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EOSC service and FAIR uptake strategy

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Abstract: Deliverable D6.1 – EOSC service and FAIR uptake strategy – Provides the detailed description of the plan and all related actions in order to strengthen the uptake of the European Open Science Cloud and the FAIR principles in the region.

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References

- [1] Project NI4OS-Europe-857645 - Annex I - Description of the Action
- [2] D2.1 Stakeholder map, inventory, policy matrix
- [3] D7.1 Internal and external communication platform

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List of Acronyms

EOSC	European Open Science Cloud
OpenAIRE	Open Access Infrastructure for Research in Europe
FAIR	Findable Accessible Interoperable Reusable
ORDM	Open Research Data Management
OS	Open Science
FAIRsFAIR	Fostering Fair Data Practices in Europe
EOSC Nordic	EOSC-Nordic
EXPANDS	EOSC Photon and Neutron Data Services
EOSC Synergy	European Open Science Cloud - Expanding Capacities by building Capabilities
EOSC Pillar	Coordination and Harmonization of National Initiatives, Infrastructures and Data services in Central and Western Europe
WP	Work package
PID	Persistent Identifier
PMB	Partner member board
ERA	European Research Area
RoP	Rules of Participation

Executive summary

What is the focus of this Deliverable?

The focus of this deliverable is to describe all the actions planned to strengthen the uptake of EOSC and FAIR principles to all identified stakeholders in all countries participating in NI4OS-Europe. In particular, a plan of how EOSC and FAIR principles will be promoted throughout the user communities directly involved in the project either as thematic service providers or as users will be analyzed. The analysis of the survey (WP2) will provide all necessary inputs to identify the stakeholders' needs and thus better understand the uptake strategies and actions that need to be put in place. The actions that need to be adopted in order to raise awareness on the relevant topics to the user communities of each country will be described and EOSC promoters will be appointed to fulfill the task. Collaborations and synergies with other projects will be reported.

What is next in the process of delivering the NI4OS-Europe results?

The deliverable and progress are described in the project Annex-I – Description of the Action [1]. The presented plan is expected to be refined during the project lifetime thus adapting to any new project developments that might occur. Detailed report of all actions taken to ensure the promotion of EOSC and FAIR uptake in the user communities will be reported in the deliverable D6.7 - Report on EOSC and FAIR uptake in the communities, in M35 of the project.

What are the deliverable contents?

This deliverable describes in detail the EOSC and FAIR principles, as well as analysis of the needs and requirements according to the survey (WP2), and a plan of the awareness actions that need to be adopted. Furthermore, an analysis of the guidelines produced will be reported so that the EOSC and FAIR principles are successfully spread by the National EOSC promoters. It also identifies points and sections where the collaboration with other projects is essential to fulfill the vision of the European Open Science Cloud.

Conclusions and recommendations

The plan presented provides support guidelines for the EOSC service and FAIR principles uptake in communities and is to be implemented by all NI4OS-Europe partners, in-line with the Annex-I - Description of Action [1]. The plan has been specifically customized according to the analysis of the results from the survey. The plan will enable the best possible approach to provide all the necessary information to stakeholders in order to fulfill the EOSC policies, vision and mission. This will be implemented by face-to-face communication with the user communities on national level, organization of seminars and webinars (where user communities will be invited), and distribution either electronically or on paper of the related information.

1 Introduction

Task 6.3 has as main objective to raise awareness for EOSC and FAIRness throughout the user communities directly involved in the project either as thematic service providers or as users. Task 6.3 will invest effort in identifying appropriate actions to widely inform stakeholders on the benefits of the adoption and use of EOSC and FAIR principles and policies.

This deliverable defines the implementation plan and the actions that need to be taken by the project partners in order to ensure demonstration of services integrated into EOSC as well as the understanding of the EOSC policies, FAIR best practices, access and usage policies, etc. This will be implemented by face-to-face communication with the user communities on the national level, organization of seminars and webinars where user communities will be invited to join, and distribution either electronically or on paper of the related information. In addition, the project will work towards the production of basic guidelines on the usage of the EOSC, including access as well as explaining FAIR principles and basic policies on publishing literature, data, software, workflows, etc.

The presentation of EOSC and FAIR principles is made in order to make sure that definitions are well defined and understood. Furthermore, section 2 provides an overview of the stakeholders' survey and the main results from the survey are provided by analyzing the raw data regarding the issues of EOSC and FAIR. The results are graphically presented and the stakeholders' needs will be stated, to provide a clear view of the gaps and needs of the stakeholders.

The section 3 of this deliverable will focus on the awareness actions that need to be taken and the needs on the production of training/informative material, and guidelines for different stakeholders in order to make sure that they get familiar with the terms, and philosophy of Open Science, FAIRness, EOSC vision and mission. For that scope EOSC promoters will be engaged to achieve the best possible results and to coordinate with the dissemination of all relevant knowledge. In combination with this the translation officers chosen by the project's partners and their duties will be assigned.

Part of this deliverable will also be the reference to the Collaboration schemas and subjects with other Projects and especially the INFRAEOSC-5b projects and the FAIRsFAIR project to make sure the efforts will not be duplicated.

Conclusions are summarized in section 5, whereas the appendix contains the questions regarding the specific issue from the questionnaire used in the survey.

2 EOSC and FAIR principles

2.1 Introduction

European Open Science Cloud (EOSC), is considered as an open and trusted environment for managing research data, a federated model of EOSC where the Member States of EU, should take actions in order to prepare national stakeholders to connect.

Even though the Commission presented its vision for the European Open Science Cloud (EOSC) in April 2016 Communication on the 'European Cloud Initiative',¹ as a part of the Digital Single Market Strategy, EOSC was formally launched in November 2018 at the University of Vienna.

According to the European Cloud Initiative policy², the European Open Science Cloud (EOSC) will offer Europe's 1.7 million researchers and 70 million science and technology professionals a virtual environment to store, share and re-use the large volumes of information generated by the big data revolution.

2.2 What are the EOSC principles

The paper "European Open Science Cloud for Research"³ details eight elements for the success of EOSC: **open, publicly funded and governed, research-centric, comprehensive, diverse & distributed, interoperable, service-oriented and social.**

In alignment with FAIR principles EOSC is expected to fulfill the vision of the "One stop-shop" for researchers and other interested parties.

In addition, according to the EOSC strategic implementation plan, the aim of EOSC is "to build the necessary trust for wide deployment among a large variety of research communities, so it is essential that the development of EOSC follows principles that will drive its implementation."⁴

The plan defines the following rules as essential for the success of EOSC.

1. Cooperation

Respectful cooperation between stakeholders, whereby each stakeholder respects the autonomy, integrity, processes, and intellectual property rules of the others.

¹ 2 COM(2016)178 final

² The European Cloud Initiative, policy, <https://ec.europa.eu/digital-single-market/en/%20european-cloud-initiative>

³ European Open Science Cloud for Research, position paper, <https://doi.org/10.5281/zenodo.32915>

⁴ European Open Science Cloud (EOSC) work plan 2019-2020 <https://www.go-fair.org/wp-content/uploads/2019/08/European-Open-Science-Cloud-EOSC-strategic-implementation-plan.pdf>

2. Decision Process

- **Openness:** Processes shall be open to all interested and informed parties.
- **Broad consensus:** Processes will allow, for all points of view, to be considered and addressed, so that an agreement can be reached across a range of interests.
- **Transparency:** Stakeholders will provide public notice of proposed development activities, the scope of work to be undertaken, and the necessary conditions for participation. Easily accessible records of decisions and the materials used in reaching those decisions will be provided.
- **Balance:** Activities shall not be exclusively dominated by any particular person, organization or interest group.
- **Due process:** Decisions will be made with equity and fairness among contributors. No one party will dominate or guide decisions. Processes will be transparent. Periodic reviews and updating will be well defined.

3. Common interest criteria for decision-making will be such that decisions:

- Will be made and defined based on common interest.
 - Will provide global interoperability, scalability, stability, and resiliency.
 - Will enable global cooperation.
 - Will serve as a building block for further innovation.
4. **Availability:** Decisions will be made accessible to all for implementation and deployment. Stakeholders will define procedures to develop contributions that can be implemented under open terms.
 5. **Voluntary adoption:** Decisions will be voluntarily adopted and success will be determined by the effective use by research communities.
 6. **Role of Software:** While all data will be considered, 'first class' citizens and treated on a common basis, software will play a specific role as enabler of services and interoperability. In order to be EOSC compliant, software developments will be open source by default. Exceptions will have to be justified and approved after appropriate debate. Software development will be conducted on open development platforms to allow for participation and contribution by all stakeholders interested.
 7. **Role of Working Groups:** While addressing key priorities, Working Groups will be the standard way to proceed. Working Groups will be open by default to any interested participant and will be conducted following the driving principles for implementation.

Moreover, the rules of participation define three objectives⁵ as the EOSC bottom-line.

The increase in value of scientific data assets is set as the number one objective. This will be effective by making them easily available to a greater number of researchers, across disciplines (interdisciplinarity) and borders (EU added value).

Secondly, the reduction of costs in scientific data management, while ensuring adequate protection of information/personal data according to EU regulations (e.g., EU 2016/679) where the data protection is by default obligatory.

Further, the issues of inclusiveness, bearing a clear value proposition that is simple to adopt, among other attributes are also set as objectives of EOSC.

A key part of the governance framework is a set of rules of participation that support these objectives by setting the rights and responsibilities of participants to the EOSC. Collectively, they will help ensure that the objectives of the EOSC, described above, are met.

2.3 What are the FAIR principles

The FAIR principles were coined as a term at a Lorentz workshop in 2014⁶.

The data-intensive science for the facilitation of knowledge discovery by assisting humans and machines in their discovery of, access to, integration and analysis of, task-appropriate scientific data and their associated algorithms and workflows, was defined as one of the grand challenges. FAIR principles were published in 2016, in the article titled “The FAIR Guiding Principles for scientific data management and stewardship” by Wilkinson et al⁷.

The authors intended to provide guidelines to improve the findability, accessibility, interoperability, and reuse of digital assets. The principles emphasise machine-actionability (i.e., the capacity of computational systems to find, access, interoperate, and reuse data with none or minimal human intervention) because humans increasingly rely on computational support to deal with data as a result of the increase in volume, complexity, and creation speed of data.

15 principles and a set of 14 metrics⁸ have been defined to quantify levels of FAIRness described as follows:

Findable

⁵ European Open Science Cloud: Rules of participation <https://www.eosc-portal.eu/governance/rules-participation>

⁶ <https://www.force11.org/fairprinciples>

⁷ Wilkinson, M., Dumontier, M., Aalbersberg, I. *et al.* The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* **3**, 160018 (2016) doi:10.1038/sdata.2016.18

⁸ <https://github.com/FAIRMetrics/Metrics>

The first step in (re)using data is to be able to find them. Metadata and data should be easily findable by both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services, so this is an essential component of the FAIRification process.

1. (Meta)data are assigned a globally unique and persistent identifier.
2. Data are described with rich metadata.
3. Metadata clearly and explicitly include the identifier of the data they describe.
4. (Meta)data are registered or indexed in a searchable resource.

Accessible

Once the user finds the required data, she/he needs to know how they can be accessed, possibly by including authentication and authorization.

1. (Meta)data are retrievable by their identifier using a standardized communications protocol.
 - 1.1 The protocol is open, free, and universally implementable.
 - 1.2 The protocol allows for an authentication and authorization procedure, where necessary.
2. Metadata are accessible, even when the data are no longer available.

Interoperable

Data usually need to be integrated with other data. In addition, data needs to interoperate with applications or workflows for analysis, storage, and processing.

1. (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
2. (Meta)data use vocabularies that follow FAIR principles.
3. (Meta)data include qualified references to other (meta)data.

Reusable

The ultimate goal of FAIR is to optimize the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings.

1. Meta(data) are richly described with a plurality of accurate and relevant attributes:
 - 1.1. (Meta)data are released with a clear and accessible data usage license.
 - 1.2. (Meta)data are associated with detailed provenance.
 - 1.3. (Meta)data meet domain-relevant community standards.

The principles refer to three types of entities: data (or any digital object), metadata (information about that digital object), and infrastructure.

3 Analysis of survey and identification of the needs

3.1 Introduction

The NI4OS-Europe survey was active between October-December 2019, was distributed to 18 countries, and a total of 2076 questionnaires were sent; from these, 575 answers were submitted.

According to the chart below out of 575 participants to the survey, 31 did not provide their origin. Moldova has the most responses with 78, Croatia 43, Serbia 53, Romania 47 and Bulgaria 43. From Slovenia 41 and North Macedonia 34 participants responded. Hungary and Cyprus responded to 31 questionnaires. Greece sent 28 responses while Georgia and Bosnia-Herzegovina 20 each. From Montenegro 19, Albania 15 and Turkey 14 participants responded. Finally, from Kosovo 2 responses were sent.

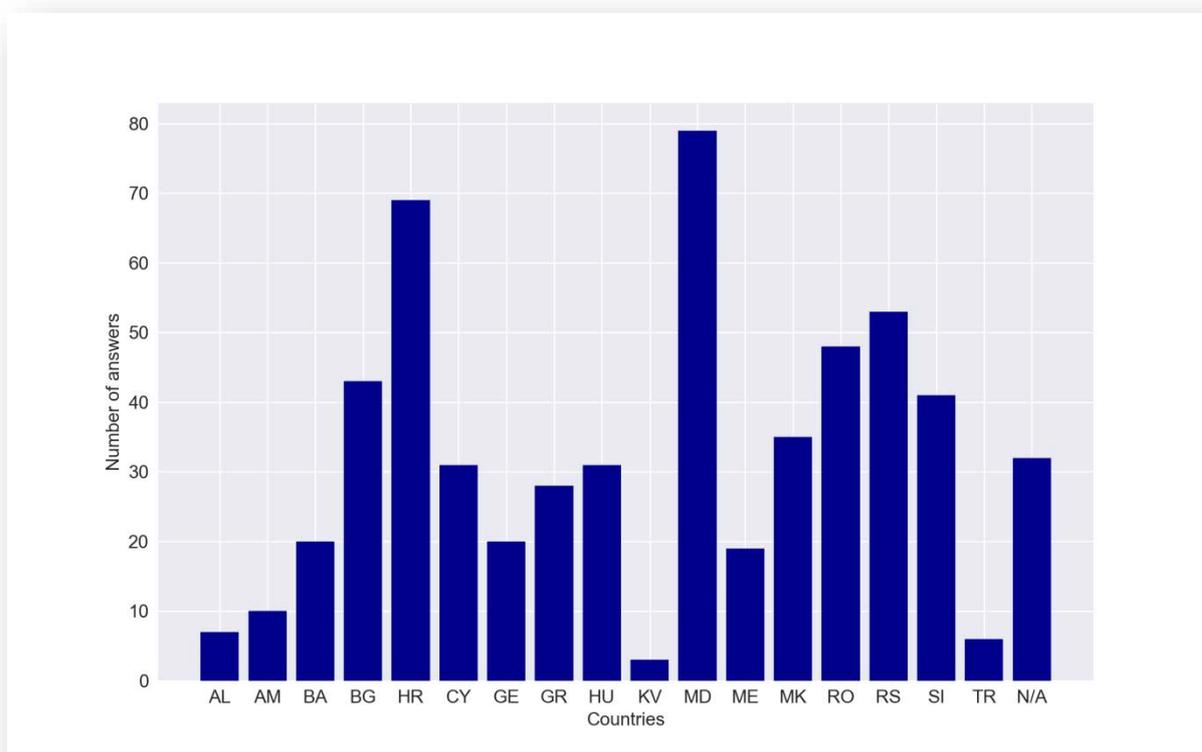


Figure 1. Survey participants from each participating country

3.2 EOSC related outcome

3.2.1 Stakeholder's responses

Stakeholders were asked about their knowledge regarding EOSC-related issues. From the results we can see that most of the participants are not really familiar with EOSC.

For the purposes of this deliverable, 4 questions of the survey were further analyzed in order to identify the real landscape and needs of the stakeholders.

Specifically, to the question "How familiar are you with EOSC?" we can see in the chart below that out of 575 respondents, 32 (5.6%) did not respond to this question. From the 543 who did provide an answer to the question, 43.8% are not very familiar, 29.7% are familiar, 18.2% are not familiar at all and 8.3% are very familiar.

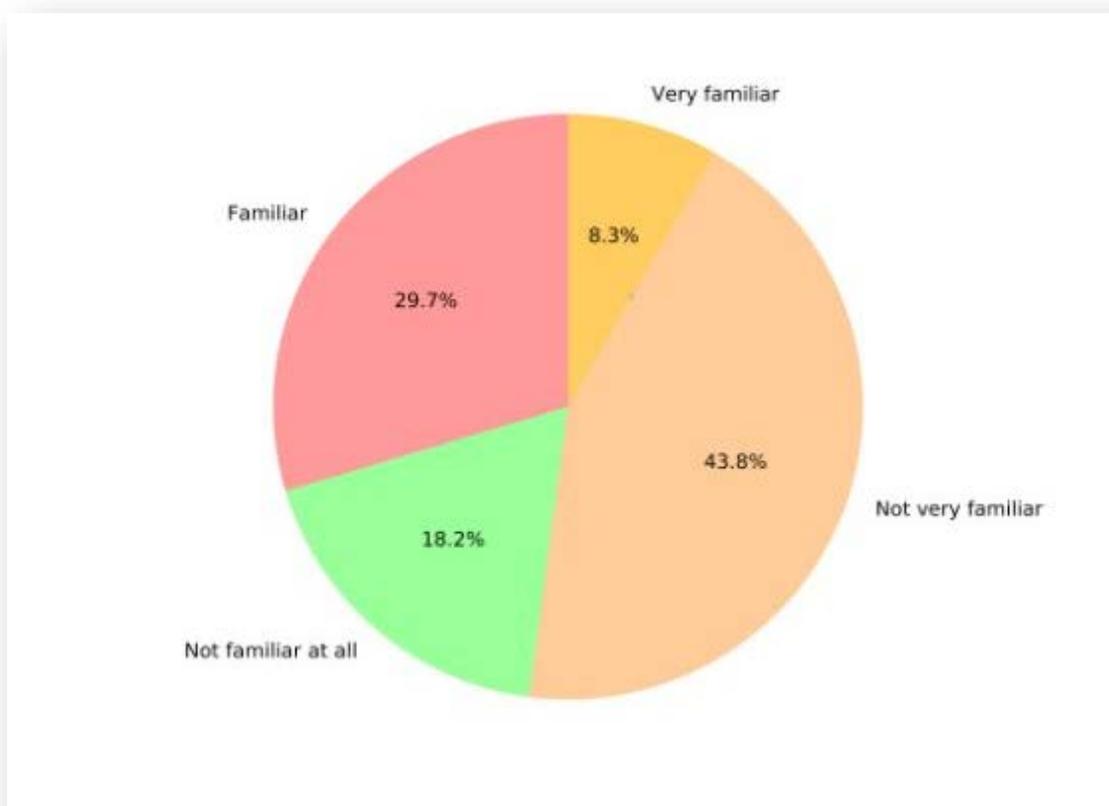


Figure 2. Responses to the question "How familiar are you with EOSC?"

For the question, "Does your organization provide support for integration of your services in EOSC and for the accompanying implementation and upkeep of security standards and policies", 83% did not provide an answer, 5.2% said that their organization provides support through funded projects, 3.1% with dedicated staff, 3.3% answered that there is no support and 3.1% they didn't know. As the biggest percentage didn't provide an answer to this question we can assume that there is no support in place or that respondents are not aware of them, or it has not been properly communicated.

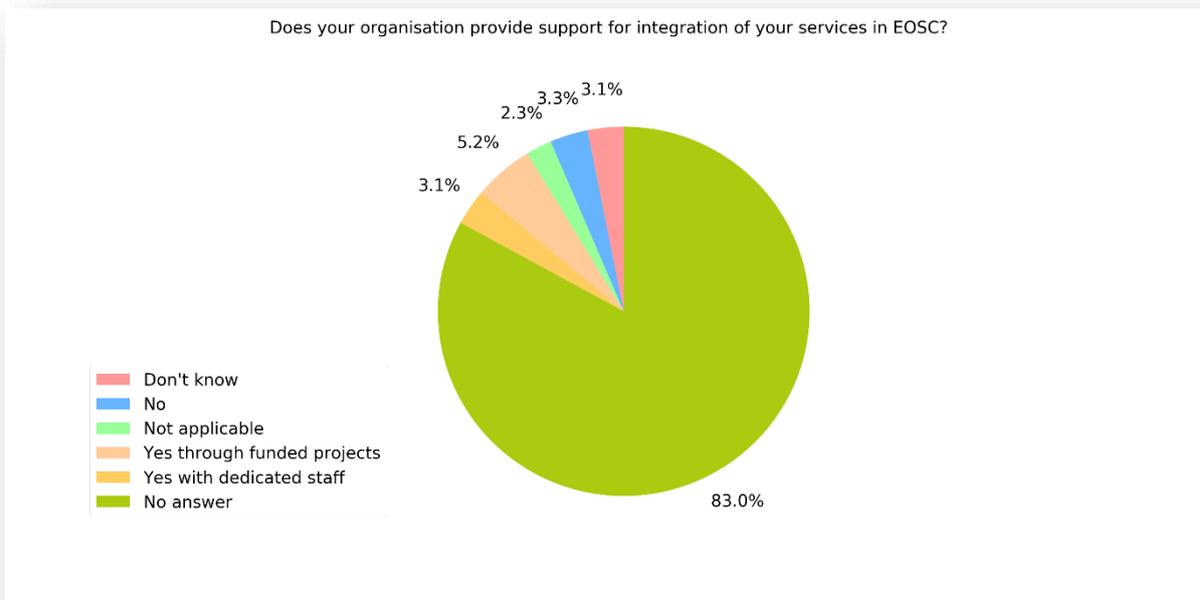


Figure 3. Responses to the question “Does your organization provide support for integration of your services in EOSC and for the accompanying implementation and upkeep of security standards and policies?”

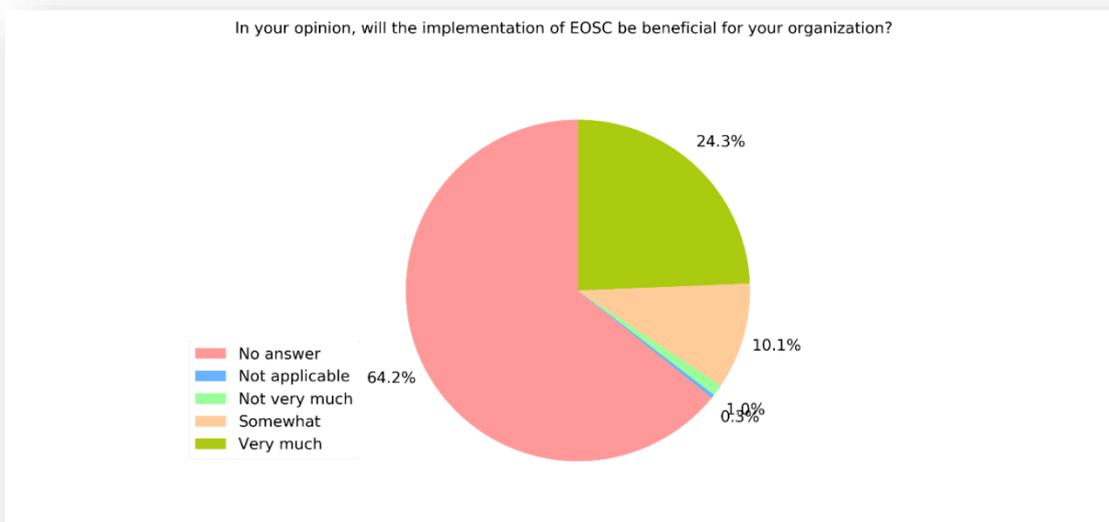


Figure 4. Responses to the question “In your opinion, will the implementation of EOSC (European Open Science Cloud) be beneficial for your organization?”

To the question about the opinion of stakeholders on the level of benefit to their organizations, only 24.3% believe that it will be very much beneficial and 64.2% did not

answer this question. Due to the high percentage of the lack of answers we can again assume that the absence of support plays a key role to the knowledge of how beneficial EOSC will and can be.

To the open-ended question “What to expect from EOSC”, several answers were provided expressing the participants’ opinions. Some of these answers are highlighted below:

- Easier data and information sharing, access to computational resources.
- If successful, the platform will help to increase the connectivity between researchers belonging to European Research Area (ERA) and make ERA more competitive.
- An EU common friendly space for open science but also for other sector of the economy. Interoperability.
- Single point of access to national and international R&E services and resources.
- Training and support for various user communities.
- Awareness raising for the importance of open data and open scientific results.
- Better exchange of data.
- Guidelines and support for developing general services that can be used to serve the R&E community that we serve on a centralized national level.
- Possibilities for international cooperation and knowledge and experience exchange.

3.3 FAIR related outcome

3.3.1 Stakeholders’ responses

Regarding the issue of FAIRness, stakeholders were asked to provide their opinion regarding their familiarity and needs on training and support on making their data FAIR. For the purposes of this deliverable 9 questions of the survey were further analyzed in order to identify the real landscape and needs of the stakeholders.

The results are provided as follows:

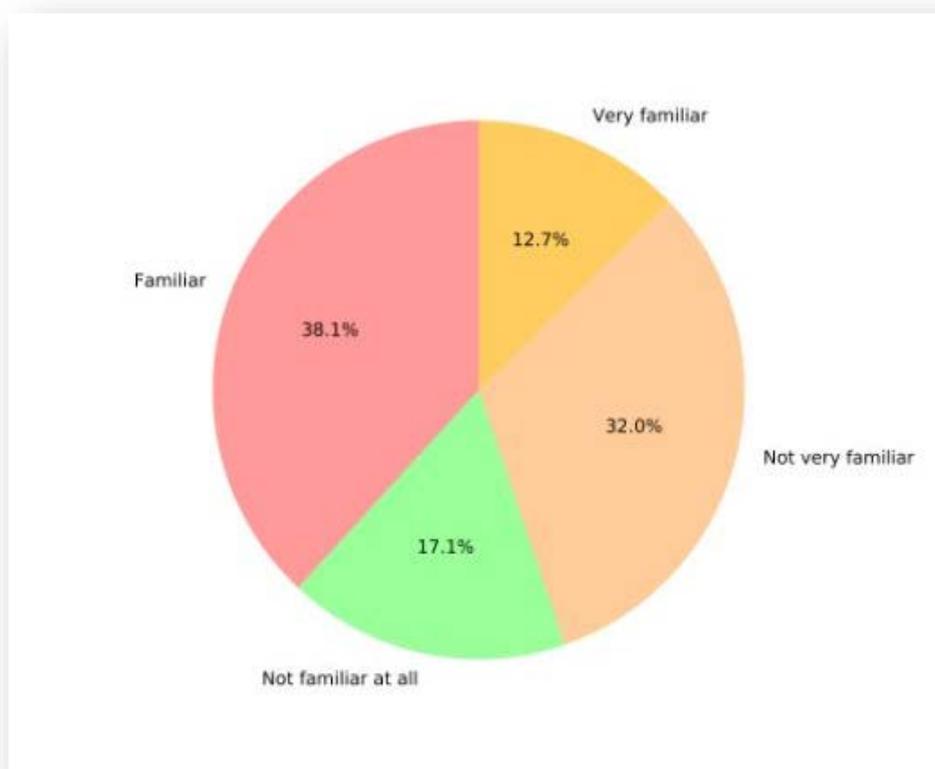


Figure 5. Responses to the question “How familiar are you with the concept of FAIR regarding data?”

To the question “How familiar are you with the concept of FAIR regarding data”, people seem to be more familiar with FAIR than with EOSC. Out of 575 who responded 32 (5.6%) did not respond to the question. Out of the 543 people who provided an answer (see chart), 38.1% said that they are familiar, 32.0% not very familiar, 17.0% are not familiar and 12.7% are very familiar.

To the question about “What particular areas of training support or advice, researchers and support staff need in relation to making data FAIR”, out of the 575 participants who responded 72 people (12.5%) did not answer. From the participants who did respond (see chart), most of them admitted that much is needed to be done concerning various subjects.

About the stewardship of FAIR outputs (data, software) 71.0 % answered that much is needed to be done, 25.4% responded that stewardship is somewhat needed and 3.6% that stewardship is not needed.

For training others including doctoral candidates 71.0% answered that much is needed, 25.4% some things are needed and 3.6% that nothing is needed.

Concerning data analytics and statistical techniques 58.6 % answered that much is needed, 35.8% some things are needed, and 5.6 % that nothing is needed.

About finding and reusing data 61.6% claim that much is needed to be done, 32.8% that this is somewhat needed, and 5.6% said that nothing is needed.

Regarding finding FAIR data repositories 58.4% answered that much is needed, 36.4% that some actions are needed and 5.2% said that nothing is needed.

For raising awareness about FAIR principles 63.0% said that much is needed, 32.6% that some actions are needed, and 4.4% said that nothing is needed. 12.5% did not answer.

Concerning Data wrangling 47.3 % said that some actions are needed, 40.8% that much is needed, and 11.9% that nothing is needed. 12.5% did not answer.

Regarding citing and acknowledging contributions 52.3% said that much is needed, 35.0% that this is somewhat needed and 12.7% that it is not needed. 12.5% did not answer.

About using or developing tools/services 49.2% answered that much needed, 31.8% somewhat needed, 12.5% did not answer and 6.4% no needed. 12.5% did not answer.

Concerning sharing data (ethics, data protection) 56.3% said that much needed, 36.4% somewhat needed and 7.4% no needed. 12.5% did not answer.

Regarding costing and resourcing RDM in proposals 47.9% said that much needed, 41.9% somewhat needed, and 10.1% not needed. 12.5% did not answer.

About documenting data or code to make it FAIR, 61.4% answered that much needed, 31.2% somewhat needed and 7.4% no needed. 12.5% did not answer.



Figure 6. Responses to the question "In your opinion what particular areas of training, support or advice researchers and support staff need in relation to making data FAIR?"

To the question whether respondents' organizations impose internal rules regarding the following aspects: Publication repositories, Open data, Data management plans, Data protection in research data, Publishing platforms, PIDs, Long-term availability of research data, Article/Book processing charges, Open-source software, Open education resources, Open practices, FAIR, and Intellectual property rights and copyright the following results were provided: 72 (12.5%), out of the 575 participants did not answer this question. Table 1 below illustrates the answers given by the 503 participants who provided feedback.

	Encouraged but optional	Mandatory for all	Mandatory for some projects/groups	No regulation	Not applicable
Publication repositories	28	26.8	25.8	14.9	4.4
Open data	37	12.1	23.1	21.9	6
Data management plans	27.2	10.9	23.9	30.2	7.8
Data protection in research data	21.5	25.4	24.1	21.1	8
Publishing platforms	33.6	14.1	20.1	24.3	8
PIDs	30.8	19.3	22.3	17.1	10.5
Long-term availability of research data	27.8	15.3	24.5	25.8	6.6
Article/Book processing charges	23.1	7.2	16.3	34.4	19.1
Open-source software	34.6	7.8	16.7	30.4	10.5
Open education resources	35.6	10.1	19.5	27.6	7.2
Open practices	31.8	18.7	21.5	19.5	8.5
FAIR	32.6	10.9	16.9	29.8	9.7
Intellectual property rights and copyright	19.9	46.1	21.5	7.2	5.4

Table 1. Responses to the question “Does your organization impose internal rules regarding the following aspects?”

Respondents seem to consider the imposition of internal rules on intellectual property rights and copyright (46.1%), and on publication repositories (26.8%), and data protection in research data (25.4%), to be mandatory for everybody in an organization. Less need for imposing internal rules for all is registered for all other aspects ranging from 19.3% for PIDs to 7.2% for Article/Book processing charges.

Next, regarding the respondents' views on the imposition of internal rules being mandatory for some projects/groups of the organization, no notable variations were recorded among the various aspects, with an average of 21.25%, with the highest percentage being 25.8%, for publication repositories, and the lowest being 16.3%, for Article/Book processing charges.

Furthermore, respondents offered that imposing internal rules is encouraged but remains optional within their organizations mostly relating to Open data (37%), open education resources (35.6%), open-source software (34.6%), publishing platforms (33.6%), FAIR (32.6%), Open practices (31.8%), PIDs (30.8%), Publication repositories (28%), Long-term availability of research data (27.8%), and Data management plans (27.2%). Less encouragement for regulation is given to Article/Book processing charges (23.1%), Data protection in research data (21.5%), and Intellectual property rights and copyright (19.9%).

Respondents suggest that their Organizations don't impose any major internal regulation on such aspects as Article/Book processing charges (34.4%), Open-source software (30.4%), Data management plans (30.2%), FAIR (29.8%), Open education resources (27.6%), Long-term availability of research data (25.8%), and Publishing platforms (24.3%). Moderate regulation is imposed on Open data (21.9%), Data protection in research data (21.1%), and Open practices (19.5%). Lastly, more regulation is imposed on PIDs (17.1%) Publication repositories (14.9%), and Intellectual property rights and copyright (7.2%).

Finally, an average of 8.59% stated that this question is not applicable to their Organization, with the highest percentage being 19.1% for Article/Book processing charges, and the lowest being 4.4% for Publication repositories.

Important information was provided also for the issue of the Organizations provision of support and training in the areas of: Repositories, Research data, Publishing platforms, PIDs, Licenses, Intellectual property rights, Article/Book processing charges, Open-source software, Open education resources, and Open practices.

72 (12.5%), out of the 575 participants did not provide an answer to this question. Table 2, below, illustrates the answers given by the 503 respondents.

	Don't know	Yes	No, but planned	No, but not planned	Other
Repositories	10.5	40.6	22.9	23.3	2.8
Research data	10.1	26.8	34.4	26	2.6
Publishing platforms	8.9	32.6	25.2	29.6	3.6
PIDs	11.7	29	25.6	30.4	3.2
Licenses	11.1	30.8	22.7	30.8	4.6
Intellectual property rights	8.3	47.5	19.1	21.9	3.2
Article/Book processing charges	12.5	25	19.5	39.2	3.8
Open-source software	11.7	27.4	26.8	29.6	4.4
Open education resources	9.3	36.4	25.4	23.9	5
Open practices	9.7	38	23.1	25	4.2

Table 2. Responses to the question “Does your organization provide support and training in the following areas?”

Respondents' organizations seem to emphasize on providing support and training mostly on Intellectual property rights (47.5%), Repositories (40.6%), Open practices (38%), and Open education resources (36.4%), and less on Publishing platforms (32.6%), Licenses (30.8%), PIDs (29%), Open-source software (27.4%), Research data (26.8%), Article/Book processing charges (25%).

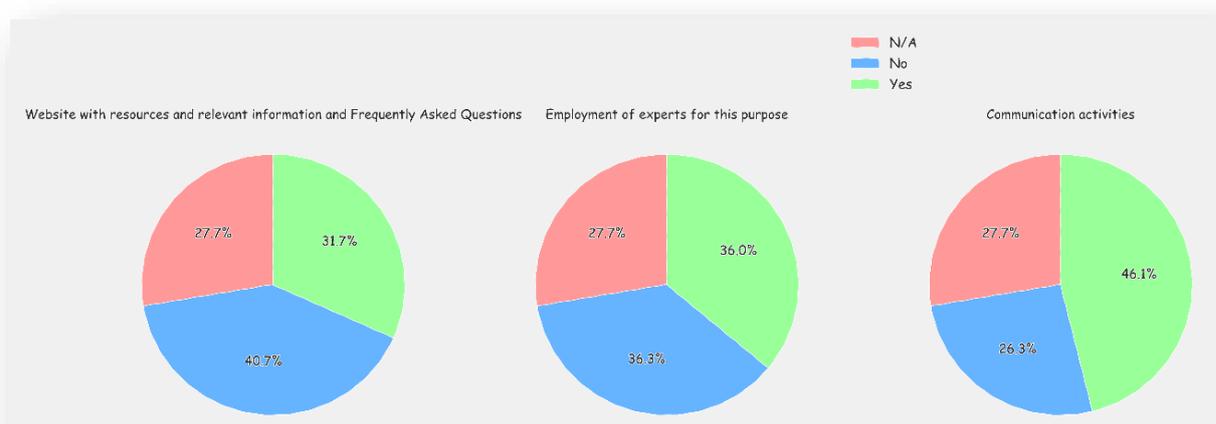
Furthermore, respondents answered that even though their Organizations currently do not provide any support and training regarding the aforementioned areas, they plan to in the future. The importance they award to these areas with regard to providing future support and training is as follows: Research data (34.4%), Open-source software (26.8%), PIDs (25.6%), Open education resources (25.4%), Publishing platforms (25.2%), Open practices (23.1%), Repositories (22.9%), Licenses (22.7%), Article/Book processing charges (19.5%), and Intellectual property rights (19.1%).

Next, participants offered that regarding these ten areas, their Organizations do not currently provide any support and training, nor do they plan to in the future, as it follows: Article/Book processing charges (39.2%), Licenses (30.8%), PIDs (30.4%), Open-source software (29.6%), Publishing platforms (29.6%), Research data (26%), Open practices (25%), Open education resources (23.9%), Repositories (23.3%), Intellectual property rights (21.9%).

Overall, out of the 503 participants who provided feedback, an average of 10.38% stated that they did not know whether their Organizations provide support and training in the aforementioned areas, with the highest percentage being 12.5% for Article/Book processing charges, and the lowest being 8.3% for Intellectual property rights.

Furthermore, an average of 3.74% stated that their Organizations provide other means of training material, with the highest percentage being 5% for Open education resources, and the lowest being 2.6% for Research data.

To the question “How does your organization provide and support training”, participants provided information relating to the ways their Organization provide support and training, as shown in figure 7 below. 46.1% of the survey respondents answered that they mostly choose communication activities, 36% prefer employing experts for this purpose, and finally 31.7% provide support and training through including in their website resources, relevant information and Frequently Asked Questions. 27.7% of the respondents



commented that this question is not applicable to their Organization.

Figure 7. Responses to “How does your organization provide and support training?”

Another important question analyzed for the purpose of this deliverable was about “Who are the target groups for training”?

The results can be seen in figure 8 below. Respondents identified researchers and academic staff as the group in greater need of training with 62.6%, next students with 44.3%, librarians with 24.5%, research infrastructure providers with 14.6%, and finally SMEs with 8.9%. More than a quarter of the respondents (27.7%) noted that this question is not applicable to their Organization.



Figure 8. Responses to the question “Who are the target groups for training?”

4 Uptake strategy and actions

4.1 Introduction

The objectives of task T6.3 is to ensure demonstration of services integrated into EOSC as well as the understanding of the EOSC policies, FAIR best practices, access and usage policies, etc by the stakeholders. The implementation of this task is expected to be via face-to-face communication with the user communities on the national level, organization of seminars and webinars where user communities will be invited to join and distribution either electronically or on paper of the related information. In addition, the production of basic guidelines on the usage of the EOSC, including access as well as explaining FAIR principles and basic policies on publishing literature, data, software, workflows etc., is considered to be essential to fulfil the goal.

4.2 Basic guidelines and recommendations

Guidelines and recommendations for the scope of EOSC and FAIR uptake in communities can be provided on two levels, namely at national as well as at stakeholder level. A description of these two approaches is provided below.

4.2.1 Uptake at the national level

4.2.1.1 Create awareness on the national level – EOSC Promoters

Engagement of stakeholders is essential for the implementation of the EOSC vision. The crucial point is on one hand the identification of the needs of different relevant stakeholders and on the other hand to find the most appropriate way to provide all the necessary information and training according to their level of knowledge on the issue. It can be described as a great challenge since many Member States are not familiar with the foundations of Open Science or haven't established any policies or infrastructures for the support of researchers, funders etc; this is clear from the results of the survey stakeholder provided in the previous section.

For addressing this information and knowledge gap, awareness raising activities need to take place. Direct communication and an active network of Open Science actors can play a crucial role in supporting the breakthrough of EOSC and FAIR in the region. For this reason, NI4OS-Europe has set up a network of people active in Open Science who will act as the Open Science, EOSC, FAIR ambassadors at national level. To choose these people a list of criteria has been set so that the EOSC promoters meet these requirements. The list of criteria is listed below.

Criteria set:

- The EOSC promoter should have an extended knowledge on Open Science, Open Access, FAIR principles etc.
- She/he could be able to contact and provide useful support to all different stakeholder profiles – supported by the partner organizations.

- The EOSC promoter should have a role with high visibility in the relevant country which could enable her/him to contact stakeholders.
- She/he should be involved in related initiatives.
- The EOSC promoter should have good communication skills and proven ability to communicate to small as well as to large audiences.
- The EOSC promoter should participate in all train-the-trainers events which will be organized by the NI4OS-Europe consortium.

It is expected that all the EOSC promoters are people who have visibility at national level and are able to engage the community; thus acting like ambassadors for EOSC and FAIR. Further training of the promoters might be needed. For this purpose, and as it has already been stated above, all the EOSC promoters would be participating in train-the-trainers' events which will be hosted by particular NI4OS-Europe partners. The detailed schedule of the train-the-trainers events will be presented in the deliverable D6.2. The EOSC-promoters would, thus, receive additional training in topics such as, FAIR, National EOSC promotion, ORDM and onboarding of services.

Who are the EOSC promoters

NI4OS-Europe partners were called to provide their input regarding people that have the knowledge and will be able to perform the role of EOSC promoter. In the table below the names given are provided. People proposed are expected to be knowledgeable in order to make sure that they meet the transmission of knowledge to EOSC and further aspects of Open Science (knowledge on Open Science, Open Access, FAIR principles etc.) and that they will be able to play this key role in the scope of our project. The task of EOSC promoters will be to ensure demonstration of services integrated into EOSC as well as the understanding of the EOSC policies, FAIR best practices, access and usage policies, etc.

Country	EOSC Promoter
Greece	Zoe Cournia
Cyprus	Sylvia Koukounidou/Chrysovalantis Constantinou
Bulgaria	Todor Gurov
Croatia	Bojan Macan/Drazenko Celjak
Hungary	János Mohácsi
Romania (ICI)	Dragos Catalin Barbu
Slovenia	Dunja Legat
Serbia	Milica Sevkusic
Albania	Bernard Zeneli
Bosnia-Herzegovina	Mihajlo Savic
North Macedonia	Sonja Filiposka
Montenegro	Lidija Milosavljevic
Republic of Moldova	Țurcan Nelly
Armenia	Shushanik Sargsyan
Georgia	Tamara Gvenetadze

Table 3. The names of the NI4OS-Europe's EOSC Promoters

4.2.1.2 Remove language barriers - Translation officers

As in several other cases, language can be a barrier also in the implementation of EOSC and the establishment of Open Science and FAIR principles in the partner countries of South Eastern Europe. Removing language barriers is especially important in case of activities where policies, guidelines, glossaries, training material, or similar documents need to be used, adopted or generated. NI4OS-Europe therefore decided to assign in each partner country a translation officer, who will be responsible to translate documents that play a central role in the setting up of National Open Science Cloud Initiatives and in the promotion of EOSC and FAIR. The list of translation officers is shown in the table below.

Country	Translation Officer
Greece	Evangelia Athanasaki
Cyprus	Chrysovalantis Constantinou
Bulgaria	Nedu Karaivanov
Croatia	Kristina Posavec/Lovorka Caja
Hungary	Csilla Gödri
Romania	Ella Ciuperca
Slovenia	Brina Klemenčič
Serbia	Milica Sevkusic
Albania	Bernard Zeneli
Bosnia-Herzegovina	Mihajlo Savic
North Macedonia	Bojana Koteska
Montenegro	Enis Kočan
Republic of Moldova	Natalia Cherady
Armenia	Naira Kocharyan
Georgia	Tamara Gvenetadze

Table 4. The names of the NI4OS-Europe translation officers.

Quality Check

To assure the exact translation of each document from English to the mother tongue of each partner state, the translation officers are responsible to share their documents with the partners within the relevant country. After the quality check, the documents should be returned back to the translation officers who will be responsible for the circulation of the documents to the partner's stakeholders, task leaders, work package leaders, etc.

4.2.2 Uptake based on stakeholder types

Although the survey results have not yet been analysed in all their aspects, the preliminary analysis shows that same stakeholder categories share similar concerns and needs, and express similar requirements towards EOSC, across more or less all countries which participated in the survey. NI4OS-Europe uptake strategy has thus to consider the specific needs and requirements towards EOSC adoption arising from the different stakeholders

involved in Open Science, in parallel to the horizontal country-level presented in the previous section.

a. Understand different needs

Having in mind the different categories of stakeholders, the training needs are expected to be formulated according to the survey findings for each category. Different level of training, and several aspects of Open Science are expected.

b. Work on uptake strategies based on profile

Among the criteria on the uptake strategies will be the stakeholders' profiles. Further analysis of the survey data are expected to provide clear views on the profiles of trainees in order to provide the best possible and focused uptake strategy and avoid unnecessary costs, time and efforts.

c. Possible tools and actions

According to the survey findings the actions that need to be taken will vary and collaborations with other projects or use of existing material will be taken into account. Face-to-face trainings and/or workshops, webinars or teleconferences and work on and support collaboration with other local actors will be some of the uptake actions to communities.

The provision and dissemination of the produced guidelines, position papers, promotional material and any other supporting material or the translated existing material will be another mean to spread the mission and vision of EOSC and all aspects of Open Science.

All the above can and will be used in combination or separately.

5 Collaboration with other projects

5.1 Cooperation with FAIRsFAIR towards the FAIR uptake

FAIRsFAIR - standing for “Fostering Fair Data Practices in Europe” - is a European Commission project under the call H2020-INFRAEOSC-2018-2020 with grant agreement 831558 aiming to supply practical solutions for the use of the FAIR data principles throughout the research data life cycle. Within this project emphasis is given on fostering FAIR data culture and the uptake of good practices in making data FAIR. Thus, FAIRsFAIR is expected to play a key role in the development of global standards for FAIR certification of repositories and the data within them contributing to those policies and practices that will turn the EOSC program into a functioning infrastructure.

FAIRsFAIR will also provide a platform for using and implementing the FAIR principles in the day-to-day work of European research data providers and repositories. FAIRsFAIR will also deliver essential FAIR dimensions of the Rules of Participation (RoP) and regulatory compliance for participation in the EOSC. The EOSC governance structure will use these FAIR aligned RoPs to establish whether components of the infrastructure function in a FAIR manner.

It is thus clear that FAIRsFAIR is the scheme which will support the FAIR uptake for the whole Europe within the framework of the European Open Science Cloud. It would be therefore important for NI4OS-Europe to establish connection with FAIRsFAIR and directly collaborate towards the uptake of FAIR. With such a collaboration both projects could benefit and increase their potential to the overall uptake. In this framework the projects have already signed a Memorandum of Understanding, including also other projects discussed below.

NI4OS-Europe has initiated a direct communication with the project coordinator and the Work-Package 6 leader of FAIRsFAIR. WP6 of FAIRsFAIR is dealing with FAIR Competence Center and focuses on FAIR uptake - it is thus very relevant to the related NI4OS-Europe activities. The key tasks of this work package are: the support of communities in their activities aimed at FAIR data uptake and compliance, the promotion and coordination of efforts across communities, identifying opportunities for synergies and building on the progress of others, and finally receiving feedback from communities into other parts of the FAIRsFAIR project and the EOSC in generally.

Although both projects are in their beginnings, and not much has yet been organized for the FAIR uptake, a number of possible collaboration tasks have been identified with the possibility of them taking a more concrete form in the future steps of the NI4OS-Europe project.

An important aspect of NI4OS-Europe is the appointment of the translation officers. FAIRsFAIR is recognizing the importance of being heard by all possible audiences all across Europe. Therefore, material which will be produced by FAIRsFAIR towards FAIR principles and other related topics could be channeled also through NI4OS-Europe towards

the local FAIR uptake. NI4OS-Europe could subsequently proceed towards the translation of these documents to the local tongues and then link these materials to FAIRsFAIR. This will help both projects to achieve economies of scale in terms of effort that need to be invested in the production of training material, and will allow to avoid duplication of work. Furthermore, another aspect in which both projects could collaborate is the organization of training events. FAIRsFAIR is willing to provide trainers on topics related to FAIR and ORDM to participate in training events organised by NI4OS-Europe. As a matter of fact, in the first train-the-trainer event which is focusing on "FAIR principles" and scheduled to take place on the 17th of January by the University of Debrecen, two of the trainers are data management experts coming from DANS which is participating in the FAIRsFAIR. Additional options have been also discussed, such as the organisation of a joint workshop in 2020 or 2021 on topics related to FAIR uptake.

4.2. Cooperation with other INFRAEOSC-5b projects

In addition to an initiative for an independent collaboration between NI4OS-Europe and FAIRsFAIR, a coordinated effort for the collaboration between FAIRsFAIR and all INFRAEOSC-5b projects has been initiated by the EC. The idea is to bring together the following projects to collaborate in a series of topics.

- **EOSC-Nordic** aims to facilitate the coordination of EOSC relevant initiatives within the Nordic and Baltic countries. The project aims to exploit synergies to achieve greater harmonisation at policy and service provisioning across these countries, in compliance with EOSC agreed standards and practices.
- **EOSC-Pillar** will coordinate national Open Science efforts across Austria, Belgium, France, Germany and Italy, and ensure their contribution and readiness for the implementation of the European Open Science Cloud (EOSC). The work of EOSC-Pillar is comprised of seven parts with majority working on a national and transnational level.
- **EOSC-synergy** will contribute to the European Open Science Cloud landscape by expanding the capabilities and building the capabilities of EOSC. In practice, this will mean more compute and storage available to researchers, and more datasets and tools to expand avenues of research. The ultimate goal is to build EOSC as a coordinated effort, as an open environment for scientific data and related processing that promotes convergence of infrastructures and scientific thematic services provided at national or European level.
- **ExPaNDS** is a federation of 10 European national Photon and Neutron research infrastructures, and the e-infrastructure EGI. The goal of the project is to set-up a platform for data analysis, as a service for users from research institutes, universities, industry, etc, thus enabling EOSC services, and providing coherent FAIR data services to the scientific users of PaN sources. In the frame of ExPaNDS, partners will maintain and develop a catalogue of data and analysis software for PaN data, and will cooperate with the EOSC governance bodies to further improve the EOSC. Sharing and

exchanging the benefits of ExPaNDS with other clusters connected to the EOSC is also an activity of key importance.

- **NI4OS-Europe** has as an overall objective to support the development and inclusion of the national Open Science Cloud initiatives in 15 Member States and Associated Countries in the overall scheme of EOSC governance; spread the EOSC and FAIR principles in the community and train it; and provide technical and policy support in on-boarding of the existing and future service providers into EOSC, including generic services (compute, data storage, data management), thematic (domain-specific) services, repositories and data sets – thus introducing new services that cover the whole spectrum of services related to Open Science, data and publications.

From the short description of each project above it is clear that all INFRAEOSC-5b projects share similar views on the FAIR uptake. Obviously ExPaNDS is more thematic oriented but still there will be an important effort of imposing FAIR principles in the user communities of Photon and Neutron research infrastructure.

Therefore, a coordinated effort led by EOSC secretariat, namely the FAIR synchronisation task, is bringing the five INFRAEOSC-5b projects together with FAIRsFAIR and provides a stage for collaboration and common actions towards the uptake of FAIR in the whole European region. The WP6 leader and T6.1 leader have decided to work on the following activities:

1. Review and standardization of FAIR policies in order to enable FAIR-aligned services and repositories;
2. Analysis of FAIR guidelines and standards to enable adoption in the light of the local and disciplinary context;
3. Evaluation and development of FAIR technical aspects including metadata frameworks, interoperability, service infrastructure, FAIR software;
4. Assessment, extension or establishment of FAIR certification schemes for repositories and services. The uptake in communities and on national levels is of special importance;
5. Development and adaptation of FAIR assessment tools. These tools include, but are not limited to, DMPs, licenses and datasets.

In addition, further actions will be taken towards training on FAIR topics. Such tasks will be coordinated by the common task force dealing with training aspects.

6 Conclusions

This deliverable captures the main activities of Task 6.3 “Support to EOSC service uptake and FAIR uptake in communities”, and provides the implementation plan for the EOSC service uptake and FAIR uptake in the communities.

The information selected with the aid of the stakeholders’ survey is and will be further used in several ways.

This will enable the identification and development of all necessary procedures and material in order to raise awareness on topics regarding EOSC and FAIRness to the user communities of each country, with the assistance of EOSC promoters and translation officers identified by partners.

Guidelines and recommendations of task 6.3 are aiming at supporting the NI4OS-Europe work to promote EOSC and FAIR and establish sustainable national open science cloud initiatives. The stakeholders’ analysis through the survey findings will provide the necessary information which will be presented in D2.1.

This is expected to assure that demonstration of services integrated into EOSC as well as the understanding of the EOSC policies, FAIR best practices, access and usage policies, etc will be focused to interested and specified communities.

NI4OS-Europe is one the INFRAEOSC-5b projects supporting the EOSC uptake on a regional level. The close collaboration with the other related projects is expected to form a Europe-wide community of EOSC promoters and users, and, thus, turn EOSC into a reality.