



EOOSC-hub

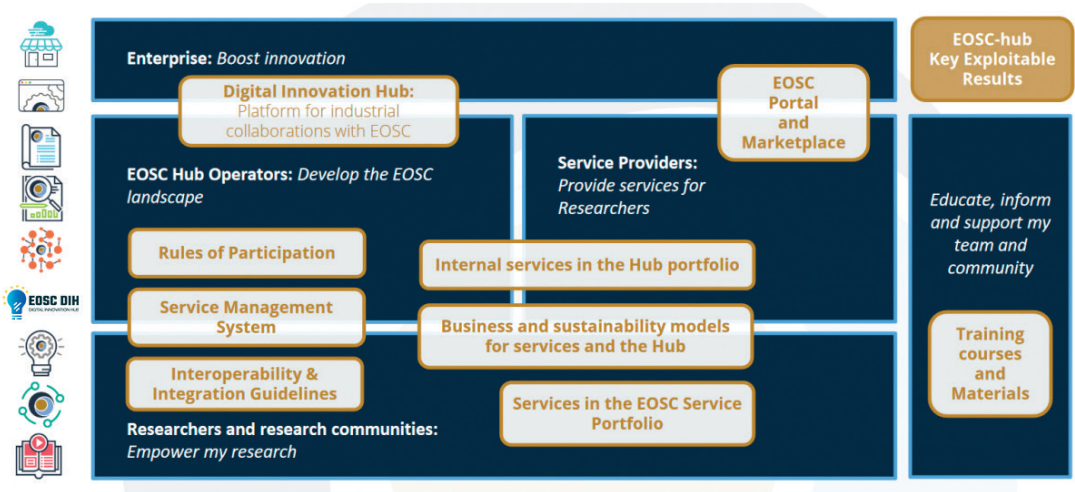
KEY EXPLOITABLE RESULTS



EOSC-Hub Key Exploitable Results

The EOSC-hub project’s aim has been to create a hub of service providers to accelerate data-driven research in Europe. The project started in January 2018 and a lot of work has been done in order to reach this ambitious goal.

Nine Key Exploitable Results (KER) have been produced and they are described below.



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KER 1. EOSC Portal and Marketplace



Type: Software and services, policies and procedures for service management

Short description

The [EOSC Portal](#) and [Marketplace](#) - that have developed into joint efforts with [EOSC Enhance](#) project - support the resources discovery and access in EOSC. As described in the 2019 EOSC Portal collaboration agreement (concluded in 2019 with the representatives of the [EOSC-hub](#), [OpenAIRE-Advance](#) and [eInfraCentral](#) project consortia) 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 the IP addresses and IT infrastructure making accessing the EOSC Portal possible”.

Key benefits for EOSC

Thanks to this KER, it will be possible to operate a scalable and well-managed EOSC portal and marketplace with a growing service portfolio and with a transparent governance model. From the researcher point of view, the benefits include the ability to:

- › [Discover](#) and compare multiple resources and services such as scientific outputs, applications, data management, compute services and thematic services;
- › Order EOSC resources;
- › Organise resources of interest and resource orders into logical blocks in EOSC Marketplace Projects to reflect a common scientific purpose and gain EOSC expert support for the created Marketplace Project;
- › Access services and resources using a common authentication/authorisation process;
- › Pick up on best practices and practical examples featuring research communities making the most of EOSC;
- › Provide feedback about services and information to contribute to building the EOSC service portfolio.

From the service provider point of view, the benefits are based on the ability to:

- › [Publish, share and advertise services](#) and resources to a wider user base;
- › Get statistics about access requests and customer feedback;
- › Get a free online platform where providers can manage service requests, interact with users and provide support to them, and agree the most suitable service levels;
- › Allow users to authenticate with existing credentials to access services;
- › Demonstrate that the services meet EOSC quality standards.

The importance of the EOSC Portal as the primary, Pan-European entry point to the EOSC ecosystem is going to grow dramatically as the scope of the EOSC resources grows. Naturally, this 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.



Use and impact after EOSC-HUB

The EOSC Portal will continue to serve EOSC users (researchers / providers / operation team members / founders etc) after the conclusion of the EOSC-hub project. Moreover, it will be further developed in the forthcoming EOSC Future project. It will go beyond the Minimum Viable Product phase to support the growth of EOSC and acknowledge new EOSC competences and use-cases. An expansion of EOSC Portal capabilities is foreseen especially in the areas of professional resource discovery and delivery (supporting both supply and demand side of the process):

- › significant expansion of the EOSC resource portfolio and catalogue;
- › evolution of the resource discovery including the integration with external, thematic catalogues;
- › inclusion of resource allocation process, EOSC interoperability framework, user-centric resource monitoring and accounting;
- › improvements on customer relationship management functionalities etc.

The focus on the EOSC user perspective and a use of UX design methods will be maintained, so all of the developed functionalities will keep user experience in its centre. Incorporation of the AI techniques will be one of the factors contributing to this goal. Also, by widening the scope of statistics components, EOSC governance will gain new relevant data regarding the EOSC development.



KER 2. EOSC Service Management System (SMS)



Type: Policies and procedures for service management

Short description

EOSC-hub defines and implements the EOSC IT service management system (ITSM), i.e. the activities performed by service providers to plan, deliver, operate and control services offered to customers. These activities are directed by policies and are structured and organised by processes and procedures.

EOSC-hub implements best practices based on the lightweight standard, FitSM, regarding the service planning, delivery, operation and control of the services in the service catalogue.

The scope of the Service Management System is primarily all services contributing to creation and delivery of the hub. The hub is a set of services essential to provide the core functionality for EOSC like: helpdesk, monitoring, accounting, order management etc.

Key benefits for EOSC

- › To ensure robust and resilient service delivery of services within the hub to the EOSC federated infrastructure;
- › To facilitate communication between customer and providers by introducing single point of contact (helpdesk, marketplace etc.);
- › To disseminate and share service delivery best practices among providers;
- › To facilitate alignment of service management activities of all of the service providers, supporting different levels of integration with the centralised services;
- › To integrate 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 framework of policies of what should be included in EOSC. Contributed to and now building on the outputs of the EOSC Governance Working Group on Rules of Participation which published its initial RoP at the end of 2020. These high level policies give a broad direction as to the scope of EOSC and the kinds of behaviour and entity expected within it.

This is then complemented by the translation from policing to processes and procedures which can be implemented, refined, monitored and evolved in the day to day business of populating EOSC with valuable providers and resources. The result of this is a live set of draft EOSC Inclusion Criteria which are included with the other Provider Documentation as part of EOSC Portal.

These are developed based on several years of experience forming and populating EOSC resource portfolios, and now in collaboration with the EOSC Enhance and OpenAIRE Advance projects. In order to further extend the reach of these rules and criteria, they are also now discussed in an open manner with representatives from other projects, including thematic and regional clusters.

Key benefits for EOSC

RoP makes 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. Practical inclusion criteria translate RoP into actionable procedures which can be used by onboarding teams to repeatably assess and support applications to join EOSC.

Use and impact after EOSC-HUB

The work on RoP from EPSC-hub has already formed a significant input for the Working Group on Rules of Participation, and as a set of practical inclusion criteria si adopted and evolved by the EOSC Enhance project, and will be further managed under a project from the INFRAEOSC-3 call.



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 the integration of services into the EOSC ecosystem. This is a prerequisite for the function of the hub as a federating core, as 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 into 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 the number of users and the value delivered through EOSC. The reuse of individual components by third parties is also encouraged.



KER 5. External Services in the EOSC Service Portfolio



Type: Software and services

Short description

EOSC provides a “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](#) have different application areas and sustainability models. However, independently of the details of the approaches, the EOSC Service Portfolio will support them by making the discovery of the services easier and reducing the effort needed to adopt them. Together with the EOSC Portal and Service Management System, the KER provides an intuitive, comprehensive and robust 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, especially when considering the long-term repeatability of EOSC-supported research.



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



Type: Software and services, business models

Short description

The [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 (such as free access trials). 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 of the EOSC DIH is to create a one-stop-shop that brings IT services, research data, technology and expertise into a single place to support innovation in the industry to become more competitive. EOSC DIH offers several public-private collaboration models around 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 the DIH as a networking tool to expand beyond local markets.

Key benefits for EOSC

EOSC DIH allows to lower initial investment (time and effort) for identifying/accessing services and developing/testing new products and services as well as increasing visibility and networking opportunities at European level. It will be continued as an 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.

Use and impact after EOSC-HUB

The EOSC DIH will be followed up by EOSC Future project as the mechanism to centralise the multiple innovation and business collaboration initiatives around the EOSC. The experience and knowledge generated working with companies on the business pilots would be used as input for the EOSC Governance for defining the innovation agenda of the EOSC and how to align it to major European initiatives.

In addition, the cross border nature of the EOSC DIH allowed the generation of external collaboration with other European Digital Innovation Hubs (EDIHs), links that have been defined as “DIH corridors” by the European Commission. The EOSC DIH will establish new corridors to cooperate with other EDIHs by complementing their technical offer which will imply a wider impact of the EOSC outside the research context.



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



Type: Business models, documents and reports

Short description

Business and Sustainability models are crucial for long-term planning of EOSC. In addition to grounding the discussions about finances, they also provide foundations for ensuring the trust of users and user communities in the continued delivery of services. This KER provides a definition for the planned “[EOSC Federating Core](#)”, including a cost assessment, a proposed value proposition for the EOSC evaluation of procurement and service delivery models applicable to different EOSC scenarios, and consideration of issues related to cross-border service provision and cross-sectoral VAT compliance.

Key benefits for EOSC

By proposing a definition of the EOSC Federating Core, this KER provides a basis for determining the costs and possible business models required to provide the EOSC and permits identification of the importance of “Shared Resources” - services and scientific products of pan-European relevance which are developed by a given discipline but used more broadly by external user communities and additional disciplines. By providing recommendations on procurement frameworks and supporting business models, and on ways in which the EOSC can support the delivery of Shared Resources such as cross-border storage and compute services in Europe, this KER points the way towards further activities required to deliver an EOSC which adds value for users and resource providers. Clear and intuitive business models will increase flexibility, lower barriers to entry and reduce compliance costs in service provision and consumption by the EOSC stakeholders, and are thus important inputs to EOSC sustainability planning. This KER contributes to the work of EOSC policy bodies, in particular to the [EOSC Sustainability Working Group](#) and [EOSC Architecture Working Group](#).

Use and impact after EOSC-HUB

Proposals and recommendations from this KER have provided input to:

- › Sustainability Working Group [FAIR Lady Report “Solutions for a Sustainable EOSC”](#)
- › Architecture Working Group [View on the Minimal Viable EOSC](#)

and have informed the preparation of the INFRAEOSC-03 project proposal expected to provide the EOSC-Core in the next phase of the implementation of the EOSC.



KER 8. Interoperability and integration guidelines



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

Short description

[Interoperability and Integration guidelines](#), defining the high-level architecture for basic EOSC technical functions and promoting EOSC standards and APIs, will facilitate access to services, lower barriers to integrating and composing services and promote 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.

Use and impact after EOSC-HUB

The Interoperability and integration guidelines have been used by a large number of related projects that continue beyond the EOSC-hub project itself to make their services EOSC-compatible. This is already happening, for example, in the EOSC regional projects funded under the INFRAEOSC 5b call. Moreover, the interoperability standards will be maintained and further developed by the upcoming EOSC Future project.



KER 9. Training courses and material



Type: Documents and reports

Short description

The [training courses and material](#) encompass a large variety of project results. They range all the way from common and federated services for supporting the whole research life cycle, domain-specific training to target the needs of data providers and data scientists and advanced training on higher-level composable and PaaS services 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 who e.g. might benefit from technical assistance on using, integrating and providing services in EOSC 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 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. Synergies and collaborations with other EOSC-related projects will contribute to keeping the training strategy more focused. These activities complement training efforts of collaborating projects like OpenAIRE-Advance and FAIRsFAIR that look into the ‘Open-ing’ and into the ‘FAIR-ification’ of science, and the efforts of EOSC Enhance from early 2020 to pull together fundamental training on EOSC. Furthermore, the continuous involvement in the EOSC-wide Training Coordinators’ Community of Practice will ensure that the lessons learned and best practices developed in the EOSC-hub training context will be available in the broader EOSC landscape.

Use and impact after EOSC-HUB

Most of the KER components are tied to the EOSC portal and its future development, and EOSC-hub has ensured that the future activities have sufficient IPR rights to curate and further develop this resource.



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EOSC-hub receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 777536.

