mobility opportunities can be difficult to identify if we take into account the number of bodies providing funds for mobility at different scales and purposes. Flexibility for researching the calls could be provided. If after analysis, further efforts should be made to complete the list a second deadline could be set up. The Fundraising TF is also collecting private sector mobility opportunities;
- **Eligibility criteria of the funds** (short-term). It will be possible to address gaps that are not covered by the opportunities collected. If there are none, it may be possible to consider the organisation of mobility opportunities addressing certain scientific domains or specific types of mobility such as interdisiciplinary or intersectoral mobility;
- **Monitoring and update of mobility opportunities available**. Calls for proposals or funds for short-term mobility may not be constant in time. Therefore, a monitoring of the calls collected should happen once or twice a year. In such a case, a mobility working group could be envisaged to address this issue, also after the project is finished;
- **Communication strategy** (long-term). Even if mobility opportunities are listed in the Digital Campus and the CIVIS website, it may be possible that this is not greatly used, thus a communication strategy should also take place. Perhaps, an Infoday on the opportunities coming or a note in the newsletter or a short catalogue where the calls are specified. This could also be a task for the Mobility working group. Mediterranean and African partners should be included here.

b) Indicators

1. **Percentage of mobile researchers within CIVIS**. This could give a hint on whether the initiatives put in place are working. An annual or biannual measurement would be helpful.
2. **Number of mobility grants used for short mobility and long-term mobility, including trainers within CIVIS**. This indicator can help to discern whether networking activities are being developed within CIVIS.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

3. **Number of external researchers arriving to CIVIS Universities**. Our aim is to make our universities more attractive, hence, knowing the mobility towards our respective universities could give us an idea of whether the initiatives taken place in CIVIS work.

c) Timing

Mid-/long-terms. The analysis and starting of the Digital Campus may take up some time. The analysis of the opportunities in the Alliance also needs a careful look.

1.2 Use of Erasmus+ STA, funds for short-term mobility, especially with views to set up a train-the-trainer program.

At the same time mobility opportunities are being identified, a common transferable skills training catalogue will be developed. Presumably, courses which evoke a greater interest could be opened to the Alliance or jointly developed to increase recurrence, however this approach is not sustainable for the whole catalogue as it may be unnecessary. Individual interest on dedicated courses should be then considered through a more precise approach, that is, the mobility of trainers. Whether a particular university seeks to integrate courses in-house or provide yearly recurrence in their own official language, a trainers network could be helpful to extend not only the training offer but also the mobility opportunities and the transfer of knowledge in CIVIS. Short-term mobility is also envisaged to address collaborations among the scientific communities.

a) Barriers and roadmap

- **Interest measurement** (mid-term). It would be pertinent to first know the interest of universities in developing a course in particular, then, to decide which trainer would be responsible for teaching that course, how would she/him will acquire the relevant knowledge and for how long would their training be necessary.
- **Not enough awareness of this program** (mid-term). Communication on the possibilities provided by the program should be well targeted.
- **Grants insuffient to cover costs** (mid-term). Sometimes the funds available are not enough to cover the expenses of the costs and therefore this could limit the number of trainers interested in such program. A top-up funding for these cases could be envisaged if this issue arises.
- **Organisation between the universities**. The paperwork linked to this program will be mostly up to the sending universities, however, it would be perhaps ideal to find out a method to ease the process if necessary.
- **Trainings may be specific to a country**, i.e. intellectual property rights copyrights, etc. This will make difficult transfer of knowledge at European level. Points in common must be addressed to see if there is any possibility of exchange trainers.

b) Indicators

1. **Percentage of mobile researchers within CIVIS**. This could give a hint on whether the initiatives put in place are working. An annual or biannual measurement would be helpful.
2. **Number of mobility grants used for short mobility and long-term mobility, including trainers within CIVIS**. This indicator can help to discern whether networking activities are being developed within CIVIS.

c) Timing

Mid-/long-terms. First the transferable skills collected have to be taken into consideration as well as the interest of the universities. Setting up a program may require one-to-one meetings with the interested universities and careful organisation of schedule and paperwork processes.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

1.3 Thematic meetings on mobility opportunities to help identify areas where common development could be valuable, i.e. how to encourage mobility within CIVIS, project proposal development, etc.

The aim of the meetings under the clout of one single domain help to identify the need of discussion around more specialised topics within the field, i.e. Ph.D. mobility, post-docs mobility, intersectoral/interdisciplinary mobility, etc. Follow-up meetings stemming from the main thematic meeting help to not only define a particular framework but also to identify key people at CIVIS universities that could support the development of such domain by taking smaller steps in the particular

a) Barriers and roadmap

- **Measurement of meeting impact** (short-term/long-term). Up to now, just one thematic meeting has taken place. The participants were interested in two follow up meetings with a more targeted content. However, whether the good practices presented are later on implemented or not is yet to be analysed.
- **Difficulties in finding common projects/approach to encourage mobility.** For example creating initiatives together such as infodays or Q&A sessions have been proved useful in the case of MSCA-IF. Perhaps this can be extended to other calls. This helps to raise awareness on mobility opportunities and funding. The costs-benefits of this initiative have to be however well analysed. The thematic meeting on mobility will be useful to found out about this issue.
- **Overlapping of tasks with Horizon Europe Task Force (CIVIS).** Module 4 leader is part of the HEUR TF and would therefore propose the initiatives taken place within the Module to the TF members. It is possible to work on initiatives together.
- **Difficulties to implicate administrative staff from universities.** RIS4CIVIS as a whole may be considered extra work for representatives. A good work plan should be set up in order to avoid high peaks of work.

b) Indicators

1. **Number of follow up meetings organised after the thematic ones.** It could show the interest in one or several topics and the will to implement those in the respective universities.
2. **Number of initiatives to encourage mobility, i.e. infodays.** It would signal evidence of joint working and organisation.

c) Timing

Short-/mid-terms. The thematic meetings are already on-going. The meetings however will be extended throughout the project.

1.4. Studying a possible MSCA Sttaff Exchanges or Doctoral Networks. Information sessions for the future 2023 Work Programme looking at Hubs (Specialisation) and Mediterranean partners. However, this action must be discussed later on and depends on the development of the short-term initiatives and the interest of partners in collaborating to encourage the achievement of these funds. **COST Actions** may also be studied. Furthermore, other projects similar to CIVIS3i could be contemplated, this however, must be discussed within the Horizon Europe Task Force. It is worth mentioning that the partners of RIS4CIVIS are contributing with their National PC Representatives to the preparation of the MLSCA WP 2023-2024 of HEUR to define a CSA that could be crucial for the Alliances to implement further integrative projects for the Alliance.

a) Barriers and roadmap

- **Common strategy to enhance joint project submission.** Infodays and other types of initiatives as trainings and Q&A sessions have been proven useful. Universities may agree to push forward these for certain European calls that require further collaboration among the universities. So far

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

only MSCA-Post-Docs has been targeted through the HEUR TF.

- **Collaboration with several other Task Forces and Module 1.** The on-going work of certain TF may overlap some of the work done by Module 4, thus, the Module leader will be in direct contact with the representatives at her university to follow up on this work. The work of the TF Doctorate, Fundraising and HEUR are of interest for the Module.
- **Establishment of collaboration links between the universities.** If the CIVIS Alliance intends to encourage the submission of mobility projects perhaps further efforts must be made to establish collaborations between the universities. The Cups&Cakes initiative, the CIVIS Call for projects for Supporting workshop plus the trainings and possible infodays could support the development of links between the universities. A collaboration board could be made available as well through the CIVIS website or digital campus.
- **Degree of interest in developing such projects.** Universities may already have these types of initiatives in place. A costs-benefits analysis should be done before starting any initiative that could be just considered burdensome.
- **Joint organisation and monitoring of the project.** As for the organisation of joint project such as CIVIS3i and such, these have to be looked at in the long-term to not overlap too many projects at the same time. The greater obstacles lies in the organisation of said projects.

b) Indicators

1. **Percentage of mobile researchers within CIVIS**. This could give a hint on whether the initiatives put in place are working. An annual or biannual measurement would be helpful.
2. **Number of external researchers arriving at CIVIS universities.** Our aim is to make our universities more attractive, hence, knowing the mobility towards our respective universities could give us an idea of whether the initiatives taken place in CIVIS work.
3. **Number of initiatives to encourage mobility, i.e. infodays**. It would signal evidence of joint working and organisation.
4. **Number of project proposals submitted with at least 3 CIVIS partners.** This could mean that collaborations are better organised and more productive and that the research environment within CIVIS will be improved by other projects arising from it.

c) Timing

Long-term. The Universities may need to do a need analysis first and prioritize in case the initiative goes forward.

2. Training and career development

2.1 Training

The fields of training and career development, equally to mobility, did not have big national or legal barriers to sort out, hence, collaboration among CIVIS universities could be easily envisaged. Nonetheless, career development programs are not as developed as the training offer in many universities due to a lack of a centralised research strategy but mostly due to lack of resources, whether financial and/or human. In this context, it should be noted that two approaches will be taken for the different fields: transfer of knowledge for career development schemes and course compilation, sharing and development to enhance the training offer.

The set-up of the training catalogue will be divided into several phases:

1. Identification of transferable skills courses in all languages of the Alliance;
2. Classification of courses by field/domains;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

3. Opening of English courses and planning of communication strategy (catalogue);
4. Analysis of global and individual gaps;
5. Study the possibility of joint organisation of training;
6. Mobility of trainers to support in-house training at CIVIS universities;
7. Setting up and adapted platform for the Digital Campus.

Further collaboration with other Modules, especially Modules 3, 5 and 6 is expected in regards to the set up of further trainings development at European level.

a) Barriers and roadmap to build a common catalogue

- **Universities may not have the complete training courses available for the next academic year**. Even this has been proven wrong, it is worth noting that dates are not yet confirmed in many cases. A living platform where trainings could be included on permanent basis has been therefore put in place. The questionnaire to collect this trainings has also been kept open;
- **Courses without a date and means to monitor the organisation.** For the moment, Universities are opening courses at their own will. If in the future other trainings are decided to be open but no dates are available it may be possible to set up some reminder mechanism through which interested researchers could register. However, these courses may not be targeted first;
- **Valid means to collect individual and collective interest.** The organisation of joint trainings has to be based on common interest, how will the interest be collected is something to be discussed further. In the meantime, after collecting the trainings, the database will be shared among the experts of CIVIS universities. The experts will be asked to not only analyse the trainings, but to also express their interest, select trainings to share in the future and to propose other innovative trainings that could be tested within the Alliance;
- **Gaps at global and individual level.** The recognition of gaps can be difficult if these are happening at global level, however, the experts at the universities may have an idea of the trends and possible trainings that are not represented in the transferable skills database. At individual level, the recognition of gaps can be done by comparing the trainings courses offered at the other universities. The interest in developing in house training enters here. The program train-the-trainers could be actually a case study possibility for Module 4 after having measured individual interests;
- **Lack of expertise in one/several gap domains for the Alliance.** If gaps at global level appear, the question on where and how to get the necessary expertise remains. Addressing the global gaps are however not a priority as for now it seems all universities have a great number of transferable skills trainings.
- **Funding for joint training** (long-term). If joint training is organised, looking for expertise and other resources may require some additional funding.
- **Funding for individual training** (mid-term/long-term). If Universities decide to open courses for the Alliance it would be necessary to analyse whether funding is necessary since many courses count with trainers external to the universities.
- **Timeframe and available tools**. The schedule is constrained as dates are difficult to gather in advance, therefore it hampers the launch of the catalogue too, although its release should be set for the beginning of the academic year, that is September 2022. Arguably, at least the courses open this year may be open the next, however, this remains unknown as it depends on the experience of each university. The availability of tools and resources is also a difficulty to be addressed. The means to organise and follow up a training course may be difficult depending on the course. The CIVIS Alliance could support this, but the best way to do so is still in discussion.
- **Courses tailored to the university which organises it**. Some part of the content of the training may not be relevant for the other universities (e.g. specific national rules, dedicated

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

support/offices/ressources available only in one university, mode of organisation etc.).

- **Timing of the development of the CIVIS Digital Campus** and resources needed to update the catalogue.

b) Indicators

1. **Transferable Skills catalogue available for all CIVIS**. The release of the catalogue for the next academic course is a milestone. The below indicators would give information on its actual use by the universities.
2. **Number of courses individually opened within the Alliance.** It shows the good will of universities as well as their interest in extending the offer for their own scientific community.
3. **Number of courses organised as an Alliance.** Shows the Alliance can work and be useful while maximising training recurrence and providing solutions for its gap at global level.
4. **Number of courses individually offered within the respective universities**. The indicator shows that the train-the-trainer program works and that inspiration to open new courses in-house is working.
5. **Number of trainers/researchers mobilised in the Alliance for training purposes.** This number addresses not only the train-the-trainer program but also the interest of researchers in following up training programs at the other universities (perhaps to divide in two indicators?).

c) Timing

Course compilation and course openings in the short-term, Up to a running catalogue in the mid/long-terms, and organisation of courses as an Alliance and therefore at European level in the long-term. This timing is also dependant on the development of the CIVIS Digital Campus and the resources avalaible to create and maintain the catalogue.

2.2 Career Development

In terms of career development transfer of knowledge is key. The desired end-points for this domain lie in:

1. Standarised strategies/practices on career development (tbd if the Module focus on Ph.D., post-docs, academics, etc.);
2. Raise awareness of the importance of career monitoring, supervision and mentoring;
3. Running working group/hub/platform on career development that could touch upon 3i mobility and training (i.e., CIVIS3i).

These initiatives aim to clear the path in the field, reflect on researchers needs and improve the HRS4R in all CIVIS Universities. The possibilities of carrying out such initiative are varied and must be discussed in the future with the representatives from the other relevant Modules. In fact, this could be a pilot case study in which a strategy comprising both career development and training dedicated for the fellows hired under the CIVIS3i program could be envisaged. A meeting for career development is set for the 15th March.

a) Barriers and roadmap

- **Agreement on common practices**. Standarisation would be difficult since the organisation of the universities is different as well as the contract of researchers. Perhaps Ph.D. and post-docs could be targeted instead of academics since their contracts are more unstable. Training and coaching sessions could be dedicated to them. This can be put into test through a case study with the post-docs hired through the CIVIS3i project. The thematic meeting dedicated to career development could enlighten the objectives more precisely;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

- **Funding** may be necessary to produce dedicated training or coaching sessions;
- **Difficulties to implicate administrative staff from universities.** RIS4CIVIS as a whole may be considered extra work for representatives. A good work plan should be set up in order to avoid high peaks of work;
- **Timing and organisation** not only with the other Modules but with the domains of Module 4 and their corresponding thematic meetings as career development comprises mobility and training as well. The Module representatives will have to prioritise on the relevant initiative to take place.

b) Indicators

1. **Platform/ library on career development available (i.e. for CIVIS3i post-docs).** It will show the actual implementation of career development practices agreed at European level, plus will be a test for some universities which do not have active inititiaves in the field.
2. **Number of mentorship programs within the Alliance.** The thematic meeting could serve as an inspiration for some universities to put in place a mentorship program.
3. **Number of career tools used in each CIVIS university.** If there is an increment of these tools, the impact of the Module would be more visible.
4. **Number of tandems meetings to address a specific strategy or tool.** It quantifies the interest of the universities.

c) Timing

Mid-/Long-terms. The collaborations with CIVIS3i must be set up if there is an agreement over this initiatives. The needs of the researchers hired or to be hired must be taken in consideration as well as the training to be provided to them. The partners involved would have to agree on how to organise it.

3. Working Conditions

Working conditions are subject to many limitations due to national legislation, regulations of the universities themselves and sometimes even faculties due to decentralisation. It would be worthy, however, to address the domains in which change is not so much dependent on law and rights, but on the will of the universities and their policy strategies, i.e. gender, career development, training, research incentives, etc. In this context, it is possible to find those domains in HR strategy for researchers (HRS4R) which in general deems to set up good working conditions for researchers. Therefore, the main objective of addressing the different domains of Module 4 is to reinforce these strategies in all CIVIS universities, facilitating in this way the obtention/renewal of the HR Excellence Award, for which another thematic meeting will take place on the 13th October.

1. HRS4R and HR Excellence Award – 13th October (Done)
2. Training meeting – Pending
3. Mobility and research incentives – 17th January
4. Gender and Diversity meeting – 15th February
5. Mentorship and career development tools meeting – 15th March
6. Environmental sustainability meeting - Pending
7. Welcome practices – Pending
8. Valorisation of research – Pending

One action will take place in the short-term, the **collection of research incentives**, whether financial or from HR at regional and institutional levels. It may provide information on:

- Possible gaps within the Alliance and on individual basis that could be perhaps covered by CIVIS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

(i.e. Module 5 would be interested in developing a recognition & reward scheme for Open Science for example),
- Ideas to be developed on individual basis based on incentives at other universities,
- Publication of incentives could be difficult as they may change, but to be discussed.

a) Barriers and roadmap

- **Different organisation systems** not only at university level but also at national level may hamper a greater harmonisation of the working conditions of researchers. That is the reason why transfer of knowledge on practices should be firstly addressed. Universities could afterwards chose among those practices/ideas/initiatives that better fit the organisation of their university;
- **Difficulties in standarising practices.** Some domains are not developed at the same level in all universities as is the case of career development, thus a standardising process can only be based on recommendations. Its real application will be therefore up for the universities themselves;
- **Institutional strategies differ and compromise degree within the initiatives.** The priorities for the universities are very different, finding a common space may be difficult. Further conversations within the universities are necessary to decide upon the next steps;
- **Monitoring impact. The results of the RIS4CIVIS project** must be clear and measurable, the number of initiatives happening at the same time may be a burden, therefore special working groups could be envisaged depending on the domain. Priorities will also be taken into consideration.

b) Indicators

1. **Number of universities with the HR Excellence Award.** Indicates good implementation of the HRS4R.
2. **Number of universities with an action plan for HRS4R, i.e training and career development for researchers.** Indicates the compromise of the universities to improve the research environment, facilitates access to EU funding and shows the transfer of knowledge meeting work.
3. **Number of universities with a Gender Equality Plan.** It shows the dedication of the universities to improve the working environment and the working conditions of female researchers.
4. **Number of universities with balanced numbers of female and male researchers.** The indicator helps to identify whether more work should be done in certain areas of the universities, i.e. STEM domains.
5. **Number of universities with a Sustainable Development Plan.** This number will also provide evidence on the working environment surrounfing research and will help to comply with the Horizon Europe goals on sustainability.

c) Timing

Mid-/long-terms. The thematic meetings have already begun but there is still a long way to implement all the necessary processes described above.

4. Recruitment

The field of recruitment is also constrained by national law and universities regulations. The number of actions to be pursued together is then somehow limited. However, new ideas and initiatives can originate from the thematic meetings that will take place in the Module. Some of the objectives identified have to do with the HR Excellence Award in particular, as mentioned above, and with the HRS4R in general.

Several actions have been discussed:

1. **Transfer of knowledge to obtain the HR Excellence Award**. Indeed, sharing our different ways

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

of achieving the HR Excellence Award and the action plans designed to improve the strategy can serve as a guide for those universities willing to apply. A meeting will take place next 13th October.

2. **Branding job opportunities with the Alliance logo in Euraxess**. In this regard, the Module leader contacted the Euraxess management and for the moment no branding is possible, although in the future and for the revamping of the website the management team will have the Alliances in consideration. Since this is not possible, universities can agree to share their Euraxess job opportunities link in the CIVIS webiste.
3. **Training for staff on recruitment practices**, i.e. anti-discrimination, gender-bias. For the moment the Module will focus on pushing forward the transferable skills catalogue. The collection of this training will not be discarded for the future if there is a demand and representatives agree on it.
4. **Announcement board for research projects collaboration/submission.** Until now, CIVIS relied on sharing this kind of search through mailing lists. This initative would depend on the Digital Campus and the degree of awareness within the different universities.

a) Barriers and roadmap

- **Different organisation systems** not only at university level but also at national level may hamper a greater harmonisation of the working conditions of researchers. That is the reason why transfer of knowledge on practices should be firstly addressed. Universities could afterwards chose among those practices/ideas/initiatives that better fit the organisation of their university.
- **Difficulties in standarising practices.** Some domains are not developed at the same level in all universities as is the case of career development, thus a standardising process can only be based on recommendations. Its real application will be therefore up for the universities themselves.
- **Institutional strategies differ and compromise degree within the initiatives.** The priorities for the universities are very different, finding a common space may be difficult. Further conversations within the universities are necessary to decide upon the next steps.
- **Monitoring impact. The results of the RIS4CIVIS project** must be clear and measurable, the number of initiatives happening at the same time may be a burden, therefore special working groups could be envisaged depending on the domain. Priorities will also be taken into consideration.

b) Indicators

1. **Number of universities with the HR Excellence Award.** Indicates good implementation of the HRS4R.
2. **Number of universities with an action plan for HRS4R, i.e training and career development for researchers.** Indicates the compromise of the universities to improve the research environment, facilitates access to EU funding and shows the transfer of knowledge meeting work.
3. **Number of CIVIS collaboration projects.** If the number of collaborative projects arise it means recruitment of post-docs/Ph.D. is also increasing.
4. **Number of trainings dedicated for HR.** Trainings dedicated to HR represent the will of universities to address recruitment better.

c) Timing

Mid-/long-terms.

The following table illustrates the desired end-points selected as well as their preliminary roadmap elaborated, including rationale, actions and preliminary list of indicators.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Table 4 – Module 4: Desired End-points & Preliminary Roadmap

International, intersectoral and interdisciplinary mobility end-points	Rationale	Actions	Indicators
1. Collection of universities opportunities for outgoing and incoming researchers and development of a train the trainer program	• Encourage mobility between CIVIS scientific communities and support internationalisation • Raise awareness on mobility benefits, that is, networking, transfer of knowledge, funding possibilities, etc. • Provide an extended offer of mobility opportunities • Render CIVIS universities and the Alliance itself as an attractive environment to develop research • Transfer of knowledge between universities in the mobility field	1. Launch of call for proposal for networking activites for researchers 2. Collection of mobility opportunities for researchers (short-term) 3. Compilation of mobility opportunities available in the Digital Campus/website plus private opportunities for fellowships and other types of mobility (medium term) 4. Study **MSCA RISE** proposal and other actions such as Action **COST** and **Erasmus+ for PhD** (long-term) 5. Train the trainer program linked with training (medium/long-term) based on **Erasmus +STA** or MSCA (long-term)	Percentage of mobile researchers within CIVIS
2. Encourage collaboration and development of European mobility programs within CIVIS, i.e. MSCA, cost Actions, CIVIS3i, Erasmus+ STA,			Number of project proposals submitted with at least 3 CIVIS partners through the HEUR program
3. Awareness raising on the value of mobility			Number of mobility grants used for short mobility and long-term mobility, including trainers
4. Increase the number of tools available for researchers to travel, i.e. flexibility, welcome packages, contracts, incentives, etc. (HRS4R)			Number of external researchers arriving at CIVIS universities
5. Advocate reduction of bureocracy, internationalisation of administrative support, centralisation of certain services (support for research departments)			Number of follow up meetings organised after the thematic ones
			Number of initiatives to encourage mobility, i.e. infodays

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Training end-points	Rationale	Actions	Indicators
1. Up and running transferable skills program/catalogue for the different research stages, also contributing to the CIVIS3i post-docs' individual training plan	• Extend the training offer of all the CIVIS universities • Address possible gaps within the Alliance and also within each individual university • Competences and knowledge sharing • Produce a comprenhensive catalogue for the CIVIS3i post-docs • Provide support to close gaps in an individual manner for universities that intend to acquire competences to organise trainings on certain topics • Share know-how • Develop material together helps to support different departments • Improve the working conditions of the researchers in terms of career opportunities	1. Collection of transferable skills training (short-term) 2. Make available open courses (short-term) 3. Study gaps and competences (medium-term) 4. In-house development and alliance created courses (long-term) 5. Running program (long-term) 6. Funding for training development (EU, Alliance calls) 7. Meeting on training: 10th December	Transferable Skills catalogue available for all CIVIS
			% participation of each university in the courses commonly developed as an Alliance once a monitoring system is established
2. Knowledge of individual gaps at individual and alliance level			Number of courses individually opened within the Alliance
3. Knowledge of competences available within the Alliance			Number of courses organised as an Alliance
4. Extended offer of training on transferable skills for all CIVIS universities			Number of courses individually offered within the respective universities
5. Replication of this initiative for administrative staff			Number of trainers mobilised in the Alliance

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Career development end-points	Rationale	Actions	Indicators
1. Standarised strategies/practices on career development (tbd if the Module focus on Ph.D. candidates, post-docs, academics, etc.)	• Level up the strategies at all universities. • Share knowledge and know-how on mentorship programs, supervision strategies, etc • Extend the tools for career follow-up • Reflection on researchers' needs to access academic and non-academic fields • Increase the level of interest in developing individual plans for career development • Improved HRS4R	1. Collection material (short-term) 2. Set up of library (short-term) 3. Standardisation of tools and programs for career development (medium-term) 4. In-house development of tools (long-term) 5. Running tandems/working groups/hub for improving career development (long-term) 6. Funding for training/career development (EU, Alliance calls) 7. Career development tools meeting – 15th March	Platform/ library on career development available
2. Raise awareness of the importance of career monitoring, supervision and mentoring			Number of mentorship programs within the Alliance
3. Running working group/hub/platform on career development that could touch upon 3i mobility and training.			Number of career tools used in each CIVIS university Number of tandems meetings to address a specific strategy or tool

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Working Conditions end-points	Rationale	Actions	Indicators
1. HRS4R present in all CIVIS universities	• Having an HRS4R and the HR Award to attract researchers and better position universities to acquire EU funding • The HRS4R emphasizes the Alliance compromise with the well-being of researchers • The HRS4R addresses practical needs of researchers and administrative staff in charge of research, i.e. welcome practices, training, incentives etc. • All universities in Europe must have a Gender Equality Plan to apply for EU funding. Transfer of knowledge is key.	1. Transfer of knowledge on working conditions, i.e gender, welcome practices (short-term) 2. Collection of incentives for transfer of knowledge 3. Setting up extended training and mobility programs for researchers (medium/long-term) 4. Address status of researchers in the RIS4CIVIS event at Brussels in March 2022 (tbd) 5. HRS4R and HR Excellence Award meeting - 11th October+ more specific upcoming meeting in November 6. Gender and diversity meeting – 15th February	Number of universities with the HR Excellence Award
2. HR Excellence Award achieved by all universities			Number of universities with an action plan for HRS4R, i.e training and career development for researchers
3. Transfer of knowledge on welcoming practices (tbd) gender equality and sustainable development			Number of universities with a Gender Equality Plan
4. Raise awareness of gender and diversity issues as well as sustainable development in the field of research			Number of universities with balanced numbers of female and male researchers
5. Advocate for a researcher status within the EU (tbd)			Number of universities with a Sustainable Development Plan

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Recruitment end-points	Rationale	Actions	Indicators
1. HRS4R present in all CIVIS universities	• Having an HRS4R and the HR Award attracts researchers and better position universities to acquire EU funding • The HRS4R emphasizes the Alliance comprise with the well-being of researchers • Collaboration between universities could give way to enhance the recruitment of researchers and funds acquisition • Having also a transfer of knowledge on welcome practices could also help to understand how universities address integration and other relevant services for newly recruited staff	1. Transfer of knowledge regarding recruitment and best practices from CIVIS3i calls (two rounds, one is in progress) 2. Set up the corresponding EURAXESS job opportunities link per university in CIVIS website 3. Platform to publish collaboration for EU project proposals, supervisors database, job opportunities (long-term) links with Module 1 and TF HEUR 4. Meeting on HRS4R and HR Excellence Award – 13th October 5. Gender and diversity meeting – 15th February	Number of Universities with the HR Excellence Award
2. HR Excellence Award achieved by all universities			Number of universities with an action plan for HRS4R i.e training and career development for researchers
3. Platform/announcement board to push forward research groups collaborations			Number of collaborative EU projects within CIVIS
4. Make job opportunities visible through the Alliance (tbd)			Number of trainings dedicated for personnel involved in recruitment committees
5. Training for staff on recruitment practices (tbd)			
6. Welcome practices transfer of knowledge (tbd)			

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Module 5: Mainstreaming of Open Science

Module 5 focus on implementing the strategy that is agreed upon, and will complement it by addressing the tension between Open Science and IPR and other issues that may emerge subsequent to the establishment of the Open Science Policy Platform (OSPP).

Therefore, Module 5 objectives are:

- To complete the work achieved on Open Science with an IPR perspective;
- To develop relevant systems and procedures to support Open Science within CIVIS Alliance members;
- To provide practical support to researchers to implement Open Science including through for example trainings, and guidelines.

Methodology & Procedure applied to data collection

The key objective of Module 5 within the RIS4CIVIS project is to implement a common CIVIS approach to Open Science (OS). It builds on the activities of the CIVIS OS TF developed in 2020, including early surveys of OS practices and policies in CIVIS universities. Prior work on OS topics comprises the following documents:

- An early survey of OS policies and practices (January-March 2020);
- A second survey form (March 2020);
- The CIVIS Open Science Strategy (September 2020);
- The CIVIS Open Science Statement (Dec. 2020-January 2021; later approved in the steering committee in March 2021);
- The Report for the Benchmarking phase of the RIS4CIVIS (June 2021), which covers the work being done in the first 6 months of the project (WP1);
- Report 1 in WP2 (Desired End-points).

During the Benchmarking phase (WP1) of the RIS4CIVIS project, Module 5 has conducted a survey, based on a questionnaire developed by LERU, with 83 questions, which maps the following OS categories: Cultural Change; Future of Scholarly Communication; FAIR Data and RDM; EOSC; Education & Skills; Recognition & Rewards, Next Generation Metrics; Research Integrity; Citizen Science, Open Education.

In WP2, the work of the Module was carried mostly asynchronously (July-September). Module 5 members started from the results of the Benchmarking phase, which were analysed according to the questions/ tasks of the WP2. Thus, they collected comments and suggestions on each OS category included in the Benchmark report. The process was carried out with online tools (a shared folder in the cloud, emails, an online form to collect comments) and it was concluded with a meeting in September. The meeting of 24th September was intended to establish consensus upon the OS categories to focus on the timeframe of the RIS4CIVIS, in general, and WP2, in particular. They decided to prioritize the work on the following categories from the above: Cultural Change; Future of Scholarly Communication; Research Data Management; Education & Skills; Recognition and Rewards & Next Generation Metrics; Research Integrity. Other categories are left to be developed later (EOSC), in collaboration with other Modules (M6: Citizen Science) or as part of the TF OS in CIVIS (Open Education Resources). Several shorter versions of the working documents were produced in order to facilitate the completion of

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Tasks 2.1.a. Identify the desired, long-term end-point for each Module, Task 2.1.b. Analyse the barriers to the achievement of the long-term goal, and Task. 2.2. Develop Roadmaps of the WP2.

Results: Module 5 - Desired End-points & Preliminary Roadmap

As stated in the name of Module 5, the main goal of the Module is to mainstream Open Science (OS) in CIVIS. This is reflected in the list of desired End-points, which made the object of the previous report in WP2 (see the table bellow). Module 5 team identified the following desired end-points, corresponding to diverse Open Science categories (listed in front of each end-point, in bold):

1. **Cultural change – common OS Strategy.** All the CIVIS universities have an OS policy: a common framework for OS policy for all the participant Universities and each university will develop an OS strategy.
2. **Cultural change – common OS Support Service.** One common OS Service, supported by OS coordination groups in each university of the Alliance. Each OS group will have an academic OS leader, to foster OS actions within the CIVIS universities.
3. **Future of scholarly communication.** Make publications open by default and provide a gateway to all CIVIS research outcomes (e.g., local repositories harvested by OpenAIRE). Encourage the transformation of institutional presses into open access publishing houses (monographs and journals).
4. **Research Data Management - Repository.** Mapping institutional repositories managing Research Data according to FAIR principles.
5. **Research Data Management - Training.** CIVIS training programs on RDM.
6. **Education and Skills – Common Practices.** Creation of a common knowledge base on OS and raising awareness about open science practices.
7. **Education and Skills - Training.** Creation of common courses to develop OS skills.
8. **Recognition and Rewards & Next Generation Metrics - Award.** Establish an award for CIVIS Best Practices in OS.
9. **Recognition and Rewards & Next Generation Metrics - Indicators.** Common table of indicators to measure research activity and scientific production, from the OS perspective. CIVIS universities include OS practices in their research evaluation and career assessment processes (link this to the HRS4R in Module 4).
10. **Recognition and Rewards & Next Generation Metrics – Development of Metrics.** Participation in international activities for the development of New Generation Metrics that take into account the whole research lifecycle and all the types of research outputs (e.g:, DORA).
11. **Research Integrity.** Raise the awareness of the CIVIS community on all aspects related to Research Integrity, including the use of Open research practices (ethics included). RRI training for all PhDs and researchers.

The list reflects the ambition of the CIVIS alliance to take action in promoting and implementing OS practices. The desired end-points can be subsumed to two general goals: (1) raising awareness about OS practices; (2) enhance the collaboration between universities within CIVIS. Two types of actions are foreseen: trainings and recognition of OS practices through the implementation of the CIVIS OS Award.

The priority is to contribute towards the OS category of **Cultural Change** and to make all the relevant actors aware of the wide scope of the OS landscape (points 1 and 2 in the list). For this reason, we aim

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

to transfer the best OS practices to all CVIS universities and to learn from successful implementations of OS projects. A series of networking activities (e.g., workshops, webinars, trainings, summer schools etc.) – organized together with the OS TF in CIVIS – are foreseen in the framework of the RIS4CIVIS project. Collecting the expertise of our colleagues is essential to act upon the first two end-points. This will contribute to the elaboration of a common framework for OS policy and will help each university to develop an OS strategy or to consolidate the existing ones. A common effort will strengthen and/ or will contribute to the creation of OS working groups at institutional level. These are important actions, and they might take long time for implementation – e.g., putting them into practice depends on national legislation, institutional policies and strategies – and it is difficult to assess the required timeframe. However, the suggested indicators will map the existence of OS policies and OS structures in our universities, so they will reflect the degree of implementing OS in all CIVIS universities.

For **Future of scholarly communication** category, we aim to focus on training and guidance for our researchers into Open Access practices (point 3 in the list). We have the ambitious goal to make all research results open by default, which can be achieved through a common strategy and training. Acting towards this goal might require a very long timeframe, but it can be assessed by the existence of CIVIS/ institutional guidelines on OA publications and the percentage of academic publications in open access.

One of the emerging areas of OS landscape is the category of **Research Data Management (RDM)** – points 4 and 5 in the list. Our Module aims to chart the existing institutional repositories and to create a CIVIS training program on RDM. As in other cases which involve training, the envisaged approach is to first develop train-the-trainers programs. Implementing a training program is possible on the mid- (to long-)term period, and the success can be measured by the existence of a common catalogue of institutional repositories and the existence of a common training program.

The OS category of **Education and Skills** is seen as a perfect development in the upcoming phase (mid-term, Case Study), and it consists in raising awareness about OS within our academic community and the creation of common courses to improve OS skills (points 6 and 7 in the list). It is a broad program grounded on the best OS practices recognised at the European level, which are aimed to support our activities for the **Cultural Change**, too. Offering introductory courses and workshops on OS practices, combined with applied trainings on particular techniques, practices, and OS skills will contribute to the development of OS in CIVIS. The indicators consist in the mapping of the existence of such training programs. The training program can be developed jointly with Module 4 as part of the career development actions for researchers in the CIVIS universities.

The recognition of good OS practices – see the **Recognition and Rewards & Next Generation Metrics** category (points 8-10 in the list) – will be done through the implementation of the CIVIS OS Award. This will raise the visibility of OS within the alliance. At the same time, it will contribute to the ongoing discussions at European level about implementing new forms of research assessment that take OS practices into consideration. For this reason, experts in our Module and the experts of OS groups in our institutions will participate in international activities for the development of Next Generation Metrics. We plan to promote a pilot case study, jointly with Module 4 (in the framework of the HRS4R award), where new indicators will be tested. Depending on the allocation of resources and the consensus on the OS award, this collaborative action can be done on mid- to long-term; with the added note that continuous involvement in supporting OS practices is needed (i.e., OS award announced each year).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Another important OS category included in our list of desired end-points is **Research Integrity** (point 11 in the list). We take it as an overarching activity, promoting collaboration between OS practices and the activities of ethics and academic integrity offices in CIVIS. It is at the same time an activity meant to raise the awareness and to promote trainings within the alliance. We start from the already existing guidelines and recommendations at European level, which we plan to adapt as trainings within CIVIS. This is expected to be achieved within the timeframe of the RIS4CIVIS project, but involving more colleagues might require more time, as this type of action requires an organic growth of the training program. In any case, the indicator is the existence of training Modules in the broader issues of OS and research integrity.

In brief, the foreseen actions toward the implementation of the desired end-points defined in Module 5 are of two types: to raise the awareness about OS practices in CIVIS and to enhance collaboration between all CIVIS universities. The CIVIS OS Award is expected to increase the visibility of a wide-range of OS results and, at the same time, to give more weight to OS solutions in the recognition of research outcomes. Federating existing OS resources is another important course of action, which will be supplemented by common training programs and shared guidelines in OS practices.

In brief, the foreseen actions toward the implementation of the desired end-points defined in Module 5 are of two types: to raise the awareness about OS practices in CIVIS and to enhance collaboration between all CIVIS universities. The CIVIS OS Award is expected to increase the visibility of a wide-range of OS results and, at the same time, to give more weight to OS solutions in the recognition of research outcomes. Federating existing OS resources is another important course of action, which will be supplemented by common training programs and shared guidelines in OS practices.

The following table illustrates the desired end-points and their related motives, actions, time, barriers/risks and indicators, which compose the Module 5 Roadmap.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Desired End-point	Actions to be developed to achieve it	When to achieve it?	Barriers/ Risks	Indicators to measure the effectiveness of the actions
(Cultural change). All the CIVIS universities have an OS policy: a common framework for OS policy for all the participant Universities and each university will develop an OS strategy.	Transfer of best practices from the universities with an OS policy to universities currently developing one. Organise workshops, webinars, trainings. Create a network of experts.	Long-term	Not all countries have a national OS policy, which might delay the adoption of institutional OS policies.	Existence of an OS policy (institutional). (in absence of an institutional OS policy) Existence of OA policy and Existence of open data policy.
(Cultural change). One common OS Service, supported by OS coordination groups in each university of the Alliance. Each OS coordination group will have an academic OS leader, to foster OS actions within the CIVIS universities.	Create the CIVIS network of OS experts (linked with the above). Create a Virtual Contact Point - Single Contact Point for CIVIS OS. Establish a dedicated OS coordination group (structure/ unit) in each CIVIS university. Nominate an academic OS leader (per institution).	Mid-term (Case Study phase/ end of RIS4CIVIS)	Some of the actions might be postponed, depending on the adoption of the OS policy. Lack of awareness about the entire OS spectrum.	Existence of a dedicated person responsible for promoting and supporting OS practices (OS academic leader). Existence of an OS working group for supporting OS practices. Existence of a virtual space dedicated to OS.
(Future of scholarly communication). Make publications open by default and provide a gateway to all CIVIS research outcomes (e.g., local repositories harvested by OpenAIRE). Encourage the	Provide trainings on OA and publication models. Develop/ adopt guidelines regarding OA. Organise webinars, workshops, trainings to raise the awareness of the academic community about OA publications and to encourage university presses to publish in OA.	Long-term	All actions require a long timeframe.	Existence of institutional guidelines for all researchers regarding open access and data management policies/ existence of a service for OA publications. Existence of training Modules for young researchers as well as senior researchers on open

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

transformation of institutional presses into open access publishing houses (monographs and journals).				access and open data management policies. % of academic publications published in open access (journal articles, monographs, datasets, code, etc.)
(Research Data Management). Mapping institutional repositories managing Research Data according to FAIR principles.	Map the existing institutional data repositories.	Mid-term to Long-term	Fragmentation of resources.	Existence of a list with institutional data repositories.
(Research Data Management). CIVIS training programs on RDM.	Create a common training program in RDM.	Mid-term (Case Study phase/ end of RIS4CIVIS)	Already existing resources at European level (the risk of duplicating the effort).	Existence of a common training program in research data management.
(Education and Skills). Creation of a common knowledge base on OS and raising awareness about open science practices.	Create a common knowledge base, including documentation and links to OS resources (e.g., webinars).	Mid-term (Case Study phase/ end of RIS4CIVIS)	Different development of OS practices in CIVIS universities might require a variety of actions.	Existence of a common knowledge base to introduce researchers and academics into the multiple dimensions of OS. The existence of activities (trainings, sharing good practices, networking) to consolidate and reinforce the common knowledge base.
(Education and Skills). Creation of common	Create a common training program. Adopt existing training programmes and activities, such as FOSTER toolkit (https://www.fosteropenscience.eu/), which has	Mid-term (Case Study phase/ end of RIS4CIVIS)	Already existing resources at European level (the	Existence of a common training program.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

courses to develop OS skills.	been developed by EU and is applied by several European research institutions.		risk of duplicating the effort).	
(Recognition and Rewards & Next Generation Metrics). Establish an award for CIVIS Best Practices in OS.	Map the OS practices in CIVIS and establish the OS award.	Mid-term (Case Study phase/ end of RIS4CIVIS)	A CIVIS consensus is needed.	Existence of an "Open Science Award" (or similar) at HEI level
(Recognition and Rewards & Next Generation Metrics). Common table of indicators to measure research activity and scientific production, from the OS perspective. CIVIS universities include OS practices in their research evaluation and career assessment processes (link this to the HRS4R in Module 4).	Elaborate a common table of OS activity indicators for research assessment. Promote a pilot case study to use the new indicators.	Long-term	A CIVIS consensus is needed. Agreement and involvement of relevant/ competent academic authorities are required.	Existence of recommendations for the use of innovative indicator-based approaches to assess "openness" or social impact in researcher performance reviews. Recommendation on the inclusion of criteria regarding OS approaches in selection processes for researchers at all levels.
(Recognition and Rewards & Next Generation Metrics). Participation in international activities for the development of New Generation Metrics that take into account the whole research lifecycle and all the types of	Establish a list of international activities/ groups working on New Generation Metrics. Participate in other OS initiatives at international level.	Mid-term to Long-term	The allocation of resources (time and expertise).	Members of CIVIS participating in events related to the development of New Generation Metrics.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

research outputs (e.g., DORA).				
(Research Integrity). Raise the awareness of the CIVIS community on all aspects related to Research Integrity, including the use of Open research practices (ethics included). RRI training for all PhDs and researchers.	Organise webinars, workshops, trainings to raise the awareness of the academic community about OS. Collaborate with ethics and academic integrity committees in all CIVIS universities. Adopt/customize (existing relevant) initiatives and recommendations. For instance LERU (League of European Research Universities, https://www.leru.org/), has developed a set of recommendations for the implementation of research integrity culture in Universities (https://www.leru.org/publications/towards-a-research-integrity-culture-at-universities-from-recommendations-to-implementation, January 2020). Moreover COPE (Committee on Publication Ethics, https://publicationethics.org/), has published Core Practices for all the stakeholders involved in the publication of research results (https://publicationethics.org/guidance/Guidelines, 2017).	Mid-term (Case Study phase/ end of RIS4CIVIS)	Low participation rate. More time needed.	Existence of training Modules for young researchers as well as senior researchers on the broad issues of OS and research integrity.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Module 6 – Embedding Citizens and Society

The focus of Module 6 is to increase public participation in science, public perception of the relevance of science, and public acceptance of science, across all of the CIVIS local communities.

Our objectives are to develop and share common tools, practices, concepts, policies and trainings that open research to citizens and society, increasing the quality and efficacy of these three basic aspects:

- **Science Communication (SC)**
- **Citizen science (CS)**
- **Open Innovation (OI)**, social innovations, and challenge-driven innovations

Methodology & Procedure applied to data collection

For the development of Consensus Building Phase, Module 6 has chosen to apply a similar methodology employed during Benchmark phase (WP1).

A first suggestion on objectives, methodological approaches, desired end-points and their respective roadmap have been shared and discussed among Module 6 representatives in order to find a consensus and then a final version end-points and roadmap contents. These discussions took place during virtual meetings held on **7th July** and **28th September, 10th November and 14th December**. Furthermore, the communication among Module 6 leader and representatives has also been made by email.

Up to now different documents have been produced:

- 4 versions of desired end-points,
- 2 Roadmap versions,
- A catalogue of all actions and infrastructures in CS, SD and OI already implemented in each university,
- A template to identify the best practices implemented in each university,
- A catalogue of best practices identified by each university.

Beyond Module 6 representative meetings, Module 6 leaders also developed meetings with other Modules leaders and CIVIS Open Labs in order to find transversal/common aims and define synergies and cooperation.

Meetings

Internal Module 6 meetings: 4

Cross-Modules Meetings: 2

- **Transferable Skills Catalogue.** Together with coordinators of Module 4, 3 and 5, during July and September three meetings have been held to define a questionnaire to catalogue potential trainings to be open to the CIVIS community.
- **Module 4, Module 5 and Module 6** (15th November). The purpose of the meeting was to identify possible interactions and ideas in view of the recommendation drafting.

Other Meetings: 1

Open Labs and Module 3. A meeting with CIVIS WP3 leader and RIS4CIVIS Module 3 coordinator

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

has been held on 30th September. The purpose of this meeting was to discuss citizens science practices and innovation processes, with the possibility to develop, as a further step, joint activities towards their harmonization at the Alliance scale.

CIVIS/WP3 and RIS4CIVIS/Module 6 have in common the opening of the university to citizens, access to science and research and, as also dealt within Module 3, its anchoring in the local territory.

Results: Module 6 - Desired End-points & Preliminary Roadmap

As result of the work carried out during Consensus-building phase, and the discussions made so far with Module 6 representatives as well as cross-Module leaders, a list of four desired end-points as well as a roadmap to reach those aims has been elaborated.

The Module 6 desired end-points are:

1. **Promoting Network of CS/SD/OI experts**
2. **Developing Common training program at CIVIS level**
3. **Promoting Embedding Citizens & Society Politics**
4. **Creating strategies to engage citizens and society in science**

The following sub-sections presents the desired end-points and roadmaps created.

Please note that, **short-term goals** refer to the objectives to be set within the upcoming 3-5 months, that is to say, by March/April 2022; **medium term goals** refer to the objectives to be set between April 2022 to April 2023; **lLong-term** goals refer to the objectives to be set last year of the project and beyond.

1. Promoting Network of CS/SD/OI experts

The purpose of this end-point is the generation of a network of CS, SD and OI experts. This network can start by the identification of a list of the experts and latter with the publication of this list in the CIVIS Digital Campus.

This network will promote new ideas on CS/SD/OI; exchange of good practices, as well as identify challenges on these fields. The creation of a network of experts will also allow a further brainstorming on common actions to regularly be implemented at the CIVIS level.

Furthermore, this network could also provide support to the researchers and students willing to develop citizen science actions, and to make available resourcesfor other actions such as courses and training actions, best practice manuals, etc.

In order to carry out this end-point the following **actions** are planned:

- Identification of expets in each univeristy
- Creation of a best practise manual, integrating platforms of citizens consultation;
- Creation of platform of social participation in research projects.

The people involved in those actions will be, at universities level, experienced researchers, faculties members, project officers in science communication/dissemination. At CIVIS and RIS4CIVIS levels, regarding the promotion/organization of those actions, Module 2 could be implicated with respect to support the creation of a database. Moreover, CIVIS WP3 could be implicated in putting into practice this end-point taking advantage of the existence of different experts in the Open Labs projects.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

To this end-point be achieved some of the following **barriers** could be found:

- Insufficient funding,
- lack of time,
- lack of motivation,
- work overload,
- absence of response for the experts and asymmetric answers from the CIVIS members
- lack of time and motivation from the experts due to the absence of an adequate recognition of the value of this actions,
- work overload from the potential experts.

2. Developing Common training program at CIVIS level

The main objective of this end-point is to promote common courses between the members of the Alliance in the three pilars of the Module: SD/CS and OI. The achievement of this end-point will provide enhancing CS/SD/OI activities in the framework of RIS4CIVIS, raising awareness, gaining competencies, and stimulating CS/SD/OI actions.

This will also contribute tomore and better engaged researchers in science dissemination activities towards the general public.

So as to accomplish this end-point the following **actions** are envisaged:

- Create a training catalogue to be publically available on the Digital Campus platform,,
- Promote courses, trainings, seminars, workshops in SC, CS and OI in order to attract participants.

Modules 3, 4 and 5 are currently supporting to accomplish this end-point in respect to join forces to create a catalogue of trainings of all CIVIS universities (Transferable Skills Catalogue), this is part of the RIS4CIVIS WP4.

Furthermore, the target audience will be young and experienced researchers, administrative staff, PhD students, and faculty members.

The following **potential barriers** to accomplish this goal are:

- Insufficient funding,
- Lack of deep knowledge,
- Lack of time,
- Lack of motivation.

3. Promotion and Recognition of CS, SD and OI practices

The need for a complete recognition of the activities related with SD/CS and OI in the CV of the staff and the academics and the adequate financial support for these activies could provide a correct citzen engagement and the grow of activities in the CIVIS Universities for that purpose. The Module members will make proposals to the Universities' and CIVIS governance, to implement these institutional changes.

The purpose of this promotion and recognition is to motivate researchers in society engagement, encourage engagement in the Citizens Science and Science Dissemination fields, provide benefits to researchers with meaningful achievements in social Innovation, increase mutual understanding and

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

recognition of benefit for both science & society and contribute to a resilient society and democracy, and finally, support tackle SDGs by smart cooperation between science and society (e.g. behaviours, local / regional management decisions in the context of climate change etc.).

In order to carry out this end-point the following **actions** are planned:

- Implementing adequate recognition of the work undertakes within the SC/SD/OI including a convenient funding or rewarding scheme to promote and develop such actions;
- Creation of a CIVIS journal/magazine of SC/SD/OI actions. With the publication of those action and the interchange of information.

In achievement of these goals will include the involvement of Vice rectors, Researchers, Administrative staff, Faculties members. As a cross-cutting action, Module 6 could joint efforts with Module 5 in order to establish an award for CIVIS best practices in CS, SD, and OI, and also with CIVIS/WP3 which regards to civic engagement initiatives related to promotion of CS, SI, and OI practices.

Some of more meaningful **barriers** to achieve this end-point will be overcome insufficient funding, and difficulties to find a political/administrative consensus among the universities and limited support staff.

4. Creating strategies to engage citizens and society in science

The creation of useful tool for an adequate SD/ CS and OI is another fundamental aspect to be achieved within the Module 6. For that propose, we agreed to design a manual of best practise to be published on the Digital Campus targeting all the CIVIS community, to both academics and staff.

This should contribute to make science be more easily available and understood by the general public thought engaging society in CS, CD and OI actions, and supporting the translation of theory into practice in all CIVIS universities.

To do so, **actions** are planned such as:

Meetings and public events with the co-creations with the citizens which aim to explore strategies in the engagement, the creation of a best practice manual, integrating platforms of citizens consultation, as well as the creation of a platform of social participation in research projects are actions designed to accomplish the goals embedded in this end-point.

Some of the **social actors involved** are young/experienced researchers, administrative staff, students, and faculties members and citizens. As cross-cutting actions Module 6 are planning to join forces with Module 5 concerning promoting citizen engagement actions, and with CIVIS Open Labs, take in advance their CIVIS participatory platform.

One of the relevant **barriers** to overcome is the existence of big asymmetries in the development of CS projects and its tradition among universities.

The following tables illustrates the roadmaps developed to achieve Module 6 end-points.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Table 6 – Module 6: Desired End-points & Preliminary Roadmap

End-point	Why to achieve it	Actions	People involved	Timing	Barriers / Risks	Indicators
Network of CS/SD/OI experts	New ideas of CS/SD/OI; Exchange of good / bad practices (Dos &DON'Ts); identify challenges Brainstorming on common actions to regularly be implement at the CIVIS level This network could provide support to the researchers and students willing to develop citizen science actions This end-point would also provide an essential database for other actions included, such as courses and training	Creating a Database of CS/SD/OI Experts Meetings with CS/SD/OI experts Creating Manuals on CS/SD/OI	Experienced researchers Faculties members Project Managers in science communication CIVIS WP3 - Open Labs: " taking advantage of the existence of different experts in the Open Labs projects"	Mid-term	Insufficient funding lack of time lack of motivation work overload absence of response for the experts and asymmetric answers from the CIVIS members lack of time and motivation from the experts due to the absence of an adequate recognition of the value of this actions. work overload from the potential experts	Number of participants Number of researchers involved in CS actions Knowledge areas implicated

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

	actions, best practice manuals, etc.					

End-point	Why to achieve it	Actions	People involved	Timing	Barriers / Risks	Indicators
Common training program at CIVIS level	Enhance CS/SD/OI activities in the framework of RIS4CIVIS: raise awareness, gain competencies, stimulate action. Get researchers more (and better) engaged in science dissemination activities towards the general public	Create a training catalogue Promote courses, trainings, seminars, workshops in science communication, citizens science and open innovation in order to attract participants.	Young and experienced researchers Administrative staff students, pupils Faculty members Module 3,4,5 – transferable skills catalogue (database of trainings) CIVIS WP3-Open labs	Mid-term	Insufficient funding Lack of deep knowledge Lack of time Lack of motivation	Receive feedback from participants Monitor statistics of attendance Disseminate a survey after the events

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

End-point	Why to achieve it	Actions	People involved	Timing	Barriers / Risks	Indicators
Promotion and Recognition of CS, SD and OI practices	Motivate researchers in society engagement. Encourage work in the Citizens Science and Science Dissemination field. Provide benefits to researchers with meaningful achievements in social Innovation. On a more abstract level: increase mutual understanding and recognition of benefit for both science & society. Contribute to a resilient society and democracy. Help tackle SDGs by smart cooperation between science and society (e.g. behaviours, local / regional management decisions in the context of climate change etc.)	Adequate recognition of the work undertakes within the SC/SD/OI including a convenient funding to promote and develop such actions. Creation of a CIVIS journal/magazine of SC/SD/OI actions	Vice rectors, Researchers Administrative staff Faculties members Module 2 – creation of "CIVIS label" CIVIS – WP3 – civic engagement Module 5 - Establish an award for CIVIS Best Practices in OS	Long-term	Insufficient funding Difficulties to find a political/administrative consensus among the universities	Numbers of researchers involved in science dissemination and citizens science fields Asymmetries in the recognition across CIVIS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

End-point	Why to achieve it	Actions	People involved	Timing	Barriers / Risks	Indicators
Strategies to engage citizens and society in science	Make science more easily available and more easily understood by the general public. Increase the desire for knowledge (general knowledge). Help translation of theory into practice in all CIVIS universities. Engage society in research projects	Meetings and public events with the co-creations with the citizens which aim to explore strategies in the engagement. Creation of a best practise manual, integrating platforms of citizens consultation. Creation of platform of social participation in research projects	Young/experienced researchers Administrative staff Students, pupils Faculties members and citizens Module 5 – citizen engagement CIVIS WP3 - Open labs + civic engagement - CIVIS participatory platform	Mid-term	Existence of big asymmetries in the development of CS projects and its tradition	Number of participants from diverse society fields Numbers of researchers involved in science dissemination and citizens science fields

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

3. Obstacles and barriers

Module 1

Obstacles to achieve the Module 1 are related to different dimensions, which are described below:

HR and financial resources: Researchers may be occupied with teaching and other on-going research that make it difficult to engage in new research with researchers they do not know. Often research develops between researchers that know each other and after having found people they like to collaborate with their will to change to new partners might not be so strong. Financial resources are also crucial. It will be difficult to build new research teams without funding.

Academic freedom: Collaboration, especially around topics decided by central units or politicians, may interfere with the principle of academic freedom. This possible barrier is related to what role research is expected to have in society and if research topics are decided outside of academia or by university boards. Consequently, academic freedom can be a barrier to collaboration.

The view of how research excellence is achieved (top-down or bottom-up): The dominant view of how research excellence best is achieved among the partner universities is a bottom-up perspective. This can be a barrier to desired research focus on, for example the CIVIS hubs if this is not the kind of research the partner universities have their excellence in. The desired end-point of research to remain a bottom -up practice can therefore be a barrier for top-down desires about research areas.

Differences between human, social and natural sciences: The practice of science looks different in different academic disciplines, which makes it difficult to define one single end-point for research and innovation. Some disciplines have, for instance, difficulties in relating to the meaning of the concept innovation that may have a more clear meaning in some natural science disciplines. The fact that the practice of science, and also the role in the development of society that different academic disciplines play, can be a barrier to achieve to narrowly defined end-points for research and innovation.

Competition (rankings, funding): Universities live in a competitive environment where their performance often are measured in rankings. Depending on what kind of ranking different universities consider as important collaboration with universities that may be ranked lower will not be prioritized.

Existing research collaboration (why develop new instead of investing in existing stable collaboration): Much research is already conducted in different types of collaborations between researchers at different universities. Establishing well-performing research collaborations across disciplines and universities takes time, and potential unwillingness to give up well functioning teams and invest in establishing new research teams may therefore be a barrier.

Research profiles (basic research versus applied research): Different universities may have different profiles in their view of what type of research they are engaged in, such as basic or applied research. Such different profiles can be a barrier for establishing research collaboration.

Module 2

With the aim to define a model for sharing and opening RIs among CIVIS Partners, as well as to have a clear and overall overview of the current barriers, the M2 team has analysed in depth data and results

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

from the RI survey performed during the Benchmarking phase. The analysis provided evidence that most of the RIs mapped are in principle open to the academic community, at internal and external level, and to any kind of users or partners. The access could be free or, in the vast majority of cases, on demand and regulated on the basis of different rules and criteria such as:

- Scientific relevance and excellence of the research project,
- Mandatory training of users,
- Ethics authorization,
- Technical requirements,
- Availability of the RI,
- Mutual collaboration and reciprocity.

The access requirements are generally open. In fact, most of the examined RIs are already open to other universities, research centres, as well as private organisations. In addition, in a few cases RIs are even open to students as means for performing hands-on-training activities. In case of Digital infrastructure, free access is guaranteed.

Normally the access policies do not influence the access by external or non-national users. In this regard, it is also worthy to stress that no restrictions are generally applied to industrial users. Nevertheless, in some cases, for non-EU users, more stringent access conditions are applied, mostly linked to security reasons.

So the policies governing the use of the RIs are generally open to academic, internal, external, as well as any additional third-party users. The general openness of RIs is also confirmed by the RI use promotion activities/tools. In fact, in most cases RI promotion activities are addressed to international users.

As a consequence, the obstacles to sharing some RIs as emerged from the survey are generally not considered as insurmountable. The table below provides an overview of the current situation, the barriers mapped and the proposed suggestions regarding legal, logistical and financial aspects, identified in the framework of the work carried out in Module 2 Benchmarking phase.

Module 3

In the beginning there was no common understanding for the term endpoint. This had to be discussed together with the representatives of Module 3 and a consensus had to be build. The recommendations of WP2 leader and RIS4CIVIS coordinators were supportive to find this alignment. As recommended the mapping of the endpoints contained short-, mid- and long-term time horizons. Endpoints that can be addressed and implemented during the RIS4CIVIS project time frame have been collected as well as aims outside this timeframe were discussed.

The collection of the endpoints was time-consuming. A lot of entities, experts and different departments had to be involved. Some of the identified short-term endpoints within the benchmarking phase have changed or have already been implemented. That shows the dynamic process related to the consolidation of endpoints.

Another challenge within Module 3 was arranging meetings especially during the vacation period, lecture time and due to different availabilities. Therefore, a project plan was prepared in advance by

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

the Module leader and Module 3 representatives highly demonstrated flexibility to find common timeslots.

The format of the tandem helped to arrange meetings more efficiently and to create an added value for each individual participant. The preparation and follow-up of the meetings demanded commitment of each representative. Additional time for the summary of the in-depth discussions was necessary. Preparation time for the tailor-made structure of each meeting had to be taken into account.

For the creation and refinement of the roadmap in terms of innovation management activities and reinforcing
academia-business R&I cooperation the biggest challenge was that the situation differs of each single university and changes can happen dynamically. The identification of the desired endpoints of each single university and the arrangement of all endpoints within the CIVIS network was supportive to find common activities and goals.

Module 4

Most of the obstacles to define end points are related to the higher or lower level of development reached within certain fields. For example, since training is well developed in one way or the other in the CIVIS Alliance, a training program on transferable skills can be more easily envisaged than the harmonisation of career development strategies, which are less advanced and should go under a more extensive reflection to establish a solid basis.

On the other hand, national, regional or institutional barriers may apply. These directly link to working conditions and the recruitment field, which must yield a thoughtful approach on what is feasible or not in terms of logistics, usefulness and compromise. Arguably, working conditions for researchers will generally improve thanks to the work of the Modules, i.e. extended training offer, infrastructure access, Open Science practices expertise, etc. It is worth mentioning too that individual efforts will play a large role in producing a successful transfer of knowledge. Thematic meetings will include as many experts from the universities as possible to support knowledge sharing and meaningful discussion.

Since RIS4CIVIS is based on 8 different universities, these meetings may suffer a loss of scope, thus a more targeted strategy should accompany thematic meetings, i.e. bilateral meetings, tandems, etc. For the time being, these will be ad hoc and based on the will or interest of the universities themselves. Monitoring is also a difficult task given the ample field of Module 4. The question on whether following and achieving all end goals or ideas along the project remains. It would be hard to maintain several initiatives at the same time and by the same appointed members, hence, it should be noted that time to build not only transfer of knowledge/monitoring strategies but also to develop real actions in CIVIS is fundamental.

Module 5

The most important barriers in achieving all the aforementioned objectives are related to the allocation of resources and time. However, there are also other factors potentially impeding a smooth dissemination of OS practices within the alliance.

Cultural change

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

• Different stages of development (infrastructures, policies, training etc.) in implementing OS policies and practices in the CIVIS universities. Lack of global OS approach: OS strategies are limited to Open Access to publications and to RDM/FAIR data in most universities of the Alliance. The other aspects of OS have to be addressed in a global OS approach.
• Lack of common/ shared OS resources (e.g., a catalogue of OS services and resources).
• Lack of academic leadership: academic leadership is required to develop and support an OS strategy to the academic authorities.
• Lack of coordination in the development and the implementation of OS-related activities: all the relevant stakeholders have to join and work together in a coordinated manner.

Future of scholarly communication
• Funding is needed. Either for supporting diamond OA publications or to support a common approach to APCs.
• Training: raising awareness about differences about OA is needed, as currently these differences determine a variety of practices at the university level (e.g., Plan S compliance).
• Interoperability issues of the local repositories.

Research Data Management
• A variety of interoperability issues between the repositories of CIVIS members.
• Lack of skilled staff.

Education and Skills
• The current offer of OS-related courses is not known in other institutions, except from those in which they are offered.
• The courses/ trainings are most of the time in the local language. Need for translations and common/coordinated training events.

Recognition and Rewards & Next Generation Metrics
• The (apparent) lack of awareness of academic authorities about OS evaluation in research assessment. Hence, different developmental policies in each institution are expressed by the Rectors/Senates.

• No consensus (at the moment) for: (1) an OS award; (2) the need for specific open science indicators and what they should be; (3) how to implement the new indicators and how to conduct the research assessment in each university.

Research Integrity
• Different priorities and policies in each institution
• Different relations between ethics committees in CIVIS universities, OS projects, administrative structures.

Module 6

The short period to develop this second stage is one of the aspects that limit the capability of the working group.

The interests of the working groups that were represented by the Module 6 members were different from the others. As a result of the asymmetries detected in the three aspects included in the Module in the benchmark stage, the propose of end-points were different.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016691.

Even if members' attitude has been always excellent, the absence of previous experience in some of Module 6 main axes (Open Innovation, Science Dissemination, or Citizens Science), made difficult the final elaboration of the end-points and roadmaps.

Moreover, changes in the Module 6 members synthesis have also introduced some difficulties in the working plan. In this direction, we consider that the continuity of the members would help the progress of the project.

In terms of desired end-points selected, some potential obstacles are set up such as insufficient funding, lack of time, lack of motivation, work overload, and lack of time and motivation due to the absence of adequate recognition of the value of implementing actions in CS, SD, and OI.

4. Recommendations and Conclusions

Throughout the current Consensus-building phase, interesting initiatives have been proposed and put into practice by the 6 Modules.

Several initiatives concern only one module (CIVIS label for RI for instance). However, transverse activities are common to several/all modules and should be implementated in the CIVIS Digital Campus; as for example the creation of a catalogue of trainings $, covering most of the Module fields as well as the creation of common databases and platforms to share relevant information and strengthen collaborations amongst the research staff in one or several fields of the Modules. These needs have been confirmed by all the Modules duting the Consensus-building phase and work with the CIVIS IT teams is already in place to fasten its implementation (also as part of WP4).

It is worth mentioning, that these initiatives emerge not just from the internal work in each Module but also from the effort of Module Leaders to find transversal aims and develop common actions defined by the Modules leaders during cross-Modules meetings. Certainly, these initiatives will enrich and strengthen the results from each Module and go beyond what was initially expected from RIS4CIVIS. In this context, to achieve these goals strong efforts have been carried out by all RIS4CIVIS teams and relies on a great adaptability and sense of initiatives of all the teams involved. The work has also been developed smoothly thanks to the technical support of the CIVIS IT team (David Touzot, Amina Laanab), and the WP6 (Overall Coordination) team.

Nonetheless, insufficient funding and a short time to settle on and implement the common actions could undermine the fulfilment of those proposals. The Monitoring Committee will have a crucial role to prioritise future steps. Further, as a recommendation, we suggest opening the possibility to fund some of the actions through other source of funding (eg: HEUR calls; internal CIVIS calls etc.). An extending period for discussing and implementing the roadmap of each of the desired end-points at internal and cross-Module levels could also be envisaged and further discussed.