# Analysis of the Financial Sustainability Task Force

Consultation on the Progress report
July 2023
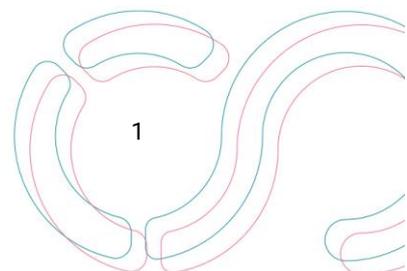
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1. Introduction

The Financial Sustainability Task Force of the EOSC Association (TF FinSust in the following) has consulted with stakeholders of the European Open Science Cloud (EOSC) via a survey. The goal was to obtain feedback on the paths towards financial sustainability of EOSC contained in its Progress Report[2] published in November 2022. The feedback will help the Task Force inform its positioning relative to the discussions on the future of EOSC post-2027, as well as indicate possible directions for the work in the remainder of the TF's current mandate (until the end of September 2023).

Overall, the EOSC stakeholders that responded support the views in the report, with no major opposition to the proposals put forward by the TF. This is consistent with valuable feedback received at other presentations of the Report. We understand the Progress Report thus reflects to a good extent the view of the EOSC community.

The present document is structured as follows: we begin with a description of the scope and methodology employed, including some thoughts on the demographics of respondents. Section 2 summarises the process that led to the consultation; Section 3 explains the methodology followed, and Section 4 contains a summary of the main findings. Finally, Section 5 includes our main conclusions, which will be used as input for the final report of the TF FinSust. The present report has been produced with the intention of providing transparency about the TF's work and our upcoming final report.

2. Background of the consultation

The TF FinSust presented some proposals towards achieving long-term financial sustainability of the EOSC in its Progress Report. The report describes possible paths to ensure the long-term sustainability of the different EOSC components (EOSC-Core, EOSC Exchange and Data Federation) as understood by the members of the TF FinSust[3]. Following publication, the TF engaged in several sessions at different national and international events to present the work and solicit feedback from key members of the EOSC community[4]. As final element in this process, consultation via a survey has given the opportunity to others with a good

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[2] https://doi.org/10.5281/zenodo.7318481

[3] The concept of "EU and thematic nodes" introduced by the European Commission in early 2023 was not covered in the TF Progress Report (published in November 2022), and was therefore not considered in the consultation or its analysis. The TF is now aware of this recent development, and will consider its effects on the long-term financial sustainability of EOSC.

[4] This includes presentations at the ICRI conference, participation in panel discussion with EOSC clusters at 3rd Photon & Neutron EOSC symposium organised by PaNOSC & ExPaNDS (Oct 2022), presentation at PaNOSC Closing Event and 5th general assembly of the EOSC Association MAR breakout session at the EOSC Symposium in November 2022, followed by participation in the e-IRG meeting in December; in 2023, the report was presented and discussed at the EOSC Steering Board webinar in January, and was further presented at Ireland and Dutch National Tripartite Events and the Norwegian national EOSC forum, and at other national and thematic events by TF members.

understanding of the EOSC vision and implementation, to give further feedback and express their ideas about how the financial sustainability of EOSC can best be achieved.

3. Towards financial scenarios for the Core

The questionnaire[5] was prepared by a subgroup of the TF FinSust in late 2022, and conducted using the EUSurvey online survey management tool[6] with support from the EOSC Association. The list of recipients was coordinated between the TF FinSust and the EOSC-Association secretariat, and targeted representatives from stakeholder groups in the EOSC ecosystem deemed key to assess the direction of the TF's work: TF co-chairs, coordinators of Horizon Europe and H2020 INFRAEOSC and other EOSC-related projects, EOSC Steering Board members, Research Infrastructures and ERICs, ESFRI RIs, ESFRI RI Working Group of the EOSC Association, members of staff of the European Commission related to the EOSC Partnership, Mandated Organisations of the EOSC Association, EIROforum members, Representatives of European e-Infrastructures, and H2020 cluster projects. Note that the consultation was sent to targeted organisations only, as explained below, and did not span the full membership of the EOSC Association.

We chose to carry out a targeted consultation to avoid contributing to "survey fatigue" (which was at best only partially achieved) in the EOSC ecosystem, and to ensure the amount of responses was manageable to digest within a short timeframe and with limited resources. It therefore did not attempt to involve a statistically representative number of respondents. In total, the consultation was sent to around 150 organisations and individuals.

The consultation was open from 7 February to 17 March 2023, and obtained a total of 25 responses[7] from 11 research infrastructures (three responding as giving their personal opinion), 5 e-Infrastructures (two personal opinions), 2 Research Funding Organisations, 1 science ministry, 3 Research Performing Organisations, 3 service providers. Classifying them according to the relation with the EOSC Association, respondents came from 8 EOSC-A Mandated Organisations, 10 EOSC-A members and 2 observers, and 3 EOSC Steering Board members. For personal opinions that might not coincide with that of their organisation we have tried to understand how their perspective fits in the broader picture.

A primary stakeholder group targeted with this survey is the members of the EOSC Steering Board. After a well-attended dedicated webinar introducing the report and announcing the survey, a disappointing total of three responses were received from SB members. As representatives of the EU countries and countries associated with Horizon Europe, Steering Board members play a key role in the discussion about EOSC's future financing. It is essential

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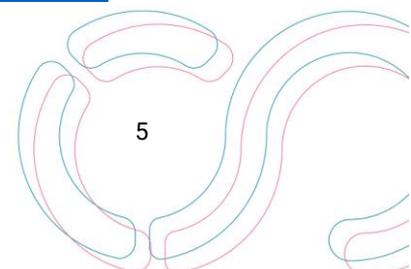
that the FinSust TF is aware of the Steering Board members' views to allow the TF to produce, on behalf of the EOSC community, a meaningful proposal for sustainable financing of EOSC.

From a geographical perspective, we saw single respondents from Austria, Belgium, Denmark, France, Greece, Ireland, Netherlands, Norway, Poland, Slovakia, and Spain, and 2 each from Germany and Romania. The remaining 10 stem from international organisations.
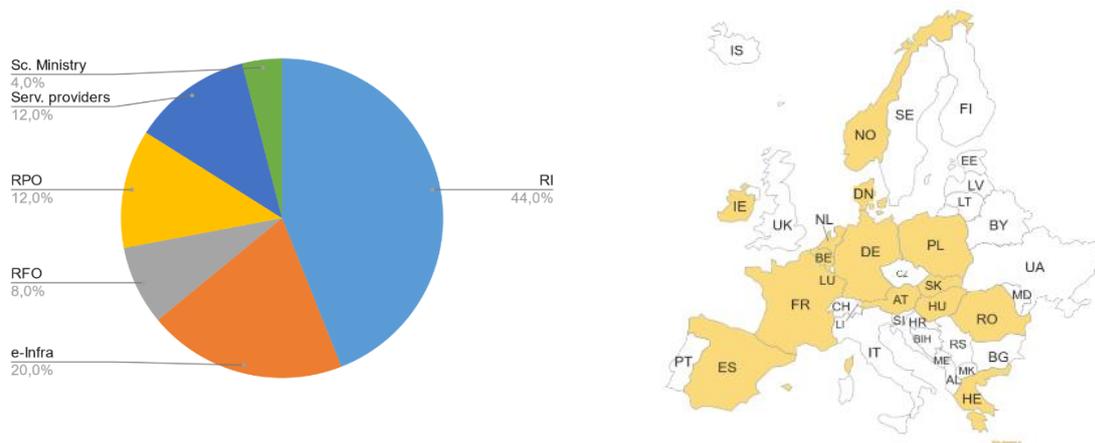

Figure 1: Classification of respondents (left) and geographical distribution (right)

The findings were broadly consistent across different stakeholder groups, so an additional analysis per stakeholder group was not considered necessary. The number of responses indicates some trends in certain stakeholder groups (e.g. international research infrastructures), but does not allow deeper analysis.

Responses were first transferred to a more readable format from the original spreadsheet. For the *closed questions with graded answers*, i.e. questions 1, 4, 6, 8, 10, 11 and 14, we evaluated the number of responses in agreement or disagreement to identify trends (i.e. consensus, major/minor disagreement, showstoppers), and analysed the accompanying reasons for disagreement (questions 2, 5, 7, 9, and 15). Responses to *open questions* (questions 3, 12, 13, 16, 20 and 21) were collated and analysed. Question 17 (*multiple choice*) was analysed together with question 18.

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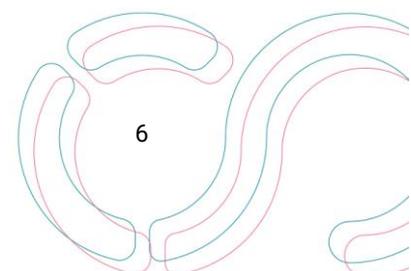
4. Main findings

This section contains the views expressed in the responses to the survey. We have tried to keep any interpretation to a minimum, and indicate where relevant when our opinion has been added. We acknowledge however that in our aim of describing responses in language that is easy to interpret, we may have introduced our views on the topics under discussion.

EOSC Core

Funding

The majority of respondents agrees that **combined funding is the best way forward to fund the EOSC Core from both EC and MS/AC**. Some respondents call for further discussion and a clear proposition on the division of the funding between EC and MS/ACs. However, a minority of respondents express their preference for funding exclusively from the EC, albeit with shared (EC-MS/AC) governance.

Governance

A majority of respondents agree to a shared governance between EC and MS. Some respondents support the inclusion of EU Associated Countries (AC) in the governance (i.e. same treatment as MS), the creation of a Scientific Advisory Committee (SAC) or similar body, as well as strong involvement and influence of RIs in the governance to ensure buy-in from the RIs, and more user-driven development of EOSC.

Requirements of the EOSC Core

Some respondents recommend long-term commitment from the funding parties. While there is no consensus about what "long-term" exactly means, it is understood to mean periods longer than the 3 to 5 years typical of projects. Also, several respondents note that keeping the EOSC Core small but targeted will allow it to better match user needs and be more agile in order to be compatible with parallel developments (e.g. Simpl[8] procurement, Gaia-X).

Respondents also express the view that EOSC needs to be "from science for science", incorporating from commercial platforms only those aspects necessary to keep EOSC focused on researchers' needs.

Additionally, respondents from RIs with a global scope advocate the use of EOSC Core services to replace some of their own local instances of equivalent services, highlighting that this would represent a clear added value of EOSC. A corollary of this is that the Core services would need to be more widely accessible than is currently envisioned.

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[8] Simpl stands for the Smart Middleware Platform, being procured for the European Common Data Spaces. See https://etendering.ted.europa.eu/cft/cft-display.html?cftId=12922 for details on the procurement, and https://bit.ly/EC-Simpl for further information on Simpl.
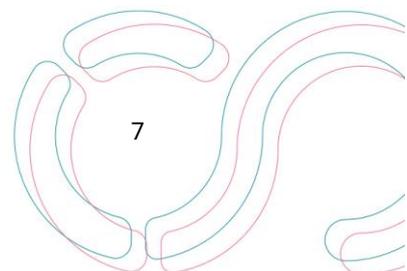
EOSC Exchange

There is consensus among respondents on the proposed definition of the **EOSC Exchange's main role**, i.e. to facilitate service findability, service transactions and cost recovery mechanisms.

Some Mandated Organisations suggest that EOSC Exchange should also work at national scale, i.e. be the marketplace where to look for services for activities carried out within MS, not necessarily involving any border crossing for provision or consumption of services. We note that this is in line with the TF proposal to develop a "single marketplace for research services".

In order for the Exchange to be financially sustainable, respondents make the following recommendations:

- ensure the simplicity and stability of the financial transaction mechanisms;
- make payment mechanisms compatible with the nature (especially the constraints) of public sector institutions, and ensure that non-centrally financed services can be funded and accessed through streams other than projects;
- plan financial commitment from EC/MS for centrally funded services with a long-term perspective to facilitate the buy-in from RIs;
- engage in conversations with MS to extend the mandate of national service providers, and to enable host institutions to provide services across (national) borders;
- provisions regarding eligible costs for research, development and innovation projects financed by European or national programmes need to enable the use of project funds for service payment. In particular, members from project consortia should be allowed to use funds for services provided by a member of the same consortium;
- use domain-specific solutions already in place from the clusters, where available, in order to accelerate service uptake.

Funding and payment (cost recovery) mechanisms

The division of services into three categories (centrally funded, commercial, and brokered not-for-profit) seems to be largely supported by respondents. A large majority agrees with the idea that services and resources deemed essential to conduct research should be centrally funded, but what constitutes an 'essential service' remains unclear.

In general terms, respondents agree on the need for **cost-recovery mechanisms for non-centrally financed services to be simple enough, transparent, and compatible with the nature & constraints of the public sector**. They should also lead to a more predictable/stable income, and enable cross-border provision.

Some users question **service reliance**. They point out that for researchers to rely on a service, there needs to be a long-term funding perspective. Project funding (i.e. payment streams of 3-5 years) might suit researchers to pay for service use, but to make services stable providers need to set up appropriate structural budgets.
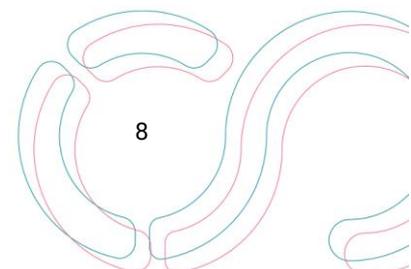
Respondents do not unanimously agree with establishing **procurement-compliant agreements** with providers to facilitate access to commercial services. Some respondents perceive centralised procurement to be either too complex for those who want to use it, or not usable at all. Thus, while commercial providers are seen as necessary, some responses do not see centralised procurement as completely aligned with their needs.

In the case of brokered not-for-profit services, there is no strong opposition to any of the mechanisms presented. All seem to be relevant to some extent, or for specific (sub-)types of services in this category.

Although deemed important, some respondents express doubts regarding the feasibility of implementing **virtual access**[9], because of its many restrictions and its incomplete suitability for cost-based accounting.

Vouchers and tokens are seen as the second most relevant model. Respondents point out their potential to be used by funders to incentivise service uptake in EOSC, and their relevance for the long-tail of science. They suggest addressing potential quality issues to reduce risks.

Direct payment was considered important or somewhat important by the majority of respondents. In this context, some ask for clarity about whether EOSC Exchange is supposed to be B2B or B2C (i.e. whether it focuses on service providers or users, or both) when it comes to the individual uptake of services.

Subscription is mostly seen as important. Some respondents indicate the possibility of extending it to allow for allocation of grants to end-users by the subscribing institute, or to allow communities (such as a multinational RI) to be the subscribing entity. Only one respondent considers that dedicating funds for subscription is not good for projects, which have a limited life span and would rather use the funding for other activities.

Some respondents also suggest the following additional mechanisms:

- **nationally-organised framework contracts** for EOSC-approved services;
- **pay-per-use** and **commissioning**;
- **project funding**.

Regarding project funding, several respondents emphasise that it will continue to play an important role, so the different mechanisms cannot be mutually exclusive.

Governance

Respondents deem important the establishment of a **selection process for the centrally funded services** included in EOSC Exchange; the process has to be transparent and user-driven in line with the Task Force's suggestion to establish a Scientific Advisory Committee. Furthermore, some respondents suggest additional selection criteria such as monitoring and

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[9] For details on virtual access, see the Annotated Grant Agreement (https://bit.ly/HE-AGA).
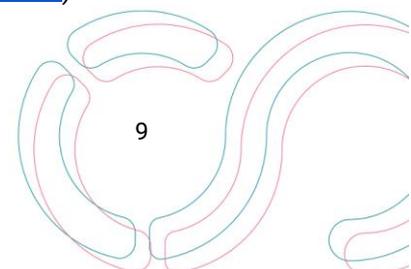
trend analysis of usage statistics. Others highlight the need for flexibility and freedom of choice of supplier, implementation and service delivery models.

Generally, respondents demand that EOSC Exchange should include a sufficient quantity of high quality services in order to provide added value for researchers. The requirements imposed by VAT and procurement regulations are perceived as legal barriers to the provision and consumption of services.

Some respondents (in particular those from global/international RIs) reinforce the need for the scope of the essential services to be extended to all users and communities. There are different opinions about whether "services for all communities" need to be of (some) use to ALL users, or whether it suffices if these services have the potential to become truly horizontal, but are currently essential only to a certain range of users (which may be broad but not encompass all). To achieve this, transparency in the selection process is seen as mandatory.

EOSC Data Federation

Respondents show strong support for the idea of advancing the EOSC DF such that it enables researchers to find and acquire data from multiple sources available at any of the levels of aggregation through attribute-based discovery. As one respondent suggests, "FAIR principles are effectively implemented using appropriate infrastructures, cross-domain data standards, and hierarchical federation based on location, domain, and level of aggregation criteria". They also endorse the idea that responsibility and ownership for data must remain with the producers and/or research communities, in particular data-producing research infrastructures, who can ensure data quality. A good common understanding of the entire data life cycle at all levels (researchers, institutions, funders) is also considered to be important to advance the establishment of EOSC DF, and to implement policies that ensure data sovereignty.

Funding

As with the EOSC-Core, respondents identify long-term co-funding commitment from the EC and MS/AC, using suitable contribution models, as one of the key requirements to enable a successful and stable federation of data sources and their connected services. The cost of investing in connecting their data with the EOSC needs to be justified.

According to responses, funding mechanisms that ensure the financial sustainability of the EOSC DF need to

- support continuity in competence building (data stewards, legal, technical staff);
- contribute to establishing and operating data infrastructures connected to and federated through EOSC;
- enable data FAIRification and the necessary accompanying infrastructures, so existing federations and local institutions can overcome their difficulties to share FAIR data;
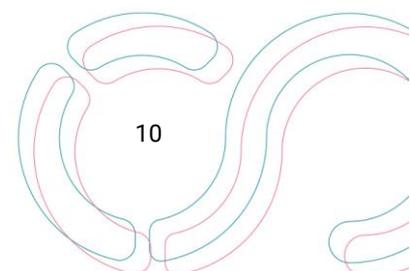
- help establish EOSC-interoperable trusted digital repositories that enable data preservation (this would probably be for MS national funding to address, and should consider the longer timescales of repositories, way beyond typical project-based funding).

To ensure these requirements can be met, respondents recognise that a clear and realistic prediction of the expected costs and responsibilities is needed. One respondent suggests breaking it down as follows:

- Institute: funding to make data FAIR.
- National: funding to build trusted digital repositories, preservation and interoperability/connection with EOSC.
- EOSC: funding to improve discoverability and integration with services (curation and integration of datasets, analysis, compute)

Respondents also suggest considering local contributions. One response calls for MS national programmes/projects to be redirected as, or refocused on, EOSC rather than creating new initiatives like data spaces with which EOSC then needs to be aligned.

While respondents indicate that the responsibility for funding the different costs associated with federating data should be shared across several aggregation levels, the majority of answers pointed to the biggest financial responsibility being assigned to the MS/AC in almost all cost categories.

Challenges and open questions

Various respondents state that they need more clarity on what the Data Federation will look like and entail (both architecturally and financially), and on what the added value of a centralised aggregating overlay would be, when it is clear that data should remain with the communities. In the opinion of one respondent, such clarity would also help create willingness to pay from EC and MS/AC as intended contributors.

A strong need for incentives to make data available in EOSC was expressed in response to several questions. Furthermore, when looking at other national and European initiatives on data spaces, some respondents see a risk of building large and very costly systems of diverse aggregations which are of limited practical use.

If a decision to establish an overlay or access portal is made, some respondents indicate that it needs to be functional, usable, and have predictable costs. Some think funding for the overlay should be central, i.e. follow the model of EOSC Core and (part of) Exchange; furthermore, this layer should be kept alive by feedback mechanisms (e.g. the Observatory) or by directly citing use of EOSC resources/services in scientific reporting (e.g. papers). Data re-use needs to lead to scientific credits for the data producer.

Finally, several RIs have raised the attention of the Task Force to one of their characteristics: due to their international and often distributed nature, their contribution to data curation and

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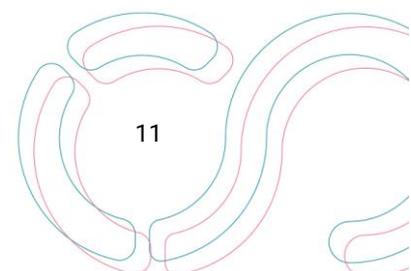
hosting cannot be easily positioned at the national or institutional level but should be seen as an overall thematic service.

5. Directions for further work

We summarise here directions for further work suggested by the responses, either directly as reply to question 21 in the survey or included in the responses to other questions.

The TF FinSust will duly take these suggestions and recommendations into consideration, either directly in this document or as part of the work towards its final report, but cannot determine, at the time of writing of this report, which ones and to which extent as time and resources are limited.

In some cases, we have been able to identify how some work could be tackled, but many of these questions lie out of our reach.

As a general suggestion, the TF and by extension the EOSC-A should consider taking a holistic approach in its future work, rather than divide the EOSC into three components (EOSC Core, EOSC Data Federation, EOSC Exchange). Yet, whatever the conceptual framework chosen, EOSC should focus on researchers' needs.

Regarding **EOSC Core**, the partition of its funding between the EC and MS needs to be discussed once the next governance of EOSC has been decided.

Some respondents indicate that it is necessary to gain more insights into the costs associated with running EOSC (EOSC Core, centrally funded services in EOSC Exchange, and Data Federation). Better knowledge of the costs that need to be recouped would enable more informed decisions on the revenue model to be made such that they eventually lead to sufficient income to compensate for the costs.

> *Response of the TF:* We agree that the costs indicated need to be clarified, in particular the extra costs that have to be incurred by the RIs and their funders to enable the EOSC Data Federation. Regarding cross-border provision of services, it now involves either the RI model of in-kind contributions or EC funded projects. It remains to be explored whether other models can contribute too. One could furthermore investigate which aspects of the model for cross-border service provision employed by the distributed data infrastructures set up as ERICs could be adopted by EOSC, and how they would add value to the platform.

International RIs indicate that global access to EOSC Core services would be in line with their own global scope. Furthermore, they expect EOSC to take into account a long-term funding perspective, since this would match their life cycle, and that of the data they generate and store. Respondents encourage EOSC to get user communities engaged in its development.
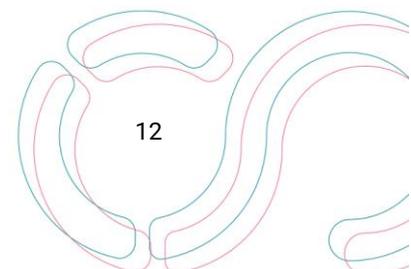
Response of the TF: Providing global access to certain services in EOSC Core, as wished by international RIs, requires further discussion to elucidate if/how it could be done. EOSC must keep its direction aligned with that of user communities. Decisions on how to reach the right combination of widely accessible and local instances of services have to be discussed with research communities and service providers, since there are RIs that do not have EOSC-compliant IT infrastructures in place or planned, be it for lack of IT or financial resources, or for strategic reasons.

Additionally, the request from international RIs to make services offered by EOSC Core more widely accessible deserves further discussion.

Some topics related to **EOSC Exchange** addressed in the TF report have already been discussed in previous EOSC-related projects; a few of them still lack a satisfactory solution:

- What constitutes an 'essential service' and is thus deemed fit for central funding remains unclear.
- A further question that deserves study is whether access to the centrally financed services in EOSC Exchange should be limited to organisations in the EOSC Association membership. The TF is aware that this issue is currently under discussion by the Task Force Rules of Participation, the EOSC Association and the European Commission, and we will closely follow the developments and the conclusions reached by them. In general there is a need to investigate (the consequences of) different possible scopes of this portfolio of centrally financed services, e.g. to which extent the "services for all communities" have to be of (some) use to ALL users, or whether it suffices if they are currently essential only to a certain range of users, and how to deal with a global scope of users which is pertinent for RIs with a global reach.
- As noted above, unless EOSC can find good reasons to discard any of the payment mechanisms mentioned on practical grounds (because they are considered not too important, do not have enough users to justify the paperwork, or generate too much overhead), they will all probably need to co-exist in the future. What does this tell us about the way in which EOSC Exchange, and furthermore EOSC, must be organised? Here, the question of whether EOSC Exchange should be more B2B or B2C oriented needs to be addressed by assessing their consequences, with realistic assessment of what is possible in each case, and including a closer look at the financial transaction mechanisms.
- The mechanism of procurement-compliant agreements needs to be further detailed and discussed to deal with the consequences of incompatibilities between procurement rules in EU/EEA countries and those countries/organisations part of the EOSC countries that have to follow a different ruleset.
- Additionally, the need for further mechanisms, like e.g. pay-per-use, or nationally organised framework contracts, must be substantiated. The TF understands that it would be good to provide clarification on how subscription is to be understood in EOSC, regarding e.g. payment forms. Also, clarification on the role of virtual access should be provided.
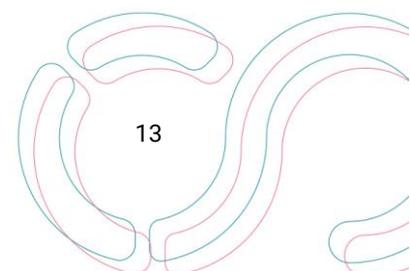
- A clear request from respondents is to explore how the mandate for national service providers can be broadened so that cross-border service provision can be expanded. The TF is aware of potential conflicts that can arise here for public organisations, and will explore how they can be solved. The cross-border service provisioning experiences of ESFRIs and ERICs should be considered.
- Legal obstacles to public sector entities buying services from cross-border public sector entities (procurement-requirements, VAT) need to be clarified: are there solutions to this challenge? This likely requires input from European bodies with the relevant expertise.

Regarding **EOSC Data Federation, there is no strong support among respondents for creating centralised portals or an "overlay"**. Instead, further work to agree on the financial and technical requirements to establish a federation of EOSC-interoperable trusted digital repositories and data infrastructures is needed. This would ideally include a clarification on allocations of costs and responsibilities with regards to FAIRification, federation, interoperability, and preservation of data resources on different levels.

The requirements, characteristics and costs associated with federating data through the EOSC Data Federation need to be defined, clearly differentiating which cost categories are considered to be at the European level and which require financing of investments and operations at national and institutional level, with the latter two expected to bear the brunt of the cost. To develop a long-term funding strategy, it is necessary to create consistent budget planning that assigns the necessary funds for data interoperability, curation and preservation. A meaningful EOSC Data Federation requires a meaningful amount of content (data) to be accessible through it. The data should furthermore fulfil minimum quality criteria which are to be agreed with the research communities.

The alignment of EOSC with the European Common Data Spaces, Simpl, and other initiatives such as other European Partnerships, or other initiatives of relevance to the web of FAIR data and services, should be explored.

How the money flows in the Data Federation should be further investigated and detailed.

The fragmentation of pan-European infrastructures and the large number of initiatives building EOSC of the current landscape needs to be addressed.

Consistent budget planning and assignment of the necessary funds for data curation and preservation has to become a priority for a successful and stable EOSC Data Federation. This requires cooperation between EC and MS/AC to find suitable contribution models that ensure the required long-term co-funding commitment.

6. Supplementary information

Questionnaire: https://doi.org/10.5281/zenodo.8334658

Responses: https://doi.org/10.5281/zenodo.8334715