



EOSC-hub

Evaluation of the EOSC-hub community Issue: June 2020

Abstract

This document provides a snapshot about the communities that have been engaged by the EOSC-hub project until the end of June 2020. The document presents our assessment of the engaged EOSC service provider and user communities from different perspectives, including engagement instruments used, scientific discipline coverage and nationality/regional diversity. Based on these findings the report provides a set of recommendations for EOSC-hub and for other projects of the EOSC landscape on how to strengthen and focus community engagement activities.

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TERMINOLOGY

<https://wiki.eosc-hub.eu/display/EOSC/EOSC-hub+Glossary>

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1. Introduction

The EOSC-hub project operates many of the core elements of the European Open Science Cloud, and acts as the main facilitator of onboarding new providers and new users and communities in EOSC via the EOSC Portal. Task 3.2 of EOSC-hub is responsible for community engagement. Task 3.2 provides oversight of engagement work with communities that are already represented in the consortium within other WPs, and does proactive engagement with new communities who we need to engage with for a successful EOSC. This proactive engagement uses various instruments that the project setup in the past 2 years.

This document provides a snapshot about the communities that have been engaged by EOSC-hub until the end of June 2020, with the ultimate goal to support engagement activities for the rest of the project (expected finish at the end of March 2021). In the document we perform assessment of the service providers and users who visited and used the EOSC Portal and we provide recommendations that can help EOSC-hub and other EOSC projects strengthen community engagement in the next period. Data for this report was pulled together by the T3.2 team from

- EOSC-hub WP7 and WP8 WPs (Thematic services and Competence centres)
- JIRA project used to track service onboarding via the EOSC Portal
- Early adopter programme applications (an EOSC-hub instrument)
- EOSC-hub Stakeholder Database (tracking early adoptions and engagements at events)
- EOSC-hub Strategy board membership
- JIRA project used to track service orders (service access requests via the EOSC Portal)

Our assessment covers engagement with 163 communities, reached with the following instruments:

- **Competence centres:** WP8 includes 8 competence centres (CCs) since the start of the project. These CCs link to 10 research infrastructure communities. These communities carry out technology and service assessment activities with the ultimate goal of setting up new 'thematic services' designed for specific research infrastructure communities.
- **Thematic services:** WP7 includes 9 Thematic Service provider communities since the start of the project. These 9 communities deliver science discipline specific services to researchers via the EOSC-hub channels, and gradually expand the functionality of these services by integrating them with generic e-infrastructure and access enabling services of the project.
- **Service providers onboarded:** Communities/institutes can apply to become service providers in EOSC since November 2018, when the EOSC Portal was launched. The EOSC-hub project onboarded 43 new communities until now. (There have been over 90 services added to EOSC by EOSC-hub in total. Approximately half of those come from members of the consortium, the other half comes from these 43 newly engaged providers.)
- **Early adopter Programme pilots (EaP):** The project launched two calls for 'Early adopters' in 2019. The selected Early adopters receive technical support and infrastructure services with capacity from the project to integrate science discipline specific use cases and applications into EOSC. 13 EaPs have been selected: 5 in the 1st and 8 in the 2nd call.
- **Direct engagement:** The project continuously seeks for external stakeholders that we should engage with, and we either contact them directly, or meet them at events. There have been

23 of such engagements since the start of the project, many ending up in active collaboration (e.g. as providers, or applicants in the EaP). There are **5** communities at the moment in our direct engagement pipeline. Initial discussion took place with these communities, and we are in the process of further discussing collaboration and eventually moving them into becoming service users, providers, supporters. (Several already onboarded service provider and user also started with 'event engagement')

- **Strategy board:** The project runs a strategy board where the **5** ESFRI Cluster projects have 1-1 representatives. This arrangement is also considered as a form of engagement and is included in our assessment.
- **Users via the Marketplace:** Until the time of writing **142** unique users submitted **331 access requests** in total via the EOSC-hub Marketplace that is linked to the EOSC Portal. Despite the engagement with such users is a much lighter type of engagement than any of the above described ones, we still consider it as a useful input to our landscape analysis.

2. Analysis of long-term engagement

In this section we look at the communities that have been engaged with the long term engagement instruments, i.e. considering all the instruments, but the 'Users via the Marketplace'. There are 85 communities considered in this analysis.

2.1 Analysis by the engagement instrument

The following pie chart shows the split of communities by engagement instrument, considering the long term engagement instruments (i.e. all but the 'Users via the Marketplace'):

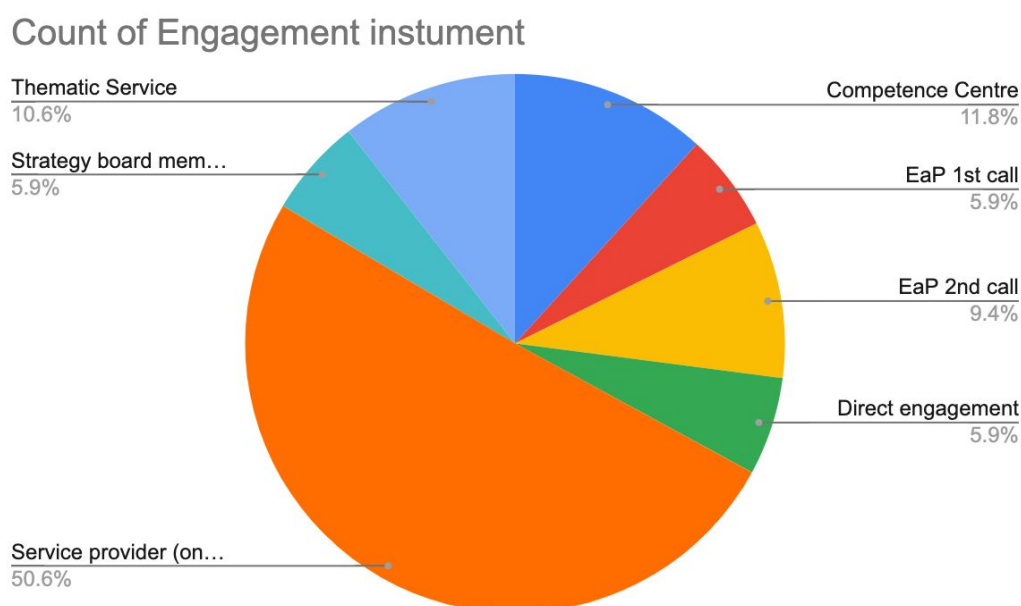


Fig 1. Classification of engaged communities by the Type of engagement instruments we used

From the chart it can be observed that:

- the Service provider engagement became the main instrument, nearly outweighing all other instruments together.
- The pace at which services are onboarded shows an increasing trend, so we will see an even stronger dominance of service provider onboarding by the end of 2020. The event engagement shows a small number, but only because it reflects the number of communities who are currently considered as 'contacts we made an external event'. Many of the communities who signed up as service providers or became users or applicants of EaP pilot also encountered EOSC-hub via an event - so this engagement instrument is still impactful despite its share of the pie.
- We think that the Early adopter Programme can be also considered a success, because we received 12 responses to the 1st, 15 responses to the 2nd call.
- While direct engagement was a successful way to lead new institutes and communities to the EOSC Portal, the opportunity for new meetings was dropped to nearly zero in 2020 due to the COVID situation.

2.1 Analysis by stakeholder role

Figure 2 shows the classification of engaged communities by the role they play in the EOSC-hub landscape. We distinguish user communities (users of the generic services), provider communities (meaning from academia), providers from industry, communities that play a dual role (they consume generic services and provide thematic services), and strategy board members. The main messages from this analysis:

1. The project onboarded already 12 providers from industry.
2. ~2/3rd of the engaged communities act as providers. (Green, Yellow and Red slices) This is in sync with the previous figure. (because the Service Providers, Thematic Services, some of the CCs and some of the EaP pilots are also acting as providers)
3. The user communities slice on this diagram does not show the complete picture of service usage, because we do not consider the 'simple' users who do not play other roles, but access or order services via the EOSC Portal. There were 331 orders until now (more than the whole pie), and there are expected to be many more service accesses (i.e. access to fully open access services where there is no need for ordering.)

Count of Main role in EOSC-hub

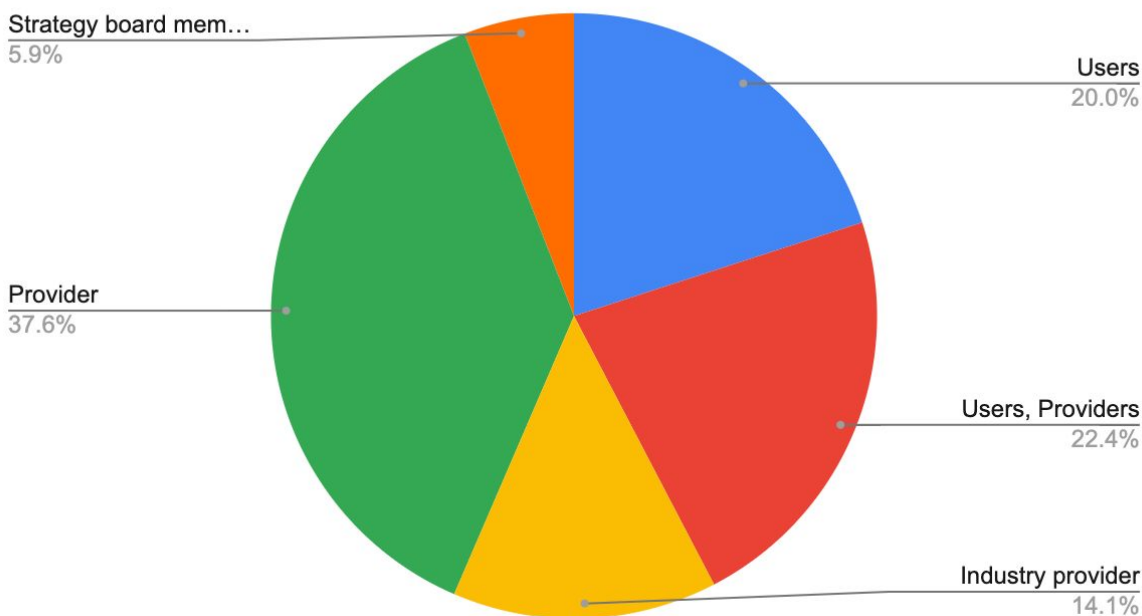


Fig 2. Classification of engaged communities by the role they play in/with the project

2.2 Analysis by geographical type

Our next analysis looked at the classification of engaged communities by their geographical footprint. We used the following options:

- Global: The community has members from Europe and elsewhere
- European: The community has a dominant presence in Europe. ESFRIs are typical examples.
- Multi-national: The community has presence in several European countries, but without a major goal to expand its footprint.
- National: The community/stakeholder is present in one country.

The data confirms the focus of EOSC-hub on international/multi-national communities, however there is already a good share of approx 25% by national communities. We expect this share to grow gradually by the end of the project as a result of onboarding of new providers by the national EOSC projects (funded under the INFRAEOSC05b call). Our current analysis does not go into the level of where the national communities so far came from - because we expect a dynamic change in this picture. (We provide an analysis of the nationality of users later.)

Count of Geographical type

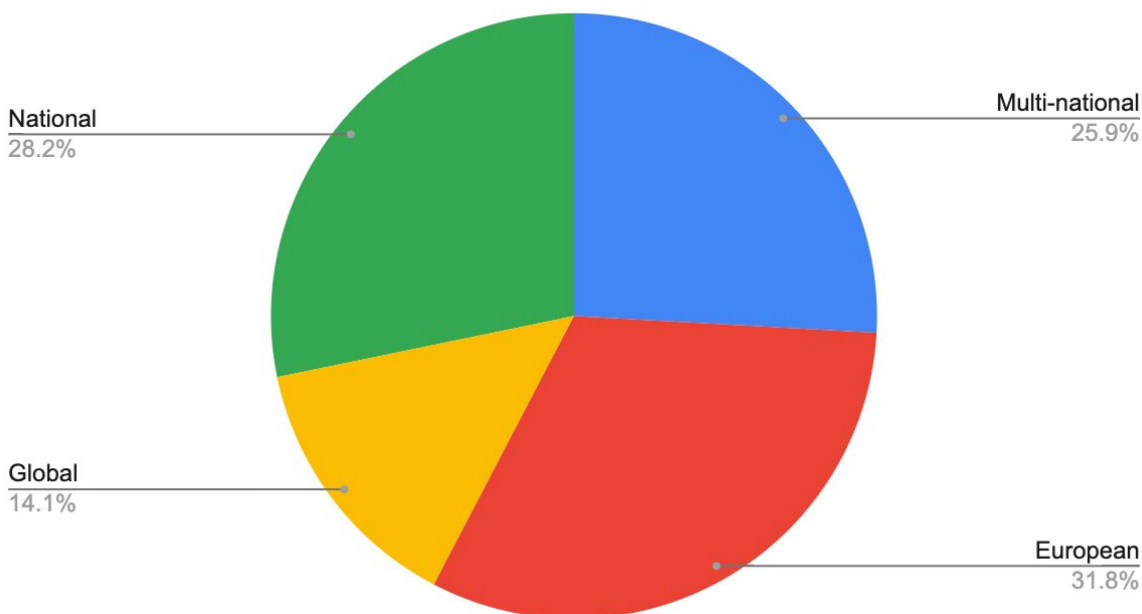


Fig 3. Classification of engaged communities by their geographical footprint

2.3 Analysis of science discipline distribution

We believe that the most important analysis of our community engagement is by the scientific disciplines. We used the “REVISED FIELD OF SCIENCE AND TECHNOLOGY (FOS) CLASSIFICATION IN THE FRASCATI MANUAL”¹ to classify the engaged communities by their science discipline. This classification scheme is the basis of classification used by EGI and EUDAT. We used the classification up to 2 levels. The 1st level classification is shown in Fig 4.

¹ <http://unstats.un.org/unsd/EconStatKB/Attachment332.aspx?AttachmentType=1>

Count of Discipline 1st level

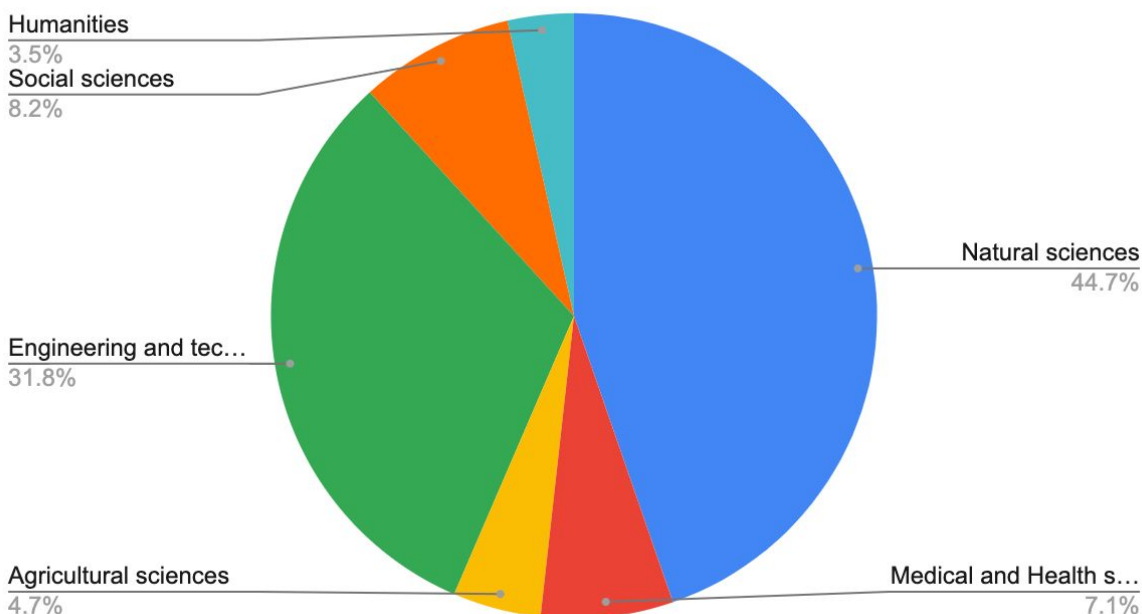


Fig 4. Classification of engaged communities by their science discipline (1st level)

From the pie we can observe that:

- Natural sciences dominate (38 communities): This is due to the fact that the classification we used pulls physical, chemical, earth, biological sciences under a single top level class. Because of this we zoom into this slice in the next diagram and its related analysis.
- The 'engineering and technology' domain has a big share (27 communities): This is because generic services (such as HTC, cloud, data management) have no better place to be in the Frascati classification we used and also because the EOSC-hub consortium is dominated by such providers.
- 'Medical and Health' have 'only' 6 communities. This is because under the 'Natural sciences' there is also a 'Biological sciences' subdiscipline with 7 entries, so these two should be considered together, resulting in 13 entries. (See subdisciplines later)
- Social sciences and humanities have 7+3 communities together. This is an area where EOSC-hub should probably increase its outreach.

Our next analysis (Fig 5) goes into the details of the Natural sciences discipline (following the classification schema we chose - See above). From this pic chart we can observe:

- A big dominance of earth science communities (18) is due to the fact that the TSs and CCs have a very high number from this domain. There were only a few that joined later, as EaP pilot or as service provider via the EOSC Portal.
- A significant presence of physics science communities (7), is due to the fact that EOSC-hub has a strong drive by EGI and EUDAT, two e-infrastructures that are heavily used by physics communities.

- The 7 'Biological sciences' communities complement the 6 'Medical and Health sciences' communities from Fig 4.

Natural sciences communities per sub-discipline

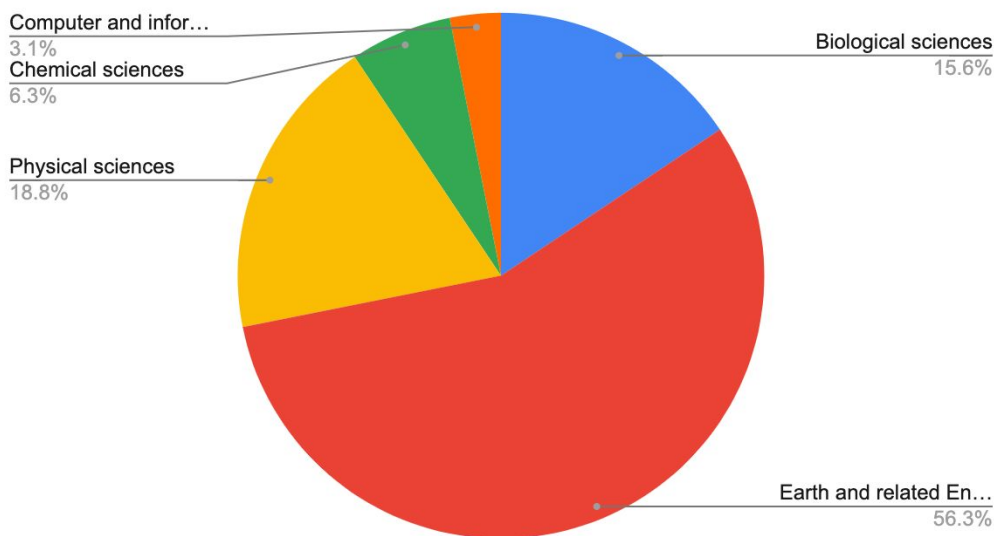


Fig 5. Classification of Natural science communities by their 2nd level discipline

3. User analysis

3.1 Visitor analysis

Our next analysis looks at the visits in the EOSC Portal and Marketplace, and at the service access requests (alias 'orders') from the EOSC Marketplace. On Fig 6 we present the monthly visits on the EOSC Portal and on the Marketplace, on Fig 7 the number of service access orders received each month via the Marketplace.

The graphs on Fig 6 shows that the visits dropped after the initial opening of the EOSC Portal and Marketplace (understandably), and since January 2019 there is an increasing trend, with more visits in spring and autumn, and less during the winter and summer holidays. There is a peak in May 2020, which is due to the interest for EOSC Portal during the EOSC-hub week. By looking at the trend so far, we'd expect that the number of visits will reach 5,000/month on the Portal and 1,500/month on the EOSC Marketplace by the end of 2020.

From Fig 7 we observe that there is no clear trend in the number of orders, although there seems to be a slight increase in the numbers overall. The holiday periods (summer and winter) show drops, and there is a peak in July 2019 when a large number of orders have been received from Korea from a single user (who turned out to be only testing the Marketplace). The relatively big increase of Jan-April 2020 is most likely because of the Early Adopter Pilots that became active in those months (and were requested by EOSC-hub to use the EOSC Portal as a channel to request services).

Number of visitors on EOSC Portal (blue) and Marketplace (red)

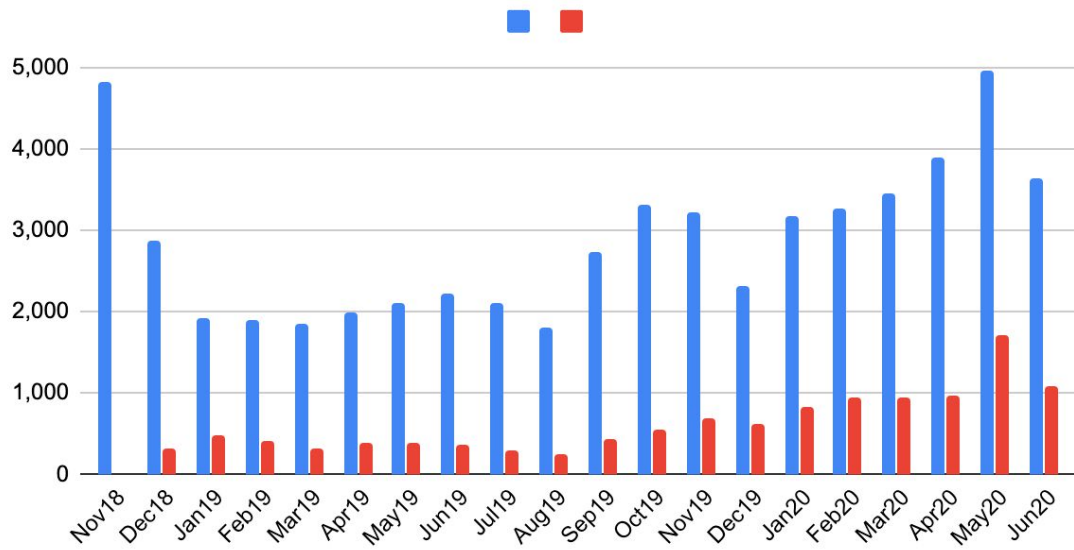


Fig 6. Number of visits on the EOSC Portal and Marketplace per month

Number of orders via the Marketplace

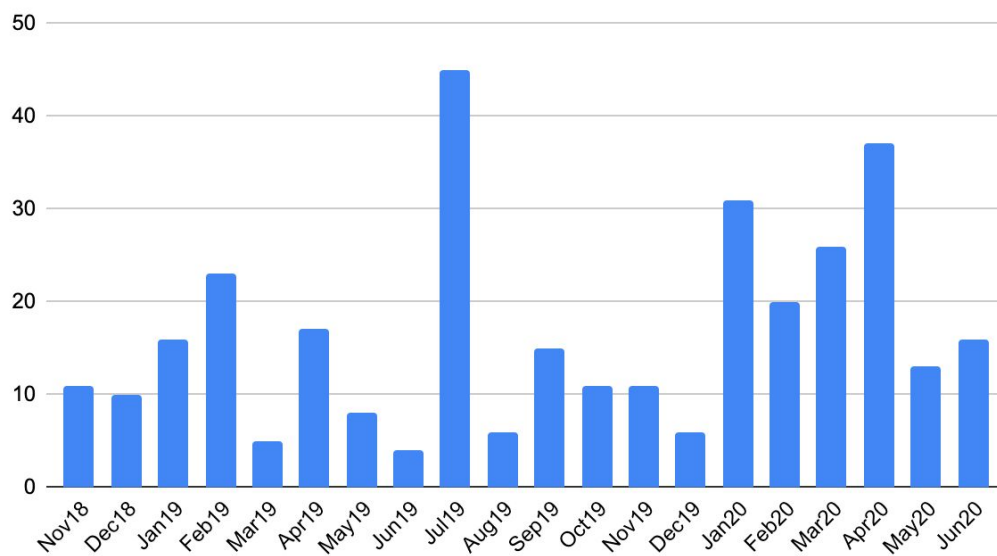


Fig 7. Number of service access orders received via the Marketplace per month

3.2 Order analysis

Table 1 below presents details about the received service orders². The data is shown in two columns: Total number of orders, and total number of users who submitted those orders. This distinction is important because - as it can be seen from the data - some users submitted multiple orders. While sometimes multiple orders make sense (when e.g. a storage service and a compute service are requested in one transaction), in other cases the orders are mistakes, misunderstanding, tests or violation of policies (quite visibly from Korea).

The main observations are:

- There was 1 Korean user who submitted a lot of requests just for testing purposes.
- Germany, UK, Poland and France are the most active (we ignore Korea for the reason above). This inline with their proportion of population.
- Considering EU members and associated countries we did not receive any access request from: Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Estonia, Ireland, Latvia, Lithuania, Luxembourg, Malta, Montenegro, FYR of Macedonia, Romania, Serbia, Slovakia, Turkey. → The project should definitely strengthen outreach towards these countries (See section 4 for details on how to do this.)
- There are an additional 92 orders where the country field was not filled. (An improvement request was sent to the Marketplace development team to make the country compulsory to fill. It may be possible to import this from the user's IdP.)

Table 1. Origin of service access requests (orders in the EOSC-hub Marketplace)

User's country	Total orders	Unique users
Albania	2	1
Armenia	2	1
Australia	2	2
Austria	5	4
Belgium	1	1
Brazil	1	1
Czech Republic	1	1
Denmark	4	2
EU projects	10	6
Finland	3	3
France	28	9

² Orders can be received via the Marketplace from those services that require the user to request access to the service. The EOSC Portal and Marketplace include fully open access services too, where the user can simply access the service without ordering it. Those open accesses are not tracked at the moment. EOSC-hub and EOSC Enhance are working on the tracking of the number of 'click-throughs' from the EOSC Marketplace to the websites of the open access services. Although not all the click-throughs result in actual use of an open access service, the number of click-throughs would at least give indication of user interest.

Germany	43	28
Greece	2	2
Hungary	3	3
Italy	11	7
Korea	52	2
Netherlands	5	3
Poland	14	8
Portugal	1	1
Slovenia	2	1
Spain	7	5
Sweden	7	5
Switzerland	8	3
Ukraine	6	1
United Kingdom	19	10
TOTAL FROM KNOWN COUNTRIES	239	110

Table 2 below provides an analysis of European countries with at least one order. The analysis shows how well (or badly) each country performs in ordering with respect to the European average. We calculated the European average by summing up all the European orders from Table 1 (176), and dividing it with the population of Europe (741 million - taken from Wikipedia³). This results in 1 order per 4.2 million people.

The 3rd column of the table shows the number of orders that have been received from that country. The 4th column shows the expected number of orders from that country, which is calculated as:

$$(1 \text{ order} / 4.2 \text{ million people}) * \text{Country population}$$

We use colour coding in the last column to indicate which country is below its expected number (RED), and which one is above the expected number (GREEN). Outreach to potential users should be strengthened in those countries that have RED numbers.

³ <https://en.wikipedia.org/wiki/Europe>

Table 2. Number of orders proportional to country population. The table is using the following baseline: There were 176 European orders so far, with Europe having a population of 741 million → There was 1 order per 4.2 million people.

Country	Population (in million)	Number of orders received from that country	Expected number of orders based on the European average
Albania	2,8	2	0,6
Austria	8,8	5	2
Belgium	11	1	2,49
Czech Republic	10,69	1	2,54
Denmark	5,8	4	1,38
Finland	5,5	3	1,3
France	66	28	16
Germany	83	43	20
Greece	10,72	2	2,55
Hungary	9,77	3	2,27
Italy	60,36	11	14,37
Netherlands	17,28	5	4,11
Poland	37,97	14	9,04
Portugal	10,28	1	2,44
Slovenia	2	2	0,47
Spain	46,94	7	11,18
Sweden	10,23	7	2,43
Switzerland	8,57	8	2,04
Ukraine	41,98	6	9,995
United Kingdom	66,65	19	15,87

4. Gap analysis and recommendations

Because conferences and travel in general is still impacted and unpredictable due to the COVID situation, EOSC-hub should rely on existing projects, networks and on online events to reach new communities. Based on the data that have been presented in Section 1-3 of this report, we make the following recommendations on how to broaden engagement in certain disciplines and certain countries:

1. Focus collaboration with EOSC projects:
 - Table 3 lists EOSC projects (data from <https://www.eosc-portal.eu/about/eosc-projects>) that EOSC-hub should work with to engage with certain disciplines and specific countries. EOSC-hub should work with these projects to increase the number of providers and users from these disciplines and countries. Table 1 and 2 pointed out the European countries from which EOSC did not service service access requests so far, or received less requests than the European average. EOSC-hub should work with the INFRAEOSC05b projects to increase reach within the following countries:
 - NI4OS-Europe:
 - No orders: Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Montenegro, FYR of Macedonia, Romania, Serbia, Turkey
 - Less than average orders: Greece
 - EOSC-Synergy:
 - No orders: Slovakia
 - Less than average orders: Czech Republic, Portugal, Spain
 - EOSC-Pillar:
 - Less than average orders: Italy
 - EOSC-Nordic:
 - No orders: Estonia, Latvia, Lithuania
 - Ireland, Luxembourg, Malta (countries without orders)
 - Ukraine (countries with less than average orders)

EOSC-hub has a database with the attendees from the EOSC-hub week. We should use this to identify and engage with contacts from these countries.

3. Disciplinary events:
 - Table 4 shows the number of services that are available in the EOSC Portal from the different disciplines of the Frascati scheme that we used in this report. The table also provides information about upcoming conferences that we found for the various disciplines. These conferences, as well as the conferences/workshops organised by EOSC projects within disciplines with low number of providers should be in the focus of EOSC-hub to increase the disciplinary reach.
4. Despite the number of services in the EOSC Marketplace is continuously growing, the number of orders submitted via the Marketplace does not show a clear increase. This may

be an indication that the service offer via the EOSC Portal and Marketplace is still not attractive enough for users, or can be because we are missing statistics on the use of fully open access services.

- The project should increase the speed at which services are published and should work more closely with service providers and provider projects to feed new services into the service onboarding pipeline. The recently published 'EOSC-hub Integration handbook for service providers'⁴ is also expected to speed up this process.
 - EOSC-hub and EOSC-Synergy started to work on counting the number of 'click-throughs' from the EOSC Marketplace to the websites of the open access services. Although not all the click-throughs result in actual use of an open access service, the number of click-throughs would at least give indication of user interest and could be included in the next issue of this report.
5. Travel and conferences are expected to be limited for the next 6 months, therefore EOSC-hub should strengthen its online outreach. A webinar programme would be a promising solution for this and should be launched with online events from September. Besides covering EOSC-hub topics the programme could also feature guest speakers from partner projects, strengthening the relationship between multiple initiatives.

Table 3. Mapping of EOSC projects to countries and disciplines

Project	Involved countries	Covered disciplines
EOSC-Pillar	Austria, Belgium, France, Germany, Italy.	Open Science, FAIR data principles, development of common policies and tools.
EOSC-Nordic	Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Netherlands, Norway, Sweden.	
EOSC-Synergy	Czechia, France, Germany, Netherlands, Poland, Portugal, Slovakia, Spain, United Kingdom	Environment, Climate Change, Earth Observation and Life Sciences. Open Science and Open Data.
NI4OS-Europe	Albania, Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Greece, Hungary, Moldova, Montenegro, North Macedonia, Romania, Serbia, Slovenia.	Open Science, Open Data, Open Science Policy
BE-OPEN	Belgium, Cyprus, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Spain.	Transport Research (civil engineering)

⁴ EOSC-hub Integration handbook for service providers: <https://doi.org/10.5281/zenodo.3826907>

Cos4Cloud	Colombia, France, Germany, Greece, Netherlands, Spain, Sweden, United Kingdom	Citizen observation of Biodiversity, Environmental Monitoring, Environmental Sciences.
FAIR4Fusion	France, Germany, Greece, Poland, Switzerland, United Kingdom.	Fusion Physics.
FAIRplus	Belgium, France, Germany, Luxembourg, Netherlands, Spain, Sweden, Switzerland, United Kingdom.	Life Sciences, Pharma.
FAIR4Health	Austria, Belgium, Germany, Italy, Netherlands, Portugal, Serbia, Spain, Switzerland, Turkey, United Kingdom.	Health Sciences, Life Sciences, Health research and routine care data, data sciences.
FNS-Cloud	Austria, Belgium, Bulgaria, Denmark, Germany, Greece, Ireland, Italy, Netherlands, Serbia, Slovenia, Spain, Switzerland, United Kingdom.	Food and Nutrition Sciences, Agri-food sciences.
ICEDIG	Belgium, Estonia, Finland, France, Netherlands, Switzerland, United Kingdom.	Scientific Collections, Biodiversity
NEANIAS	France, Germany, Greece, Hungary, Italy, Luxembourg, Portugal, Spain, United Kingdom.	Underwater Environmental Sciences, Atmospheric Environmental Sciences, Space and Astrology.
EOSC-Life	Austria, Belgium, Czechia, Finland, France, Germany, Greece, Italy, Netherlands, Portugal, Slovenia, Spain, United Kingdom.	Life Sciences, Biological and Medical research.
PaNOSC	Belgium, France, Germany, Italy, Netherlands, Sweden.	Particle Sciences, Photon and Neutron Sciences. FAIR data.
ESCAPE	Belgium, France, Germany, Italy, Netherlands, Spain, Switzerland, United Kingdom.	Astronomy, Infrared Astronomy, Particle Physics. Software Development.
SSHOC	Austria, Belgium, France, Germany, Greece, Italy, Netherlands, Norway, United Kingdom.	Social sciences and humanities, data silo/warehouse, Interoperability (of FAIR).
ENVRI-FAIR	Austria, Belgium, Finland, France, Germany, Italy, Netherlands, Norway, Romania, Serbia, Spain, Sweden, United Kingdom.	Environmental sciences, FAIR principles.

Table 4. Gap analysis: Disciplines with engaged communities vs. non-engagement

LEVEL 1	LEVEL 2	COUNT	CONFERENCES
1. Natural sciences	1.1 Mathematics	0	
	1.2 Computer and information sciences	1	
	1.3 Physical sciences	8	
	1.4 Chemical sciences	2	
	1.5 Earth and related Environmental sciences	18	
	1.6 Biological sciences	7	
	1.7 Other natural sciences	0	
	Total	36	
2. Engineering and Technology	2.1 Civil Engineering	0	
	2.2 Electrical engineering, Electronic engineering, Information engineering	1	
	2.3 Mechanical engineering	0	
	2.4 Chemical engineering	0	
	2.5 Materials engineering	0	
	2.6 Medical engineering	0	
	2.7 Environmental engineering	1	
	2.8 Environmental biotechnology	0	
	2.9 Industrial biotechnology	0	
	2.10 Nano-technology	0	
	2.11 Other engineering and technologies	21	
Total	23		
3. Medical and Health	3.1 Basic medicine	4	
	3.2 Clinical medicine	0	DGIM2020
	3.3 Health sciences	1	HIMS Healh 2.0

Sciences / Hakan	3.4 Medical biotechnology	0	TERMIS 2020
	3.5 Other medical sciences	1	IEEE International Conference on e-Health and Bioengineering
	Total	6	
4. Agricultural sciences / Sara G	4.1 Agriculture, Forestry, and Fisheries	2	Urban Agriculture 2020
	4.2 Animal and Dairy science	0	ICADS 2020: 14. International Conference on Animal and Dairy Sciences
	4.3 Veterinary science	0	International Conference On Animal Science & Veterinary Medicine
	4.4 Agricultural biotechnology	0	International Conference on Nanobiotechnology for Agriculture
	4.5 Other agricultural sciences	1	The IRES - 831st International Conference on Food and Agricultural Engineering (ICFAE)
	Total	3	
5. Social sciences / Gergely	5.1 Psychology	0	Second Conference on Music and Eye Tracking
	5.2 Economics and Business	0	Business & Economics Society International (B&ESI) 36th Conference
	5.3 Educational sciences	0	Virtual Educa Lisbon 2020
	5.4 Sociology	0	The Environmental Crisis: Culture, Power and the Possibility of Change
	5.5 Law	0	
	5.6 Political science	0	10th Annual Conference of the European Political Science Association
	5.7 Social and economic geography	1	
	5.8 Media and communications	0	IAMCR Beijing 2020
	5.9 Other social sciences	5	Social Studies Conferences (ICS21)
	Total	6	
6. Humanities / Debora	6.1 History and Archaeology	0	World Archeological Congress #9
	6.2 Languages and Literature	1	Conference on Language, Literature, Linguistics and Communication (LLLC) 2020
	6.3 Philosophy, Ethics and Religion	0	The Asian Conference on Ethics, Religion and Philosophy
	6.4 Arts (arts, history of arts, performing arts, music)	0	Fifteenth International Conference on the Arts in Society
	6.5 Other humanities	0	International Conference on Recent Social Studies and Humanities
	Total	1	

