

EOSC-hub impact on design and implementation of EOSC

EOSC-hub is a key project in the formation of the EOSC landscape, and a first large scale attempt to collect, list, federate, manage and deliver EOSC-level resources from a wide range of providers and sources. It acts as a ‘beta’ version of the long terms’ structures imagined for EOSC, and hence it is expected that its outputs will be adopted as or provide a major input to the long-term structures of EOSC. In this regard, the project is working on designing and delivering several key elements for EOSC such as software and services, technical specifications, policies and procedures for service management, FAIR data management and security, documents, reports and business models. Therefore, the main exploitation path for the project outputs is the wider EOSC environment, although the usage of the results outside the EOSC is not excluded. The project Key Exploitable Results (KERs) reflect this. They are shortly described in this section together with their key benefits for the EOSC.

To maximise the impact on the EOSC, the project is establishing collaborations with the EOSC Governance and its 5 Working Groups (Landscape, Sustainability, FAIR, Rules of Participation and Architecture) to collect feedback and gather requirements for its main outputs and jointly design key EOSC elements. Feedback is also continuously collected from large user communities and any other relevant EOSC stakeholders.

Key Exploitation Results

This document provides an overview of the project Key Exploitable Results (KERs) that altogether contributed to the project impact and highlight how EOSC can benefit from them. EOSC-hub KERs support the building of the future EOSC service hub, ensuring quality of service components and by streamlining the integration of the components, and provide best practices and tools for linking services to the EOSC Hub. It is worth mentioning that, although the targets of all of them is EOSC, some have the nature of being relatively universal in their potential applications outside the project context. A detailed description of the project KERs is provided in the *Interim report on dissemination and exploitation of project results* (D3.3)¹.

KER 1. EOSC Portal and Marketplace

Type: Software and services, Policies and procedures for service management.

Short description

The EOSC Portal and Marketplace supports the service discovery and access in EOSC. As described in the EOSC Portal collaboration agreement this KER includes: “*technical components, intangible assets and contractual arrangements that make it possible to provide the service that facilitates the access and use of the EOSC assets. The contractual arrangements include - but are not limited to - the rights to administer*

¹ <https://documents.egi.eu/document/3496>

the IP addresses and IT infrastructure making accessing the EOSC portal at the URL <https://eosc-portal.eu/> possible.”.

Key benefits for EOSC

Thanks to this KER, it will be possible to deploy a large, diverse and well-managed EOSC portal and marketplace with a transparent governance model where: (1) the service providers will see increased interest in their services with user requirements that better match the specific offering; (2) researchers can compare solutions and reuse their credentials and knowledge related to EOSC service access with different providers; (3) the Enterprise can lower the marketing and transaction costs considerably compared to targeting individual research institutes or researchers.

The importance of the EOSC portal as the primary entry point to the EOSC ecosystem is going to grow dramatically as the scope of the EOSC services grow. Thus, a collaboration agreement between the key projects and stakeholders has been established, with a work plan that will build a long-term sustainability plan for the service. However, this focused exploitation activity does not preclude the reuse of the portal components by third parties. In fact, the anticipated growth of volume and diversity of use of the components is likely to speed up the maturing process of future versions considerably.

KER 2. EOSC Service Management System (SMS)

Type: Policies and procedures for service management.

Short description

The Service Management System (SMS) comprises the entirety of activities performed by service providers to plan, deliver, operate and control services offered to customers. Service oriented activities are directed by policies, which are structured and organised by processes and procedures.

Key benefits for EOSC

The SMS ensures robust and resilient service delivery in the EOSC federated infrastructure with different types of many-to-many relationships between users, providers and clients. The EOSC Hub facilitates alignment of service management activities of all of the service providers, supporting different levels of integration with the centralised services. SMS is a critical component in integrating the services provided by the different providers into the common marketplace and monitoring frameworks in a way that provides value for EOSC.

KER 3. EOSC Rules of Participation (RoP)

Type: Policies and procedures for service management.

Short description

A comprehensive and coherent set of rules for the services provides to onboard services into and make them discoverable and accessible through the EOSC Service Catalogue and Marketplace.

Key benefits for EOSC

RoP make it as easy as possible to bring new service providers into the EOSC ecosystem while ensuring

the quality and compliance of the overall services and building and maintaining the trust of the users and user communities.

KER 4. Internal Services in the Hub Portfolio

Type: Software and services.

Short description

The Internal Services provide basic enabling services for EOSC access and operation, such as access control or accounting, and offer common and standard interfaces to shared tools for basic services that need to be aligned in order to provide consistent user experiences. Internal services in the Hub Portfolio are one of the key elements of the EOSC federating core.

Key benefits for EOSC

This common toolset enables integration of services to EOSC ecosystem. This is a prerequisite for the function of the hub as a federating core, and a mature implementation of the tools will streamline the processes of the EOSC Hub Operators. For the service providers, the KER provides tools to access several user communities through the Hub by integrating their services to a single service interface (instead of several community-specific ones). The common services are targeting adoption by the permanent EOSC services and their importance will be increased by the growth of number of users and the value delivered through EOSC. The reuse of individual components by third parties is encouraged.

KER 5. External Services in the EOSC Service Portfolio

Type: Software and services.

Short description

EOSC provides "one-stop shop" for a range of services and solutions to speed up the research process of the disciplines and enable cross-disciplinary collaboration and reuse of tools and results. It encourages the sharing of the research tools and data between different research groups - also across disciplines. The services in the EOSC Service Portfolio each have their individual application areas and sustainability models. The EOSC Service Portfolio will support this goal by making the discovery of the services easier and reducing the effort needed to adopt them. In the EOSC context, this KER is closely linked with the EOSC Portal and Service Management System in providing a clear, comparable and valuable set of services to researchers.

Key benefits for EOSC

As the number of research activities and groups supported by EOSC grows, the possibility to easily search, request and re-use research services will become more and more important. Consistent metadata will be crucial for efficient service discovery (either by the researchers themselves or in collaboration with different helpdesk services). Providing an intuitive interface to the service lifecycle information will be of equal importance. For these reasons, this KER has a key role in the future EOSC establishment.

KER 6. EOSC Digital Innovation Hub (DIH): Platform for Industrial collaborations with EOSC

Type: Software and services, business models.

Short description

EOSC DIH provides a clear interface for commercial innovation that can be supported by EOSC as part of the broader European Digital Innovation Hub landscape. It is a multi-dimensional mechanism that allows research e-Infrastructures to support business organisations to stimulate innovation, as well as helping start-ups, SMEs, and other innovative actors to tap into the academic world both in accessing knowledge as well as technical services. The final goal is to create a one-stop shop that brings IT services, research data, and expertise into a single place to support innovation in the industry. EOSC DIH offers several public-private collaboration models, piloting and co-design of new services (proof-of-concept work, performance testing, etc.), technical access to different “as a Service” resources (HPC/HTC/Cloud computing, storage, data management and higher-level services), training and support (Technical consultancy, service management, commercialisation) and visibility, using DIH as a networking tool to expand beyond local markets.

Key benefits for EOSC

EOSC DIH allows lowers initial investment (time and effort) for identifying/accessing services and developing/testing new products and services as well as increasing visibility and networking opportunities on a European level. It will be a continued activity in the context of EOSC and the wider network of digital innovation hubs. In the long-run, it can provide a formalisation of the knowledge and expertise into procedure descriptions, standardised consulting offerings or certification schemes.

KER 7. Business and sustainability models for services and the Hub

Type: Business models, documents and reports.

Short description

The Business and Sustainability models are crucial for long-term planning of EOSC and for ensuring the trust of users and user communities on the continued delivery of services. In addition to the obvious need for efficient mechanisms to manage expenditures that are considerably larger than before, the more diverse range of research activities to be supported will require the creation of a flexible framework for public-private partnerships. These collaboration models could be seen as an expansion and continuation of the ones outlined in the Digital Innovation Hub. However, the long-term, sustainable nature of the services and the mixing of commercial and academic resource providers and user communities create additional challenges.

Key benefits for EOSC

Clear and efficient business models will increase flexibility, lower barriers of entry and reduce compliance costs in service provision and consumption by the EOSC stakeholders and will be important inputs to EOSC sustainability planning. In the second part of the project, EOSC-Hub will ensure that the relevant EOSC policy bodies are aware of the results and the knowledge available within the consortium.

KER 8. Interoperability and Integration guidelines

Type: Technical specifications, policies and procedures for FAIR data management and security, documents and reports

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Short description

Interoperability and Integration guidelines, defining high-level architecture for basic EOSC technical functions and promoting EOSC standards and APIs, will facilitate access to services, lower barriers to integrate and composes services and promotes the usage of services between adjacent communities.

Key benefits for EOSC

EOSC services ‘compliant’ with the interoperability and integration guidelines will offer well-established and documented interfaces for usage and integration, based on well-known standard or APIs, facilitating (1) their exploitation from user communities willing to create new scientific services that could rely on well-established and documented interfaces for the integration (e.g. a community creates a new scientific workflow reusing EOSC federation and common services, like AAI, accounting, etc.) and (2) the combined usage of EOSC services, indeed the adoption of well-known standards and interfaces will very-likely reduce the cost to integrate services (e.g. two accounting infrastructures can be made easily interoperable if they use the same standard usage record format, in such case accounting data extracted from them can be merged and presented in a unique view). As a consequence, less mature or small scientific communities can leverage on EOSC services for a series of IT functions and focus on their scientific work, access to scientific services will be open to new communities thanks to the documented interfaces and new scientific workflows can be created combining existing applications.

KER 9. Training courses and material

Type: Documents and reports

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Short description

The training courses and material encompass a large variety of project results. They range all the way from technical, downloadable results (e.g. Virtual Appliances, Docker containers and Jupyter notebooks used in training) to consultancy building on training events (such as workshops focused on applying the FitSM standard in the specific circumstances in the client organisations, or helping research communities to develop a sound Data Management Plans) aiming to stimulate the knowledge transfer, foster the use of digital infrastructures and promote the uptake of Open Science paradigm. The sound training programme delivered by the project aimed to stimulate the establishment of a “knowledge network” of expertise and help researchers from different scientific disciplines to better integrate advanced digital services, tools and data to achieve excellence in science, research and innovation.

Training services are tailored to optimally fit the requirements of the diverse audience EOSC needs to reach, ranging from service providers already familiar with the EOSC-Hub to individual researchers possibly encountering the e-Infrastructures for the first time, enabling a smooth integration into EOSC ecosystem and maximising the benefits.

In terms of topics, the training courses and material cover all of the other KERs as well as most of the individual project results. Curation of this material by linking the training activity closely with the other developments of the project is this a critical part of the project’s outreach activities.

Key benefits for EOSC

Training and support activities will play a key role in creating awareness of services and resources, augmenting skills and adapting organisational practices needed as prerequisites of full participation in the EOSC ecosystem. In the long run, the demand for training and related services will increase dramatically through the extension of the user base beyond the initial group of early adopters. EOSC-hub is investigating several approaches to meet this challenge in a sustainable manner.