EOSC NORDIC

D3.1 EOSC Service compliance checklist and maturity model

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Abstract:

This document describes the compliance checklist devised for assessing services in the Nordic and Baltic region for their fit to the European Open Science Cloud (EOSC) Service model. It also defines a maturity model that is going to be used for progressing services towards becoming an EOSC service as well as improving service quality for the existing EOSC services. This document is intended to be a living document and updated if significant changes occur that would affect the outcome of this deliverable.

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1. Introduction

This document describes the compliance checklist devised for assessing services in the Nordic and Baltic region for their fit to the European Open Science Cloud (EOSC) model. It also defines a maturity model that is going to be used for progressing services towards becoming an EOSC service as well as improving service quality for the existing EOSC services.

This document is intended to be a living document and updated if significant changes occur that would affect the outcome of this deliverable. Changes will be tracked by version and described in the Changelog attached in the Annex of this document.

The deliverable is also written at a time when EOSC is undergoing stabilization and there is a lack of public reference documents, in particular on Rules of Participation, Architecture and Sustainability. As such, some of the statements in the initial version of this document could be outdated, as we base the document on the information available to us at the time of writing.

We are basing important parts of our work on the initial Rules of Participation document. While our understanding is that future, yet to be established EOSC legal entity, will assume ownership of EOSC Rules of Participation and define clear requirements on services and service providers.

1.1 Goal

The main goal for creating this document and the associated maturity model is to create a shared understanding of what an EOSC Service is in the Nordic and Baltic region, as well as create an easy to use method for evaluating existing and future services for EOSC compliancy.

Please, note that the motivation for providing an EOSC Service is outside the scope of this document and is expected to be provided by EOSC Sustainability WG that at the moment of writing of the deliverable has not yet announced a final version of the sustainability model.

1.2 Target Audience

This document is intended primarily for the Service Providers aiming to provide services in EOSC and work on maturing the service as well as EOSC-Nordic support group for Service Providers. Furthemore, we release the deliverable under an open license as well as plan to use the content in dissemination to reach Service Providers globally.

We approach the definition of both compliance checklist and maturity model by first analysing existing state of the affairs in EOSC ecosystem. As much as possible, we try to reuse existing solutions as is or extend them to fit the EOSC-Nordic region specifics.

1.3 Document structure

The document is structured as follows:

- **Glossary** provides a brief list of the main terms that we use within this deliverable.
- **EOSC Background** describes briefly the desired EOSC ecosystem and in particular describes what is the process of becoming an EOSC Service.
- **Maturity model** describes the model which is used for evaluating services.
- **Checklist** presents checklist created, as well as contains references to the offline and online versions.
- **Conclusion** provides a summary and lessons learnt when creating the model.

2. Glossary

This section contains the definitions of the key terms used in this deliverable of EOSC-Nordic WP3. In order to keep an alignment to the EOSC Portal, we adopt existing definitions from the EOSC portal[1] and FitSM glossaries[2]. EOSC will use FitSM, standards for lightweight IT service management, during service validation in the process of adding service to its service catalogue.

Definitions from additional sources may be adopted if considered necessary. We recognise that EOSC is undergoing stabilization of understanding, in particular with respect to EOSC Architecture and Rules of Participation, so that exact interpretations might need updating once output of these EOSC working groups is mature.

EOSC

According to EOSC glossary: "the European Open Science Cloud promoted by the European Commission to provide all researchers, innovators, companies and citizens with seamless access to an open-by-default, efficient and cross-disciplinary environment for storing, accessing, reusing data, tools, publications and any EOSC Resource for research, innovation and educational purposes."

Service

At this point in time, we are using a service model in the context of the FitSM standard series.

According to FitSM glossary: "A way to provide value to customers through bringing about results that they want to achieve."

Please note that when referring to services, usually IT services are meant.

EOSC Service

According to EOSC glossary: "An EOSC Resource implemented by the EOSC System to provide EOSC System Users with ready-to-use facilities. EOSC Services are supplied by an EOSC Service Provider in accordance with the EOSC Rules of Participation for EOSC Service Providers. EOSC Services are approved by the EOSC Service Portfolio Management Committee and populate the EOSC Service Portfolio and the EOSC Service Catalogue."

In writing this document we will assume that EOSC service is an IT service[3] that provides value to EOSC.

EOSC Service Catalogue

According to EOSC glossary: "the list of all live EOSC Services that can be requested by EOSC System Users. It is a subset of the EOSC Service Portfolio and it populates the EOSC Service Registry."

EOSC Service Portfolio

According to EOSC glossary: "the internal list of EOSC Services including those in preparation, live and discontinued. The development of this list is controlled by the EOSC Service Portfolio Management Committee."

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[1] https://www.eosc-portal.eu/glossary

[2] https://www.fitsm.eu/download/280

[3] Other possible types of EOSC Services, like ones offering access to specialised equipment, biological material, fabrics, fossils, … etc. are not taken into consideration.

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EOSC Service Registry

According to EOSC glossary: "an EOSC Service providing EOSC System Users with a list of live / ready-to-use descriptions of EOSC Services offered by the EOSC System. The list includes (a subset of) the entries in the EOSC Service Catalogue as well as any other service worth being discoverable via the service instance. "

Maturity model

Services that wish to be listed in the EOSC portal are expected to be of acceptable maturity levels. FitSM defines maturity level as achieved overall effectiveness of a service management system, based on the combination of the capability levels of its processes and general aspects of management. FitSM is divided in six parts[4] and FitSM-6[5] is intended for assisting the maturity of service management (85 requirements). Maturity evaluations starts with FitSM-6 capability maturity assessment[6].

A maturity model is a tool for assessing "the capability level of a process or the overall maturity level of a management system."3 FitSM describes a maturity model as 'Assessment'.

We would like to highlight the fact that FitSM focuses on the maturity of service management systems, and provides sound examples on how to conduct maturity evaluations. However, our focus is on the 'actual services'. Therefore, we define additional service-centric measures that enable us to define the maturity of the service as a whole (and not only service management aspects). The maturity model (see section "Maturity model") provides a tool for describing the maturity of services based on different characteristics spread across five categories.

Service portfolio

Internal list that details all the services offered by a service provider, including those in preparation, live and discontinued[7].

EOSC service portfolio

The internal list of EOSC Services including those in preparation, live and discontinued. The development of this list is controlled by the EOSC Service Portfolio Management Committee.

3. EOSC Background

This section introduces the main components/concepts of the EOSC (see section "EOSC Ecosystem"), lists currently being defined rules of participation (see section "EOSC Service and Data Requirements") and describes the procedure to include services into the catalogue and portfolio (see section "Become an EOSC Service Provider").

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[4] https://www.fitsm.eu/fitsm-parts/

[5] FitSM-6 provides a capability/maturity assessment model to allow organisations and service providers to check and demonstrate their current capabilities in the FitSM processes and their overall IT service management (ITSM) maturity.

[6] https://www.fitsm.eu/downloads/#toggle-id-7

[7] https://www.fitsm.eu/download/280/, p10

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3.1 EOSC Ecosystem

"What is EOSC and how are we going to build it?"

This fundamental question was addressed recently by European Open Science Cloud strategic implementation plan[8]. EOSC can be seen as a place where we are designing virtual commons for science producers and consumers to come together for more insights, new ideas and more innovation.

EOSC resources are of fundamental importance in designing such virtual commons, and they are chosen in a way that supports the main EOSC objectives[9]:

1. to increase the value of scientific data assets by making them easily available to a greater number of researchers, across disciplines and borders;
2. to reduce the costs of research data management;
3. to ensure adequate protection of information/personal data according to applicable EU rules;

In order to present and categorise such resources, to facilitate the access and use of them, the EOSC Portal[10] has been developed.
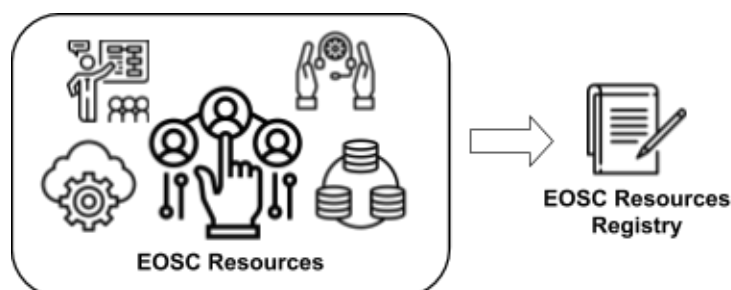

Figure 1 EOSC Resources include services, datasets, software, support, training or any other asset

3.2 EOSC Service and Data Requirements

Even if the initial Rules of Participation are not yet available[11], it is a common understanding that all stakeholders shall adhere to them and uphold the common values listed in the EOSC declaration[12] (e.g. focused on research needs, user and community-driven, inclusive and respectful of diversity, accessible to all, open by default – closed where necessary, transparent and trustworthy, etc).

The initial Rules of Participation document[13], that will be finalised only in Q3 2020, represents a framework for future EOSC policies and defines these three sets of rules:

- Ground Rules
  - o G1. EOSC is open to all
  - o G2. EOSC resources are registered in an EOSC recognised catalogue

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[8] https://op.europa.eu/en/publication-detail/-/publication/78ae5276-ae8e-11e9-9d01-01aa75ed71a1/language-en

[9] https://www.eosc-portal.eu/governance/rules-participation

[10] https://www.eosc-portal.eu/

[11] Q3 2019: Initial EOSC Rules of Participation and Q3 2020: Final EOSC Rules of Participation

[12] https://ec.europa.eu/research/openscience/pdf/eosc_declaration.pdf

[13] While the work of EOSC Rules of Participation Working Group is converging into its final version, we are taking into account, unpublished, latest version of this initial document.

- Data
  - o D1. Data resources exposed through EOSC are free of charge at the point of access
  - o D2. Data producers adhere to principles of proper research conduct
  - o D3. Data providers determine the terms of use of data resources
  - o D4. Data providers will respect principles of FAIR data
  - o D5. Data users adhere to the terms of use of data resources
  - o D6. Data users reference the source
- Services
  - o S1. Services exposed through EOSC are free of charge at the point of access
  - o S2. Service providers adhere to principles of proper research conduct
  - o S3. Service providers determine and publish the conditions of use of their services
  - o S4. Services align with EOSC architecture
  - o S5. Service users adhere to the terms of use of the services they consume
  - o S6. Service users reference the source

As the sets of rules regarding Data and Services are separated, the underlying assumption is that datasets do not occur per-se / on their own, but rather they are made available by EOSC (Data) Services.

This distinction allows us to define additional requirements for the services which are making available research data within EOSC.

In the following chapter we will describe how an EOSC Service supplied by an EOSC Service Provider is approved by the EOSC Service Portfolio Management Committee and added to the EOSC Service Portfolio and EOSC Service Catalogue.
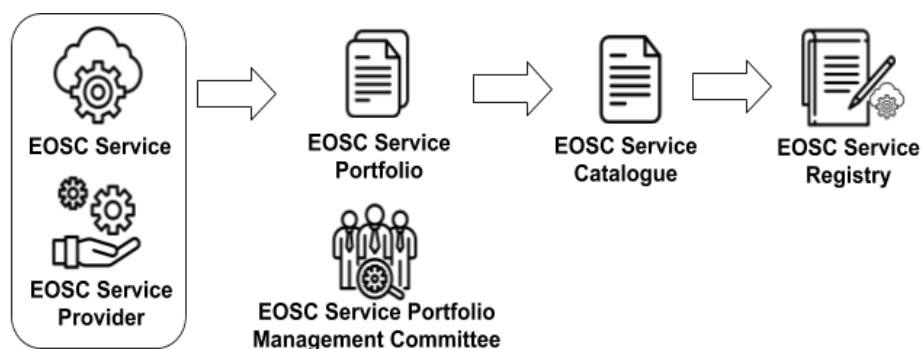
Figure 2 EOSC Service Onboarding

Services and resources of the EOSC Portal are provided and maintained by different providers under a variety of licenses and business models. To become an EOSC Service Provider, the EOSC Portal requires[14] that:

- The service is accessible by users outside its original community.
- The service is described through a common template focused on value proposition and functional capabilities.
- At least one service instance is running in a production environment available to the user community.
- Published Research Data is Findable, Accessible, Interoperable and Reusable [reference to FAIR].
- Release notes and sufficient documentation are available.
- Helpdesk channels are available for support, bug reporting and requirements gathering.

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[14] https://www.eosc-portal.eu/for-providers

There is a high degree of freedom regarding the deployment model. EOSC Services can be provisioned by a single business, academic or government organisation as well as by a federation, a third party or a combination of them.

The process of adding a service to EOSC Service Catalogue is called Onboarding.

3.3 Become an EOSC Service Provider

The process described below describes the Onboarding process, at the time of writing this document. We are aware of the initiatives done under EOSC Secretariat[15] to streamline and improve this process as well as of the EOSC Enhance[16] project. Once the Onboarding process is updated, we shall also update this document.

The first step in the journey of becoming an EOSC Service Provider consists in filling in the webform[17] "Join provider" and submitting it. The information submitted through the form is processed by the EOSC-Hub team and results in creating an internal EOSC-hub ticket which is used for tracking the request.

At this point a process (see Figure 3) called "Service Provider Onboarding" starts.

Staff assigned to work with Service Portfolio Management (SPM) takes ownership of the ticket and sends to the submitter a Service Description Template[18] (SDT) to fill in additional information regarding the candidate service.

Below are current criteria that are required for adding a service to EOSC Service Portfolio after validation process:

- It must be an actual service.

It must be a service according to the IT Service Management definition[19]. It should be an ongoing activity offered 'live' to customers. This may be an IT service, or a human service (e.g. training, consultancy).

- It may not be a research product, for instance, a document, a dataset or a piece of software.
- The Service must be coherent. It must be available and offer value on its own. It may not be only a feature of a larger service.
- Service must meet at least **one** of:
    - The service must be targeted to the research community
    - The service must be provided by the research community
    - The service comes from an EOSC related H2020 funded project
    - The service is part of a procurement framework targeting researchers.
- The service must be both available in Europe and available in a European language[20].
- The required fields in the SDT must be filled, including required linked information.
    - Host part of the URLs must be Fully Qualified Domain Names (FQDN)
- Key information must be in English
    - The SDT must be in English

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[15] https://www.eoscsecretariat.eu/

[16] https://www.eosc-portal.eu/enhance

[17] https://eosc-portal.eu/join-provider

[18] https://docs.google.com/spreadsheets/d/1NPBcXRUEY73P1mN9OiGwd44KsBl-vK67t_C5Udkj6NU/edit?usp=sharing

[19] "Way to provide value to customers through bringing about results that they want to achieve." From https://www.fitsm.eu/download/280/

[20] See https://europa.eu/european-union/about-eu/eu-languages_en

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- o The basic information in the User Interface for the service must be available in English
- o Privacy statements, terms of use and SLA/SLS must be available in English. Other documentation may be in the local language only.
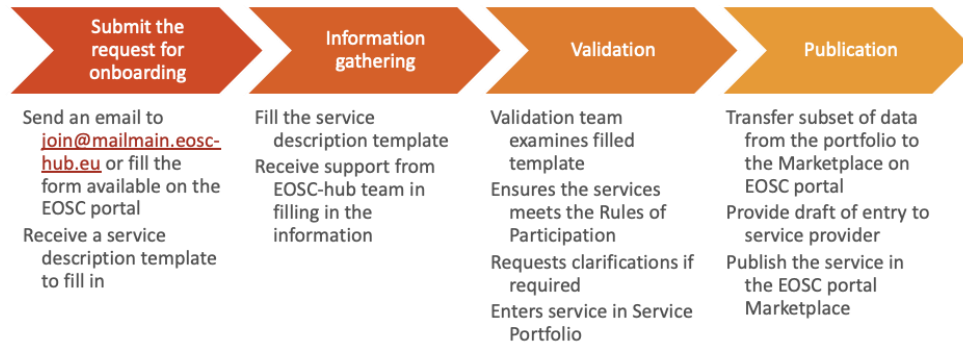- o The Helpdesk must be able to answer queries in English at a minimum.

Figure 3 Service Provider Onboarding Diagram

Once all the information is gathered, the Validation Team will evaluate it and request clarifications if needed. If all required information is provided and in compliance with requirements, the service will be added to the EOSC Service Portfolio first and thereafter published in the EOSC Service Catalogue.

4. Maturity model

The Maturity model scope was chosen to easily and quickly evaluate the maturity of a service provided by the (usually) academic community. The question that this maturity model aims to answer is this: Is this service good enough to be included in the EOSC Service Catalogue? Secondary purpose of this model is to motivate service providers to enhance the maturity of their services by providing them a model against which they can benchmark.

The model contains five separate sections that are described below. Each section lists a number of criteria which must be satisfied by a service to achieve one of the maturity levels: minimum, intermediate or professional. We will consider services, which do not satisfy minimum criteria, non-mature. Minimum requirements have to be met by any service to get it into the EOSC Portal. Intermediate requirements are intended to be a good target for any service. The third level, Professional, gives additional requirements that are more targeted for large community services or services provided by infrastructure service providers.

Most criteria in the maturity model come from IT service management (FitSM) processes and from FAIR data principles. However, it should be noted, that although the FitSM model contains a maturity model[21], it was not applicable to be used as such. This is because the FitSM model has been created to evaluate the maturity of a service management system (SMS), and not the maturity of an individual service. However, the first part of the model is strongly influenced by the FitSM model and it contains 13 questions (see table "Table 1").

The second part of the model concentrates on data management practices and quality. FAIR data principles are taken into account as an individual criteria due to the fact that there is another activity in WP4

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[21] FitSM-6: Capability / Maturity Assessment Scheme (https://www.fitsm.eu/download/312/)

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considering FAIR metrics and FAIR maturity. The results of that activity may in the future have an impact on this section. As new requirements, we suggest criteria about

- the research data lifecycle, and
- the quality plan.

The research data lifecycle is basically a data management plan for data stored to a service. In scientific quality of data and scientific quality of a service, the focus is to enforce a service provider to think what kind of actions they should do to decrease the likelihood that the quality of their data or quality of their service is by some reason not as good as they assume it to be. In practice, this quality plan could contain e.g. following things: manual checks, processes, tests, and service building and testing tools. We plan to evolve this aspect in collaboration with WP4.

The third section discusses accessibility and legal aspects of services. It is noted, that the EU accessibility directive is not on the list. The importance of this directive is not questioned, but it is not clear if research activities are required to take this directive into account.

The fourth section discusses sustainability and financial issues. This section is now very short, but it could contain questions about e.g. possibilities to sell services, capabilities to electronic billing etc. Nevertheless, here we include a question about service life time. It is noted that for communities, especially using project funding, it is difficult to give detailed estimates about the lifetime of a service. Here we ask the service provider to give a figure about a minimum time the service will be available. We consider this figure to be important for possible external service users. How much effort or trust should the external users put to take the new service to be a part of their activities?

The fifth section discusses EOSC architecture compatibility. At the moment, this list covers only one issue, but the rest of the requirements will be included when the necessary documents will become available.

Some of the attributes described in the maturity model are already defined in the *Resource Description Template v2.00* (SDT), which has been agreed among eInfraCentral, OpenAire and EOSC-hub projects. As we expect the new version of SDT to become de-facto used in the near future, we align our model with it.

DRAFT NOT YET APPROVED BY THE EUROPEAN COMMISSION

Table 1 Compliance checklist and maturity model. Cells marked with X mark mandatory requirements for a service at a certain maturity level

	Minimum	Intermediate	High		Source:
1. Service management					
S-1	X	X	X	Web address where more information about the service can be found	FitSM: Service Portfolio Management Process
S-2	X	X	X	Service maintenance contact address (ticket system queues etc.)	FitSM: Incident & Service Request Management Process EOSC portal service requirements for providers
S-3	X	X	X	Security contact address	FitSM: Incident & Service Request Management Process
S-4	X	X	X	Description of used service components, their role and interaction exists	FitSM: Configuration Management
S-5	X	X	X	Release notes and Documentation is available	FitSM: Service Portfolio Management Process, EOSC portal service requirements for providers
S-6		X	X	A policy ensuring rapid response to softare vulnerabilities is implemented	FitSM: Information Security Management
S-7		X	X	Service availability is monitored	FitSM: Service Level Management, FitSM: Service Availability & Continuity Management
S-8			X	Service level target is defined	FitSM: Service Level Management
S-9			X	Service capacity is monitored and limits are known	FitSM: Capacity Management
S-10			X	Vulnerability information channels are followed and reacted	FitSM: Information Security Management
S-11			X	Information about maintenance breaks is available	FitSM: Service Level Management
S-12			X	Service (and service component) upgrade plan that includes verification tests exists. There is a plan how to recover from a failed upgrade task	FitSM: Release & Deployment Management
S-13			X	Service roadmap and a channel to recommend enhancements to service exist	FitSM: Continual Service Improvement Management
2. Data management and quality					
D-1	X	X	X	Research data is Findable, Accessible, Interoperable and Reusable	FAIR data principles EOSC portal service requirements for providers EOSC: Rules of Participation draft
D-2	X	X	X	Disaster recovery actions for research data are described	FitSM: Incident & Service Request Management Process
D-3			X	Research data lifecycle is clearly defined	
D-4			X	Service quality plan exist	FitSM: Service Level Management,
3. Accessibility and legal requirements					
L-1	X	X	X	The service is accessible by users outside its original community	EOSC portal service requirements for providers
L-2	X	X	X	Terms Of Use is available	
L-3	X	X	X	Licences for research data are clearly defined	FAIR data principles EOSC: Rules of Participation draft
L-4	X	X	X	If the service maintain or processes personal data, data controllers and processors are identified and data controller has instructions for data processors how personal data should managed	GDPR
L-5	X	X	X	If the service maintain or processes personal data, privacy policy is available	GDPR
4. Sustainability and Financial					
F-1		X	X	Information, how long the service will AT LEAST be maintained, is available	
5. EOSC architecture compatibility					
A-1	X	X	X	EOSC Monitoring and reporting implemented	EOSC: Rules of Participation draft
				EOSC AAI implemented	To be taken into accoung when description is available
				EOSC monitoring implemented	To be taken into accoung when description is available
				EOSC accounting implemented	To be taken into accoung when description is available
				EOSC Data Transfer Services implemented	To be taken into accoung when description is available
				Persistent identifier with required metadata for services	To be taken into accoung when description is available

5. Checklist

The model described above is implemented as Excel sheet for offline and as Google sheet for online usage.

Excel sheet: http://doi.org/10.23728/b2share.7bda62f39922478b9ecc3a9b020d90e6

Google sheet: https://docs.google.com/spreadsheets/d/1Z7LxWL34Q6fxROaNs4ZvWgHcCyO9i1r-FTzyvwCZmdQ/edit?usp=sharing

We intend to apply this checklist to the services collected under Task 3.1.1 at least twice.

6. Conclusions

This deliverable focuses on consolidating information for prospective service providers in the Nordic and Baltic region, that wish to align their candidate services with EOSC requirements. We have created a checklist and developed a capacity maturity model to guide the service providers in complying with EOSC criteria. The checklist and maturity model will be in a live document that will take into account regional support infrastructure and be updated according to EOSC developments. The following are our main reflections on this report:

1. EOSC's development relies on an interplay between a variety of projects, all with the aim of providing valuable and sustainable contribution. Due to different project schedules, most if not all of the work is ongoing, making it a challenge to align the input - output interdependencies between different projects. This was our predicament as some information we needed for this work was still under development, and therefore not ready for use e.g. the initial recommendations for the EOSC Federating Core, and Rules of Participation. We aim at addressing the uncertainties by incorporating relevant information into our future activities and deliverables as the outputs get finalised.

2. Notwithstanding the challenge mentioned above, we hope the information we have put together helps service providers to have a glimpse of what it might mean to prepare their services for compliance with EOSC requirements. This information serves as a first step in bringing clarity about the process of integrating into the EOSC portal.

3. We plan to pilot the checklist and maturity model with a few service providers. This will help us in validating the suitability of purpose and making the necessary adjustments.

4. It is imperative to compare this report with similar ones delivered by other EOSC-5b projects. This will help in achieving a more coordinated and holistic alignment to EOSC requirements.