EOSC Future

D8.4

Digital Innovation Hub Strategy and Plans

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D8.4 / Digital Innovation Hub Strategy and Plans

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Abstract

This document covers the strategy and overall plans for the expansion of the EOSC Digital Innovation Hub (EOSC DIH) including the monitoring and evaluation system.

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List of Abbreviations

Acronym	Definition
DIH	Digital Innovation Hub
EC	European Commission
SLA	Service Level Agreement
OLA	Operation Level Agreement
EOSC	European Open Science Cloud
KER	Key Exploitable Result
TRL	Technology Readiness Level
USP	Unique Selling Point
ERDF	European Regional Development Fund
CRL	Customer Readiness Level
BRL	Business Readiness Level
IRL	Intellectual property Readiness Level
FRL	Funding Readiness Level
HRL	Human resource Readiness Level
KPI	Key Performance Indicator

1 Executive Summary

The EOSC Digital Innovation Hub (EOSC DIH) was set up and is being marketed as one of the principal mechanisms for business organisations (e.g. start-ups, SMEs, large enterprises) to directly engage the European Open Science Cloud (EOSC). The EOSC-hub project provided the initial funding to define and launch an operational EOSC DIH, establishing a number of business partnerships and pilots to increase the potential commercially exploitation of viable research data and other existing e-Infrastructure services. The EOSC DIH has been providing both human and technical services to commercial organisations to increase digitization capabilities and move new products or services into the market. The EOSC DIH was recognized as a Key Exploitable Result (KER) of the project as well as registered in the EC DIH catalogue.

The long-term strategy of the DIH was to live well beyond the life of the EOSC-hub project and to continue and expand industry engagement with the EOSC. The EOSC Future project is contributing to effectively manage the operational activity of the DIH while providing an opportunity for maturation and expansion, engaging more of the EOSC stakeholders and innovation activities with industry.

Several lessons learnt from the EOSC-hub project were identified as the seeds for the refinement of the Mission, Vision, Value proposition and Objectives of the EOSC DIH, and served as direct input to many EOSC Future activities to be carried out by T8.2. Some examples of these lessons learnt related to the EOSC DIH as an interface with the EOSC suggesting that the EOSC DIH should be consolidated and recognised by the EOSC ecosystem as a main mechanism for Industry engagement, therefore continued work is required for engaging with relevant EOSC bodies. Other lessons included maturing services and service descriptions in the EOSC DIH offer and increasing the collaboration at all levels, from EOSC Future WP inter-relations, EOSC related projects, up to the EOSC Governance Board. In the case of the EOSC DIH engagement with Industry, a more active community is needed to be generated, providing a real added value with useful tools and services and being able to measure the impact generated. One initial activity was to open up the EOSC DIH Slack Workspace and evolve the wider Community meetings to encourage more participation and visibility from the community itself. Finally, when the EOSC DIH itself is considered, lessons learnt showed the need to strengthen the EOSC DIH in roles and procedures to guarantee its effective management and coordination with strong links to the EOSC portal onboarding and service request processes.

The General objectives of the EOSC DIH are based in two main pillars. The first pillar considers the support to EU Industry to become more competitive and digitised, focusing on the SME integration in the EOSC DIH community with active participation, the successful adoption of innovative EOSC services by Industry. The second pillar includes the consolidated position of EOSC as a catalyst for innovative & disruptive solutions with economic and societal impact.

To achieve these objectives, it requires an effectively managed and sustainable EOSC DIH, that is able to expand the EOSC with added value services while integrating the EOSC in the pan-European DIH network and establishing a quality framework to ensure the continuous improvement of the EOSC DIH.

These two pillars cover the three general objectives of the EOSC DIH (matching the three main WP8 T8.2 Activities), with the specific objectives aligned and a set of operational objectives. This relation between the objectives is described in a 'tree of objectives' further developed with a list of Actions (Plan): Operation and Expansion; Business Pilot Support and Industry Innovation Activities; Monitoring and Evaluation System.

The latter objective was one of the identified challenges of the EOSC DIH after the experience in the EOSC-hub project as suitable KPIs and impact assessment across the wider DIH landscape were diverse and evolving. Lessons showed the need to define some KPIs that are more adapted to the scope, size, and funding mechanisms provided by the EOSC DIH. Therefore, this specific Activity has been newly created within EOSC Future to be focused on the design of these KPIs under a Monitoring & Evaluation System that will work for the quality assurance of the EOSC.

The definition of the Mission, Vision, Value proposition and Objectives of the EOSC DIH have been evolving since the launching of the EOSC DIH. The experience achieved in the past, the context of the new EOSC Future project, and the incorporation of new partners helped in the initial phase for this redefinition, though will surely be a continuous evolution as the EOSC evolves.

2 Introduction

This document presents the strategy and the activity plan for the EOSC DIH, keeping the focus on the EOSC as the added value to engage with the community. It is structured as follows:

- Section 3 summarises the main outcomes that were achieved during the initial period under the EOSC-hub project to understand the starting point, the background of the EOSC DIH, the main lessons learnt and the actions to take within EOSC Future, and a SWOT and PEST analysis where a wider framework has been analysed.
- Section 4 presents the Mission, Vision, Value proposition and Objectives of the EOSC DIH and an introduction to the community with the high-level strategy for stakeholder engagement and the community building strategy.
- Section 5 focuses on the activity plan to reach the objectives and the main resources, timelines, and tools required to achieve it. These activities are distributed in three main Activities:
  - Operation and Expansion, with the objective of effectively managing the DIH and the integration and collaboration with the EOSC ecosystem and the DIH network and other stakeholders.
  - Business Pilot Support and Industry Innovation Activity, focussed on running the campaigns and supporting the business pilots onboarded as well as companies who can offer solutions to the EOSC.
  - Activity for the Monitoring and Evaluation System, for a performance evaluation and quality assurance.
- Section 6 presents a summary of the KPIs.
- Section 7 collects final conclusions.
- Section 8 and Section 9 include Appendices with the description of the onboarding of new business pilot procedures and a summary table of the main operational objectives and actions.

3 Introduction to the EOSC DIH

3.1 Background: the EOSC-hub project

The EOSC Digital Innovation Hub (hereinafter EOSC DIH) was set up under the EOSC-hub project. It contributed to the project objective 'Widen the access to services to all user groups including researchers, high-education, business organizations and expand the user base'. The EOSC DIH was recognised as a Key Exploitable Result of the EOSC-hub project and was included in the DIH catalogue of the European Commission S3 Platform[1].

The EOSC DIH was (and still is) positioned as a principal mechanism for the direct engagement of business organisations (e.g. start-ups, SMEs, large enterprises) with the European Open Science Cloud (EOSC). The EOSC DIH specified its service offer with the intent to enhance the exploitation potential of commercially viable research data and existing e-Infrastructure services to the benefit of establishing business partnerships and/or business pilots. At the same time, it provided commercial organisations with both human and technical services to increase their digitization capabilities and support the move of new products or services onto the market. The initial set of services provided by the EOSC DIH was:

- **Technical**: services provided by national, regional, and pan-European digital infrastructures and include high-throughput computing, cloud compute, storage, and data management, among others. These were the main services initially provided to the business pilots, but later expanded.
- **Thematic**: services include data, advanced data brokering, and analysis capabilities provided by and for specific sectors.
- **Collaborative**: platforms for sharing digital objects like applications, pipelines, and virtual appliances.
- **Federation**: services enabling seamless operation, management and monitoring of distributed services across organisational borders.
- **Human**: providing support, consultancy, and training.

The long-term strategy of the DIH was to live well beyond the life of the EOSC-hub project and to be one of the main future mechanisms for industry to engage with the EOSC. This was reflected in all online and promotional material, and branding the DIH as the EOSC DIH: dedicated service offers; package of EOSC DIH logos; own website (www.eosc-dih.eu) and social media accounts (Twitter; LinkedIn); brochures; posters; reusable slide decks; video; entry to the EC DIH Catalogue, etc. In addition to the branding and dedicated online presence, a formal Terms of Reference was drafted outlining how the DIH could continue to operate outside of any single project as a number of initiatives will continue in the short-to-medium term (i.e. EOSC Future, EUHubs4Data, EGI-ACE). As the EOSC DIH matures into the future, thanks to the initial support from both project funding (EOSC-hub and EOSC Future) and organisational in-kind contributions, several business models were explored.

EOSC-hub partners were active in both event organisation and participation as well as running dedicated webinars on community gathered topics of interest, totalling around thirty (30) events. This included sessions within EOSC flagship events, where EOSC DIH business pilots were also present having won best demos and posters.

Regarding the business pilots, the EOSC DIH initially ran six (6) pilots with SMEs to kick-start business opportunities and later onboarded twelve (12) additional, for a total of eighteen (18) during the life of the EOSC-hub project. Five of these were obtained via an open call, offering service vouchers (not direct funding), which was held in the spring of 2020. New business pilots started to take advantage of a wider set of EOSC services beyond infrastructure-as-a-service and moved into requiring technological expertise, co-designing services using EOSC-hub services, and support and co-development with other projects.

Partnerships with other initiatives, projects, and regional DIHs were also sought as an additional means of both dissemination and achieving a multiplier effect, such as the flagship DIH coordination project DIHnet, Deep-Hybrid-DataCloud for augmenting the EOSC DIH service offering with artificial intelligence and machine learning services, OpenAIRE for metadata/publication related services, EOSC-Synergy for regional connections, amongst others.

[1] https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool

Several lessons have been learnt from the experience gained in 2018-2020 with an internal evaluation formulating recommendations for the future of both the EOSC DIH and the wider EOSC and DIH ecosystem. These include the challenge of identifying and involving the wider services and expertise from EOSC members not formally part of the DIH and the human resource requirements needed to support diverse SMEs. EOSC governance bodies have a broad range of topics that must be considered to ensure inclusion, with recognition in high-level strategic documents proving to be more difficult than expected.

Below there is a list of the recommendations for the broader EOSC and DIH ecosystem. In the section below, an overview of the lessons learnt is provided from the setup, development, and evolution of the EOSC DIH and an indication how the EOSC DIH task within EOSC Future (WP8 T8.2) plans to take them into account.

Recommendations for EOSC ecosystem:

- The EOSC offerings for collaboration with the private sector should be clear with **precise information about the access and usage or the process for the integration of services** in order to be more directly linked to the EOSC DIH offering. A friendly user experience should be required in the rules to become providers.
- Agreements with pilots (i.e. SLAs) should take into account the **availability of specialised support** in order to be realistic, as sometimes this can take longer than expected causing a mismatch with expectations of the pilots, as well as the timeline for the execution of a pilot.
- After three (3) years of the EOSC-hub project, the EOSC DIH should be considered a **principal interface between EOSC and industry**.
- The onboarding process of some of the services from SMEs (pilots) into the Marketplace was quite complex and time consuming. There should be an add-on in the **EOSC Portal procedure for onboarding pilots**, which formally involve DIH partners for validation (or at least the initial evaluation for the pilot labelled as EOSC DIH, should be more automatic).
- The EOSC DIH should be **widely disseminated as both an innovation and exploitation channel** in new initiatives and projects. It is an initiative open for new partners and partnerships and more explicitly mentioned in high-level EOSC documentation.
- **Accessing explicit data** required by pilots should be an area of improvement moving forward e.g. data provider agreements.

Recommendations for the DIH ecosystem:

- **Building a community** is one of the hardest processes in the creation of a DIH. The use of a platform/forum for the interaction between partners requires a lot of effort for keeping the people engaged. Available tools to keep the community active and engaged (e.g. Slack) and avoid starting from scratch should be considered.
- **Small and focused approach**: clear procedures for the internal organisation and the procedures for running pilots should be defined, taking into consideration that the management of multiple parallel experiments requires much human effort.
- **Open calls** are a good instrument to engage with industry and other stakeholders, but oftentimes legal and financial terminology limit the flexibility to conduct and promote different types of calls with different financial instruments.
- It is fundamental to have **metrics and KPIs** defined at the beginning of any pilot as introducing new metrics or KPIs once the pilot is running or at the end proves difficult or sometimes impossible to measure. In addition, the current impact assessments being carried out by external agencies or initiatives vary too greatly and do not seem applicable to small, short-term pilots. Input from DIHs will be important to evolve towards more standardised impact measurements.

3.2 Lessons learnt from the EOSC-hub project and EOSC Future Actions

After three years of working on the setup, development, and evolution of the EOSC DIH, there are several lessons learnt that can be seen from both the EOSC perspective and the wider DIH environment. The following section matches these lessons learnt with Corrective Actions (CA) to be implemented under EOSC Future.

From the EOSC perspective:

- The frequent comparison between EOSC with commercial offers and services shows the lack of visibility of the EOSC or knowledge about it.
  - **CA: Coordinate with appropriate marketing and dissemination teams/WPs of EOSC Future (i.e. WP10) to articulate EOSC's Unique Selling Point (USP) for commercial channels** (see *A1.7 Maintain the EOSC DIH website and social media channels and enlarge the user base* and *A1.7 Maintain the EOSC DIH website and social media channels and enlarge the user base*).
- The EOSC and the European Project-related terminology oftentimes is not clear or easily understood by anyone external to the ecosystem, especially industry.
  - **CA: Avoid/remove any EOSC- or project-related jargon from the DIH material and communication and use service-oriented and customer-friendly terminology instead** (see *A1.8 Create and disseminate communication material to targeted groups*).
- The EOSC is a quite complex and still evolving initiative and both characteristics do not help in the EOSC DIH development and its alignment.
  - **CA: Select only sufficiently mature EOSC concepts that will have obvious added-value to EOSC DIH customers** (see *A2.3 Conduct regular meetings and establish clear mechanisms with WP5 to identify and define the exploitation paths of EOSC services through the EOSC DIH*.).
- The EOSC needs to scale in operation, processes, and procedures not only within the DIH, but also how it connects to the wider EOSC community for the services and expertise required.
  - **CA: EOSC Future project aims to achieve just that. T8.2 will feed customer feedback from the EOSC DIH to other project WPs and collaborative EOSC projects to help align with these objectives** (see *A2.3 Conduct regular meetings and establish clear mechanisms with WP5 to identify and define the exploitation paths of EOSC services through the EOSC DIH*.).
- Industry has strict requirements and high expectations about the availability/reliability of the services and resources and sometimes academia/research is not able to fulfil them (thus affecting the EOSC DIH ability to meet them).
  - **CA: Provide DIH customers with high TRL EOSC services (where possible) and reliable data to ensure that they receive a production-grade level of service guarantee. Be more selective with the services provided** (see *A3.2 Identify and define strategic synergies with external multipliers as potential users of the EOSC DIH offer and EOSC exploitable results* and *A5.2 Provision and enable access to the requested EOSC services*).

From the DIH perspective:

- The EOSC DIH has a significant human component. When working with and orienting SMEs toward the research landscape, there is the need to learn/adjust the tasks to how things work in academia.
  - **CA: Assign specific roles to the EOSC DIH team members supporting the SME pilots, based on their expertise and prior experience in service provisioning segments and/or collaborating with the private sector** (see *A1.1 Define roles and responsibilities for the EOSC DIH team*).
- The distributed resources and the diverse innovators and their added value services require that the DIH must face multiple challenges. Going from six (6) to eighteen (18) pilots is not about just better marketing/dissemination, it requires full commitment and strong coordination and communication.
  - **CA: Available resources within the EOSC Future project provide the necessary means to achieve full commitment and strong coordination and communication.** (see *A1.2 Define clear procedures*

and rules for the EOSC DIH operation and activities, *A1.4 Monitor human and technical resources allocation and usage* and *A1.6 Organise and conduct regular management team meetings*).

- The evaluation of available platforms for collaboration in the DIH was done in the beginning of the EOSC-hub project, to reuse available platforms. Several of the available solutions to be reused were too heavy or did not really address the user's potential expectations. DIHWARE, a tool developed by Engineering was investigated; however, due to high maintenance and license costs and a very low user experience and usability, its adoption was dropped. The use of a simpler own solution based on WordPress was agreed. It provides a channel for automatic notification about most important information to users and does not introduce additional overhead.
  - **CA: Select and deploy a mature, simple, and widely-accepted existing collaboration tool (e.g. Slack, Confluence)** (see *A1.5 Set up and maintenance of collaborative tools (mailing lists, repositories*).
- Open calls for pilot activities are a good opportunity to mobilise different types of organisations working on a variety of topics/domains. However, although equity-free financial support is more appealing to the business community, and a voucher-based access to services/support (as done in the EOSC-hub open call) can attract interest, there is still a requirement for the services themselves to be clearly and sustainably funded. This type of initiative will normally generate significant interest in the business community and is a relevant activity to generate broader awareness about the DIH.
  - **CA: Onboarding stakeholders through a mix of value exchange contributions through business pilots and direct economic opportunities through the purchasing of services will engage these actors over a longer period of time, which can help foster a greater participation in the community** (see *A2.2 Conduct the appropriate purchasing mechanism to onboard innovative services enhancing the EOSC and EOSC DIH* and *A4.2 Evaluate candidates according to the EOSC DIH strategy and the service offer*).
- The EOSC DIH is an EU network, rather than a regional focus. Though the EOSC DIH is sector agnostic, which implies wide opportunities to collaborate in the EDIH corridors, but under the current EDIH framework definitions, will not be able to be officially recognised as one.
  - **CA: As the trend is for DIHs to specialise in order to be competitive and customer-focused, the EOSC DIH can also consider specialising in some EOSC thematic areas, at least for the EOSC Future timeframe. In the medium-term, introducing more formal thematic task forces or subgroups within it might be considered. In the long-term, monitor the potential to spin out sub-EOSC DIHs, each one addressing a different (EOSC) thematic priority** (see *A4.1 Run campaigns for business pilots*).

- The European DIH communities evaluate the impact of the different DIHs in a quantitative way (e.g. number of new employees, rise in benefits, new patents generated working with the DIH) with very high expectations that are hard to reach for SMEs and start-ups.
  - **CA: Use an alternative, practical, and easy-to-measure framework for monitoring SME progress within the timeframe of the EOSC Future project. Specifically, in order to evaluate and measure in a systematic manner the level of contribution/impact of EOSC DIH support to the SMEs, several Innovation Readiness Levels can be monitored and measured, especially the extent they could increase owing to the EOSC DIH support** (see *A7.2 Define the indicator framework and KPIs*).
- The first-round of business pilots were supported by the EOSC-hub project with direct funding to cover the experiment costs, while the second round only was offered with in kind support. These differences, in addition to the different sectors and technologies covered, were the outcome of the inability to define clear standards/KPIs and the baseline for the assessment of the impact. Other DIHs or initiatives related to DIHs, most of them with sector and regional focus, suggested heterogeneous impacts assessment indicators, not clearly suitable for the type of experiments supported by the EOSC DIH.
  - **CA: Use a measurement framework (i.e. the one suggested above with the Innovation Readiness Levels) that is agnostic to that type of support offered (funding, in-kind, etc)** (see *A7.1 Refine the EOSC DIH objectives tree and intervention logic* and *A7.2 Define the indicator framework and KPIs*).

3.3 SWOT and PEST Analysis

3.3.1 SWOT analysis

The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats), a tool for setting the basis for a reflection on the strategy to follow, contributes to the analysis of the previous experience of the EOSC DIH and it is presented as follows:

Table 3-1: SWOT Analysis

Strengths	Weaknesses
• Strong skills on advanced computing and data services. • Wide network of infrastructure resources. • Wide network of EOSC technology experts available. • Founding Partners and new partners from EOSC Future are well connected to the EOSC ecosystem. • In kind effort from partners and projects to complement the direct funding. • Connections with other Digital European Hubs across Europe. • Broad range of services available (Piloting, Technical support, Training and Visibility) is aligned with the European Commission directive.	• Distributed partners increase overhead. • Lack of direct involvement of regional clusters. The pan-European approach facilitates the global EOSC collaboration, but not as much regionally. Some local connection is needed to understand the sectoral and technological needs. • Not fully integrated yet with EOSC Portal. Some experiences with previous pilots suggest that more connection is needed to make the access to the services more agile. • Complexity of EOSC ecosystem and evolving state that could imply significant impact in the EOSC DIH strategy and actions.
Opportunities	**Threats**
• EDIH corridors to boost the collaboration with other DIHs in Europe and regional connections with sectoral clusters. • Strong support and promotion of the innovation activities in the different regions by governments to help in the engagement with regional industry. • Increasing support from Universities and research entities to promote industry collaborations. • The external organisations' clear interest in the EOSC DIH can be used to onboard and increase the DIH value and offering. • Participation (directly or indirectly) of other organisations (e.g. incubators, multipliers, P2P investments, business angels) could increase relevance/position of the DIH. • Partnerships with other projects, initiatives can increase value proposition for EOSC DIH customers.	• Multiple initiatives and innovation support opportunities may cause competition to involve SMEs. • SMEs are more risk averse to innovate in an unpredictable economic situation. • Distribution of efforts for industry collaboration among the EOSC. The EOSC DIH should be considered the main collaboration opportunity between industry and EOSC and try to not duplicate efforts. • Lack of specific European funding opportunities and/or capacity to attract funding to finance DIH activities due to the EOSC related and global approach. Business models will need to be explored.

3.3.2 PEST analysis

The PEST analysis for the DIH covers the external political, economic, societal, and technological factors at a European scale that could affect the work of the EOSC DIH and the achievement of its objectives.

Table 3-2: PEST Analysis

Political	Economic
• EC shifting DIH focus on a national/regional level. • EOSC governance is evolving with a number of different structures and the need to coordinate. • Regional governments need incentives to participate in EU level activities. • The Digital Single Market is the main EC initiative to share and boost the competitiveness of Europe by boosting cross-border cooperation and transactions. • Digital development is deployed at different speeds in Europe. • EU high interest on AI, HPC and cybersecurity to compete with main actors (USA, China).	• The EC has a clear position on supporting DIHs. The Digital Europe Programme is the main mechanism to fund EDIHs in addition to Horizon 2020/Horizon Europe Coordination and Support Actions. • The COVID breakout and lockdown had a high impact on the SME economy. • Funding and overall business models are required to support the running and expanding of the EOSC DIH itself. • Available funding mechanisms for data-driven innovation to contribute to the European Green Deal (Climate Change) and the Digital Transformation, some of the main challenges of the EC work programme for the years 2019-2024.
Social	**Technological**
• Digital natives already in the workforce facilitates the creation of digital based start-ups and the openness to advanced technologies. • Most traditional SMEs still have a slow adoption of new technologies with a lack of digital skills. • Society committed with science and the fact that digitisation contributes to political and economic support for innovation.	• Increase in commodity technologies forces a shift to value added services. • Maturity and ease of use of EOSC services are required to meet industry needs. • Deluge of EOSC services requiring high levels of filtering.

The lessons learnt and the actions to take in addition to the SWOT and PEST analysis have been analysed and taken into account when discussing the overall strategy of the EOSC DIH in this initial phase of the EOSC Future project. These observations have been considered to define the objectives in the Section 4 and resulted in valuable input to prepare the Action Plan covered in Action Plan.

4 Mission, Vision, Value and Objectives of the EOSC DIH

The EOSC DIH was created under the EOSC-hub project with the overall goal of a Digital Innovation Hub (DIH) to 'help SMEs become more competitive by providing companies with access to technological facilities, identifying technical solutions, and raising their level of awareness of how digital technologies can increase the competitiveness of their companies' as described in EOSC-hub Deliverable 9.2 Digital Innovation Hub Introduction and Strategy[2]. The value proposition was previously stated that 'the EOSC Digital Innovation Hub was a multi-dimensional entity that allows research e-Infrastructures to support business organisations to stimulate the innovation potential of research infrastructures, as well as helping SMEs, start-ups, and other innovative actors to tap into the academic world both in accessing knowledge as well as technical services'. The final goal was to create a one stop shop that brings IT services, research data, and expertise into a single place to support innovation in industry. The four (4) pillars that summarised the value proposition were:

- The brokerage and innovation
- Provide the means for business incubation of innovative ideas
- Access to public and private funding and facilitate market uptake
- Support entrepreneurship; and Training

The lessons learnt from the EOSC-hub project described in Section 2 have been the starting point for the refinement of the Mission, Vision and Objectives of the EOSC DIH. When considering the EOSC DIH itself, lessons learnt showed the need to strengthen the EOSC DIH in roles and procedures; when considering the interface with the EOSC, lessons suggest that the EOSC DIH should be consolidated and recognised by the EOSC ecosystem as one of the main mechanisms for industry engagement including more mature services and service descriptions in the EOSC DIH offer and increasing the collaboration at all levels, from EOSC Future WP inter-relations, EOSC related projects, up to the EOSC Governance Board; when considering the interface with Industry, lessons include the need to generate an active community, providing a real added value with useful tools and mature services and being able to measure the impact generated.

The lessons learnt helped in the refinement process of the Mission, Vision and Objectives of the EOSC DIH, which the main purpose is to offer innovative EOSC services to SMEs to improve their competitiveness while contributing to the industry engagement to improve the EOSC. The value proposition has been refined to really focus on the real distinction of the EOSC DIH from others. Next sections provide further details on this.

4.1 Mission and Vision

Mission

Support **European SMEs** in becoming more **competitive** and **digitised** by providing a **single access point** to mature **EOSC services**, **research data**, and **expertise**, and serving as a sustainable **innovation catalyst** for industry to contribute to the provision of solutions for the benefit of EOSC, thus ultimately helping to remove the barriers between **Open Science** and **Industry** and facilitating the integration of EOSC services**.**

Vision

EU companies become more competitive and digitised and EOSC is seen as a catalyst for more innovative and disruptive solutions with economic and societal impact.

Value Proposition

For industry to remain competitive, it must continuously innovate and increase digitisation, but sometimes there is a lack of knowledge and an environment to experiment. The EOSC DIH is a multi-organisation entity that allows SMEs and start-ups to tap into the academic world by both accessing knowledge as well as technical services, while enabling business organisations to stimulate the innovation potential of EOSC stakeholders. The final goal is to solidify a one stop shop that brings EOSC services, research data, and expertise into a single place to support industry innovation activities.

[2] https://documents.egi.eu/public/RetrieveFile?docid=3345&filename=EOSC-hub%20D9.2%20v1.1%20Approved%20by%20EC%20Public.pdf&version=6

The **real added value of the EOSC DIH relies on the direct connection with the EOSC services and environment, with excellent research services and infrastructures**. On the other hand, it offers a **pan-European approach, because the EOSC DIH was already designed as a distributed initiative** with mechanisms and processes defined for establishing an easy cooperation with the EOSC ecosystem that would be exploited in the near future with the EDIHs.

4.2 Objectives tree of the EOSC-DIH

The EOSC Digital Innovation Hub (DIH) responds directly to the EOSC Future *General Objective 5: Enable Innovation with SMEs and Industry through Procurement of Commercial Services and EOSC Digital Innovation Hub*. Together with WP1 T1.5, WP4, WP5, WP6 and WP8 T8.1, it addresses the project specific objectives to:

- Select, prioritise, and procure relevant services from the commercial sector to deliver missing functionalities.
- Provide dedicated support to SMEs and industry.
- Promote participation of the commercial sector in EOSC to increase both the supply and demand sides.

Reflecting the strategic concept of a Digital Innovation Hub, the EOSC DIH will act as a bridge between the EOSC research community and the private sector, in particular SMEs. It will function as a primary EOSC Future industry engagement channel.

Building upon and expanding the activities in the EOSC-hub project (2018-2020), the EOSC DIH will collaborate with private sector entities to stimulate an ecosystem of innovation and knowledge transfer. Going beyond the aim of fostering the development of commercial services to continuously cover the needs of the EOSC research community, the EOSC DIH aims at facilitating and supporting the market launch of new products and services, thanks to the access provided to EOSC computing resources, data, and scientific services. The EOSC DIH services range from piloting and co-design, technical service provision, training, and consultancy as well as providing visibility opportunities at a European level, an aspect needed for small companies to grow. These support activities should speed up the innovation cycle, bringing competitive advantages, thus enabling the reduction of the time needed to experiment new business ideas building on research outputs and to go-to market resulting in societal/economic impact (financial and jobs), innovation impact (products and services).

The diagram below sets out the general (strategic) and specific objectives of the EOSC DIH, and how the EOSC DIH intends to reach these objectives through its operations. The Action Plan set out in Section 5 describes the EOSC DIH operations in further detail.

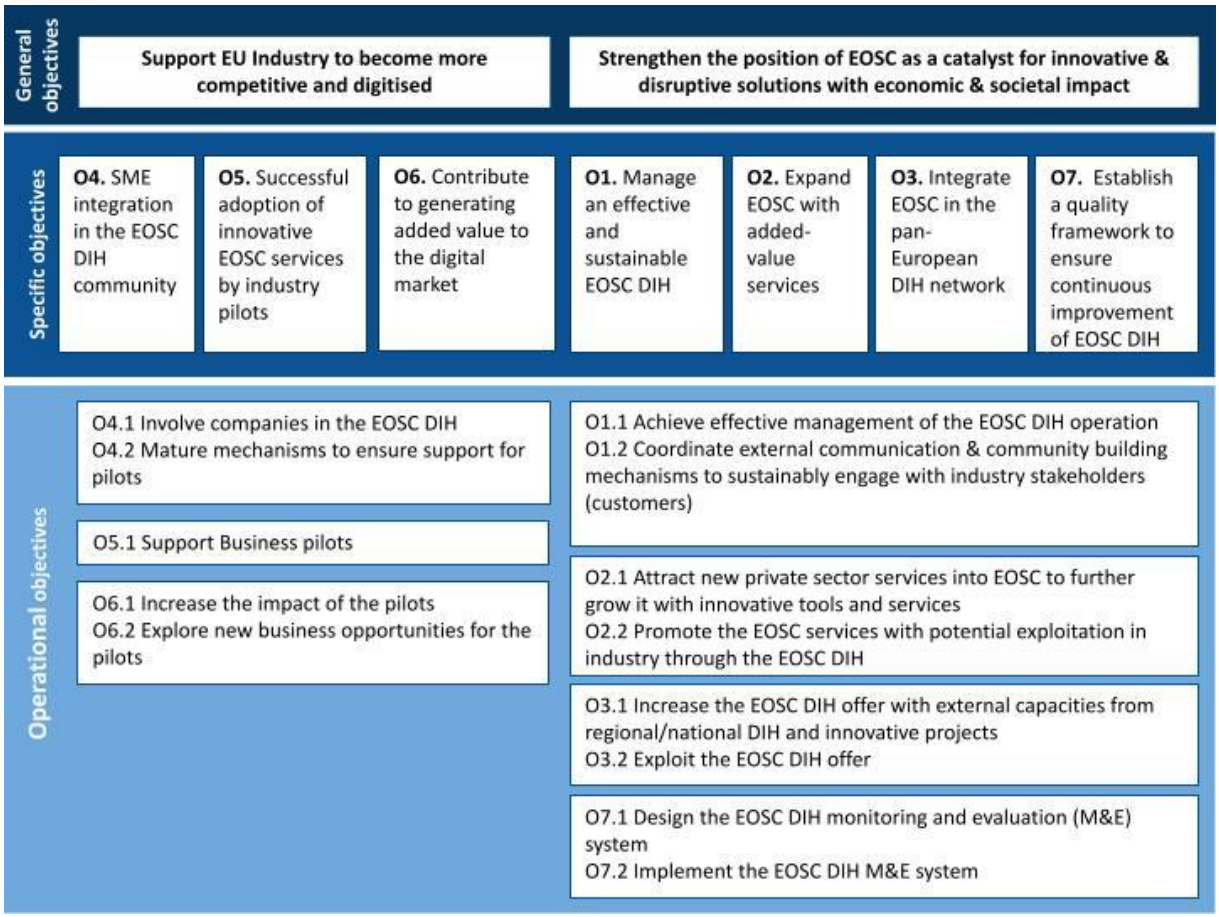

Figure 4-1: Objectives' tree of the EOSC DIH

4.3 Definition of services

The service offer has evolved since the EOSC DIH creation, and its initial set of services previously described in section 3.1.

The value proposition of the EOSC DIH can be summarised in 4 key areas:

- **Piloting and co-design**: an environment to experiment where services or products can be designed and tested and where proofs of concept are carried out.
- **Technical Assets**: offering data analytics, advanced modelling and simulations, process optimization, quality improvement, decision making support as well as HPC, HTC and Cloud access, implementation of best practices and prototyping of Artificial Intelligence enabled services or data management. The technical assets are offered via different mechanisms and partnerships within the EOSC Ecosystem.
- **Consultancy and training**: analyse and assess the technological-readiness of SMEs and explore the best IT solutions for their needs, supported with training on digital skills, coaching, and support for commercialization.
- **Visibility-building ecosystem**: a cross border innovative environment to increase the visibility of SMEs.

Figure 4-2: Services of the EOSC DIH

In addition to the general services offered by the EOSC DIH, partnerships with other EOSC related projects allow the EOSC DIH to offer external services and technical assets that complements its offer:

- **DEEP Training Facility**[3]: A training facility environment for Artificial Intelligence, Machine Learning, and Deep Learning models initially developed by DEEP HybridDataCloud and now part of EGI-ACE.
- **MiCADOscale**[4]: A TOSCA-based orchestration and auto-scaling framework for Docker, orchestrated by Kubernetes, facing the cloud resource orchestration's issues in the multi-cloud landscape.
- **EGI-ACE**[5]: The project delivering the EOSC Compute Platform and contributing to the implementation of the EOSC Data Commons with Data Spaces and Analytics, Platforms, Federated Access, and Federated Resources.
- **DICE**[6]: Solutions for increasing the quality of data and their re-usability, supporting long-term preservation, managing sensitive data, and bridging between data and computing resources.
- **Leadership4SME**[7]: Platform of specific tools to strategically manage and place IPR in the business model and plan to attract funding, generate business, and encourage collaborations.
- **OpenAIRE-Nexus**[8]: Onboards fourteen data services, provided by public institutions, e-Infrastructures, and companies, structured in three portfolios: PUBLISH, MONITOR and DISCOVER.

MiCADO and Deep were incorporated in the final phase of EOSC-hub project while the others have been incorporated in the recent months (during EOSC Future) once the EOSC DIH established formal agreements with the providers. Conditions for it use are agreed independently for each use case. These kinds of collaborations will be continuously explored and integrated over the course of EOSC Future.

4.4 Target Audiences - Community

The EOSC DIH ecosystem is built by the EOSC DIH community and the stakeholders or entities with interest or relevant influence in the execution of the EOSC DIH activities. The following figure shows the map of these entities.

[3] https://marketplace.eosc-portal.eu/services/deepaas-training-facility)
[4] https://cloudsme.eu/
[5] https://marketplace.eosc-portal.eu/services?related_platforms=52&page=2
[6] https://www.dice-eosc.eu/
[7] https://leadership4smes.eu/resources/
[8] https://www.openaire.eu/openaire-nexus-project

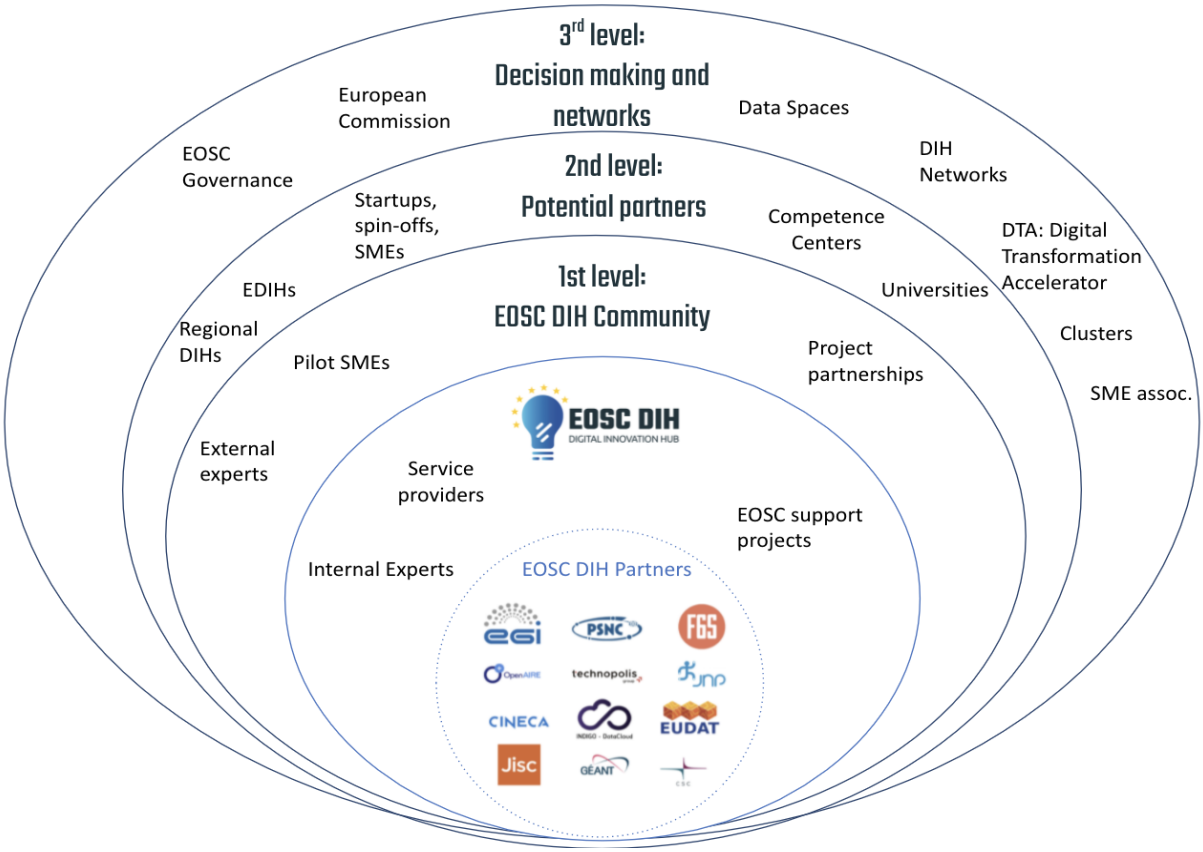

Figure 4-3: The EOSC Community and Stakeholders map

- **Zero level: EOSC DIH**. The people, entities and projects that allow the EOSC DIH to work. This core level includes the main EOSC DIH partners (starting with those entities with effort in EOSC-hub and EOSC Future projects), other internal experts, service provider members, and the EOSC support projects (previously EOSC hub project, currently the EOSC Future project) expanded by those agreeing to the Terms of Reference.
- **1st level: Members of the community**. The running pilots, the experts offering services to the pilots and the partnerships that participate in the regular activities and meetings that the EOSC DIH organises.
- **2nd level**: **Potential partners**. The companies, SMEs, spin-offs, clusters of companies or companies from other DIHs that would require or need the services of the EOSC DIH, and the entities, competence centres (CC), universities, external experts, and other DIHs that could provide complementary services to the DIH.
- **3rd level**: **Decision making and networks**. The policy making entities and DIH networks that support mechanisms for implementing the activities, existing and future.

Based on the interest that these entities have in the EOSC DIH, an added value for each level has been created and proposed below identifying **specific engagement strategies**:

Table 4-1: Value proposition for partners and engagement strategies

Stakeholder	Examples	Value proposition	Engagement strategies
Zero level: EOSC DIH partners and internal providers			
- EOSC DIH partners - Internal experts	- EGI, PSNC, F6S, CINECA, INDICO, EUDAT, CSC, OpenAIRE, Technopolis	DIH as a complementary mechanism to collaborate with other EOSC partners on industry	Keep them committed Keep them motivated Keep them active

- Internal providers	Group, JNP, JISC, Geant. - EOSC Future Consortium	engagement to promote innovation activities	Keep them informed
First level: Members of the community			
- SMEs running pilots	- Ecohydros, Moxoff, Yottacle, Kings Distributed Systems, Koma Nord, Idego, Bentley, Hidronav, Suite5, Kampal, BI Insight, Axyon, ErasmusPlay, Collabwith, Ibisa, Muon Systems, Netservice, BBC, DEIP, OdinS, CloudSME, Agilia	- Single point to innovate (tech + funding + skills) - Access to advanced computing and data infrastructure and tech support - Pan-European visibility	Keep them active Keep them motivated Keep them informed Keep them part of broader thing Keep them consulted
- External experts - Partnerships	- DEEP, CloudSME, DICE, EGI-ACE, C-SCALE - SoBigData, EOSC Synergy, EUTOXRISK, BigDataStack	- Matchmaking tools to facilitate and simplify collaborations with Industry - Exploitation mechanism for the partnership projects towards SMEs - Income tool	Keep them committed Keep them informed
Second level: Potential partners			
Start-ups, spin-offs, and SMEs	- Start-ups - Spin-offs from academic partners from EOSC Future project	- Single point to innovate (tech + funding + skills) - Access to advanced computing infrastructure and tech support - Pan-European approach and networking - Support to get them involved as suppliers for the EOSC	Keep them informed Keep them invited Keep them consulted
Regional DIHs and EDIH	https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool	- Complementary pull of services and pilots	Keep them informed Keep them involved in networking activities
External experts, Universities and CC	BDVA, EUHubs4Data	- Matchmaking tool to facilitate and simplify collaborations with industry - Mechanism to engage with EOSC	Keep them informed Keep them involved in networking activities
Third level: Decision makers and networks			
EOSC Governance	EOSC Association, Executive Board, Working groups	- Mechanism to provide innovation into the EOSC ecosystem	Keep them informed Keep them committed
European Commission	DG Connect	- Mechanism to boost digitisation and innovation in Europe to become more productive	Keep them informed Keep them committed
Data Spaces	To be defined in the next Horizon Europe and Digital Europe calls.	- Mechanism to collaborate and exploit data	Keep them involved in networking activities
DIH networks and CTA	DIHNET.eu, EU Robotics, AI Alliance, TNO, Leadership4SMEs.	- Pan European DIH to establish collaboration among countries and corridors	Keep them involved in networking activities
Clusters and SMEs associations	Enterprise Europe Network (EEN), Regional Cluster (at least Netherlands, Italy, Spain, Greece, Poland)	- Matchmaking tool - Gateway to collaborate in Europe	Keep them informed Keep them involved in networking activities

The engagement strategies suggest the level of participation and involvement in the activities, and they are described as follows:

- **Keep them committed**: Expect people to be committed by collaborating and contributing with resources (human, technical or financial) towards guaranteeing the sustainability of the EOSC DIH.
- **Keep them motivated**: Expect people to share the Vision and Mission of the DIH, and happily contribute to shaping the future with a participatory approach.
- **Keep them active**: Expect people to regularly contribute to achieve the objectives by participating in the activities proposed or organised and positively answering to requests for collaboration.

- **Keep them part of a broader thing**: Expect people to experience the sense of belonging to a community, to be members of a team.
- **Keep them consulted**: Expect people to be actively involved in consultations, questionnaires or surveys conducted to collect information with the purpose of defining or shaping future strategies.
- **Keep them involved in networking activities**: Expect people to participate in the proposed networking activities to facilitate the interaction with stakeholders.
- **Keep them informed**: Expect people to receive, analyse and share the information about the DIH.

4.4.1 Community building strategy

For those levels of stakeholders, there are different phases to consider when creating a community and can be summarised as follows:

- **People:** Keep the community full of people, if we don't have them, how are we going to look for them?
- **Engagement:** How are our people going to be engaged? How will we communicate with them?
- **Interaction:** How does the EOSC DIH facilitate interaction between the members and create collaborations?
- **Value:** How does the community share knowledge and support each other?
- **Impact:** How do we facilitate our community and can create innovation through collaborations and bring ideas into the market?

The following table summarises the process on *How to facilitate the community dynamics* applied to the EOSC DIH considering the different levels of engagement.

EOSC DIH DIGITAL INNOVATION HUB	EOSC DIH	1st level: EOSC DIH Community	2nd level: Potential partners	3rd level: Governance
People Our community has to be full of people, not empty	Define clear roles and responsibilities. Visibility of members (web and social media)	Join pilots through Open calls. Start partnerships. Make community visible (website and social media).	Create EOSC DIH awareness (Social Media, partnerships)	Create EOSC DIH awareness (Social Media) and EC catalogues, events.
Engagement Our community has to read our emails, comment in our messages and follow us in different social networks	Regular meetings Delegation of tasks Annual F2F meetings	Newsletter Mailing list Social media	Fairs and Conferences Mailing Social media	Fairs and conferences Participation in Project proposals
Interaction Our community has to network among members and create collaborations and activities together.	Promote joint participation on tasks Shared workspace	Share the Code of conduct Make SMEs visible and share contact details Forum (fail)	Joint participation in Open Calls and proposals Mailing Social media Events	Share news and outputs (Mailing and Social Media) Participation in Events
Value Our community has to share the knowledge, share news and support each other.	Sharing of knowledge Active participation on events	Webinars /demos sessions led by SMEs Services included in the EOSC Marketplace	Participate in common spaces, platforms. Share funding and collaboration opportunities Share services Share news and main results.	Participation on Conferences. Share of success stories, lessons learnt and collaborations. Participation on DIH Policy roadmaps. Participation in proposals
Impact Our community needs to create innovations through collaborations and bring ideas onto the market.	Open for feedback and continuous internal Improvement mechanism	Running pilots and share of outputs through EOSC channels	Share the Success stories in sectors Bring new projects and pilots to run	Share the Success stories in sectors Include services in EU catalogues Share our KPIs

Figure 4-4: Community building strategies

5 Action Plan

The Action Plan described in this section has been defined as the executive mechanism to reach the general objectives described in Section Objectives tree of the EOSC-DIH. The EOSC Future WP8 Task 8.2 consists of the three Activities that cover:

- Activity 8.2.1: EOSC DIH operation and expansion, connection to other DIHs and support to EOSC-related and EC projects for industry engagement within the context of EOSC.
- Activity 8.2.2: Business pilot support and industry innovation activities.
- Activity 8.2.3: EOSC DIH Monitoring and Evaluation System.

For each Activity, a list of specific objectives and operational objectives have been described (overview already shown in Section Objectives tree of the EOSC-DIH) in the Table below with a list of actions to achieve these objectives.

5.1 Activity 8.2.1 EOSC DIH operation and Expansion

This Activity implements 3 specific objectives to create an appropriate space for the effective operation of the DIH and to establish the mechanism for contributing to growing the EOSC and its integration with industry as well as the integration in the European DIH landscape. The specific objectives can be summarised as follows:

- O1. Manage an effective and sustainable EOSC DIH
- O2. Expand EOSC with Value-Added Services
- O3. Contribute to the pan-European network of DIHs

For these specific objectives, a set of operational objectives and a set of actions haven been defined as described below:

Table 5-1: Specific objectives, Operational objectives, and Actions under Activity 8.2.1

Specific Objectives	Operational Objectives	Actions
O1. Manage an effective and sustainable EOSC DIH	O1.1 Achieve effective management of the EOSC DIH operation	A1.1 Define roles and responsibilities for the EOSC DIH team. A1.2 Define clear procedures and rules for the EOSC DIH operation and activities. A1.3 Define the timeline for main activities and supervise deliverables and milestones. A1.4 Monitor human and technical resources allocation and usage. A1.5 Set-up and maintenance of collaborative tools (mailing lists, slack, confluence, repositories). A1.6 Organise and conduct regular management team meetings.
	O1.2 Coordinate external communication and community building mechanisms to sustainably engage with Industry stakeholders (customers)	A1.7 Maintain the EOSC DIH website and social media channels and enlarge its user base. A1.8 Generate and disseminate communication material to target groups. A1.9 Organize and attend events/conferences and industry related fairs. A1.10 Analyse sustainability models
O2. Expand EOSC with Added-value Services	O2.1 Attract new private sector services into EOSC to further grow it with innovative tools and services	A2.1 Explore industry services of EOSC DIH community or other industry opportunities to be onboarded or integrated in the EOSC. A2.2 Conduct the appropriate purchasing mechanism to onboard innovative services enhancing the EOSC and EOSC DIH.
	O2.2 Promote the EOSC services with potential exploitation in industry through the EOSC DIH.	A2.3 Conduct regular meetings and establish clear mechanisms with WP5 to identify and define the exploitation paths of EOSC services through the EOSC DIH.
O3. Integrate EOSC in the pan-European DIH network	O3.1 Increase the EOSC DIH offer with external capacities from regional/ national DIH and innovative projects.	A3.1 Develop partnerships for integrating technical offers into the EOSC DIH, and into the EOSC Marketplace when appropriate.

	O3.2 Exploit the EOSC DIH offer	A3.2 Identify and define strategic synergies with external multipliers as potential users of the EOSC DIH offer and EOSC exploitable results. A3.3 Participate in European networks and alliances as well as actively contribute to events and conferences (International, National, and regional level).

5.1.1 O1.1 Achieve effective management of the EOSC DIH operation

This objective aims to ensure efficient management of the EOSC DIH by defining the roles and responsibilities for the members with a number of procedures and mechanisms to contribute to the operational activity, while monitoring the correct use of resources and supervising the outputs generated under the tasks and ensuring they are delivered on due time.

5.1.1.1 A1.1 Define roles and responsibilities for the EOSC DIH team

This action focuses on defining the main roles of the EOSC DIH to achieve the objectives and to execute the activities with the human support needed. The following roles and responsibilities have been identified:

Subtask leaders: Subtask leaders will manage the main operation activities under their subtask, organising regular meetings as needed and fulfilling the documentation, deliverables, and reports associated with their subtasks.

- The role of the Activity leaders are covered by:
  - Activity 8.2.1 EOSC DIH Expansion and Operation, Sy Holsinger (EGI Foundation)
  - Activity 8.2.3 Business Pilot Support and Industry Innovation, Marcin Plociennik (PSNC)
  - Activity 8.2.3 Impact Assessment and Exploitation, Bea Mahieu (TGB)

General T8.2 Support: The subtasks defined above require human resources to be executed. Subtask support staff will participate in regular meetings, will support the regular activities of the EOSC DIH, and will support the subtask leaders in the collection of information and preparation of report documentation.

Communications team: The communications team will work on the main dissemination and communication activities associated with the EOSC DIH and other relevant industry related topics (news, social media, website updates) and will directly liaise with WP10, who will provide overarching project communication processes and procedures as well as act as an amplifier. The DIH communications team will organise the main activities with the EOSC DIH community (regular meetings, feedback surveys).

Technical Support: The technical team will work in the technical support for the pilots (provision of services) and in the technical work for internal tools of the EOSC DIH (website development, integration of tools).

In addition to these main roles for the general work of the DIH, the following roles have been defined when supporting business pilots:

- **Pilot lead:** Main EOSC DIH contact for the SME running the pilot, the person responsible for the execution and achievement of the goals, and who will coordinate the technical, business, and training offered to the company.
- **Technical coordinato**r: Lead technical consultancy and support activities.
- **Internal experts**: Support the execution of experiments by providing knowledge, consultancy, or training in different topics (technology, business, access to funding) when needed.
- **External Experts**: Experts from external organizations will be involved in the DIH when the knowledge is not available inside the community.

The following scheme shows the roles and actions of the main actors when running a pilot.

Phase	Pilot definition	Tech requirements	Assignment of experts	Running a pilot	Visibility	Networking	Training	Market analysis	Investment consultancy
Actions	Description of pilot. Identification of objectives and needs.	Identification of services required and Tech required	Personalized brokerage of services and support experts	Sprints of the pilot execution. Regular meetings with the tech coordinator.	Participation on conferences Digital visibility with digital material and social media.	Join the EOSC DIH community to interact and collaborate with other Pilots. Participate in joint vents.	Training pills and specific support for the community needs	Market prospection and exploitation of pilot results. Access to the EOSC Marketplace	Explore Funding mechanism to support the results of the pilot.
Main Actor	Company	Company	Pilot lead	Company	Pilot lead	Company	Training experts	Pilot lead	DIH funding experts
Collab /support		Tech coordinator	Tech coordinator Tech experts	Tech coordinator	Company	Pilot lead	External experts if needed	Company	External experts if needed

Figure 5-1: Steps and roles when running a pilot

5.1.1.2 A1.2 Define clear procedures and rules for the EOSC DIH operation and activities

Several procedures have been defined and put in place to guarantee the efficient management and coordination of the EOSC DIH. Currently, the procedures and rules identified are the following:

- **Onboarding new pilots**: This procedure allocates the resources needed to support new pilots. The procedure describes the steps required from the initial contact with the company until the project is finished, disseminated, and all administrative updates completed. An initial description of the procedure is included in **Appendix A: Onboarding new pilots' procedure.**
- **Participation in events and fairs**: This procedure analyses the interest of different meetings and fairs for the EOSC DIH and allocates the resources needed to attend the events aligned with the procedures in WP10. It describes the steps from the potential event is identified until it is attended and disseminated.
- **Collaborations and partnership**s. This procedure analyses the interest in establishing collaboration or partnerships with other initiatives, projects, clusters or DIHs. It describes the steps from the time a potential partner is identified until the agreement is signed/approved.

This activity will add or modify any procedure as requested and agreed by the WP8 T8.2 members and will be properly communicated under the internal communication channels.

5.1.1.3 A1.3 Define the timeline for main activities and supervise deliverables and milestones

The main goal of this action is to schedule the main activities of the project, considering the deadlines for submitting the deliverables and achieving the milestones while supervising their execution and overall project timeline. The following deliverables and milestones are related to the work conducted in WP8 T8.2:

Deliverables:

- **D8.4 - EOSC Digital Innovation Hub Strategy and Plans (EGI, M4->6, R, PU)**: Covers the strategy and overall plans for the expansion of the EOSC DIH, including the monitoring and evaluation system.
- **D8.5 - Digital Innovation Hub Final Results and Sustainability Plan (EGI, M29, R, PU)**: Final report of overall EOSC DIH activities, including business pilots carried out, technical support provided, and assessment of results achieved.

Milestones:

- M6.6 Business Pilot Success Stories published (MS36) Published on EOSC Portal.

The table below shows the timeline for the overall project and the main priorities for each subtask considering the deliverables and milestones.

	2021			2022				2023		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
T8.2.1	Set up tools Onboard community Strategy for purchase of services	Strategy Campaign for Pilots Comms & Events Deliverable	Research on EOSC needs Requirements for purchasing services Comms & Events	Comms & Events Launch purchase of services #1	Mid project report EDIHs collaboration Comms & Events	EDIHs collaboration Comms & Events	Comms & Events Launch purchase of services #2	Expl & Sust. Comms & Events Launch purchase of services	Expl & Sust. Comms & Events Deliverable	Comms & Events Final reports Deliverable
T8.2.2	Strategy Initial new pilots analysis	Campaign for Pilots #1 Deliverable	Evaluation Pilots running	Pilots running	Pilots running Services contracted tech support	Business success stories Campaign for Pilots #2	Evaluation Pilots running	Pilots running Services contracted tech support	Pilots running Deliverable	Business success stories Deliverable
T8.2.3	Strategy	Strategy M&E set-up tools Deliverable	Design of the M&E System Internal reporting	Monitoring	Monitoring First Monitoring Report (internal)	Monitoring	Monitoring Second Monitoring Report (internal)	Monitoring	Monitoring Third Monitoring Report (internal)	Evaluation Deliverable
Deliverables and Milestones		D8.4								D8.5 M6.5

Figure 5-2: Timeline for Deliverables, Milestones, and main activities during the project period

5.1.1.4 A1.4 Monitor human and technical resources allocation and usage

In order to guarantee the appropriate use of resources, both technical and human, the monitoring of resources will be performed on a regular basis.

The allocation of pilots among the different service providers will be distributed accordingly to the pilot requirements and the resource provider availability and conditions. The terms for the use of technical resources and services will be agreed with each company, according to the pilot requirements, but also considering the resource provider availability. The consumption of resources will be regularly assessed and will be shared internally for monitoring.

The human resources reported for the execution of the different subtasks will be monitored on a year basis following the interim reports of the project. Major deviations will be directly managed by the EOSC DIH coordinator and communicated to the WP8 Manager.

5.1.1.5 A1.5 Set up and maintenance of collaborative tools (mailing lists, repositories)

There is a list of internal tools that have been or are going to be set in place for the daily activity of the EOSC DIH and store documentation.

- **Confluence page**: A repository to store the main documentation of the project and the information required to assess the impact of the DIH. It contains a space for Actions monitoring, Pilots, Collaborations, Events and Dissemination actions, Materials, Meetings and Website changes. It also contains the basic information of the project to be shared with other WPs under the EOSC Future project (Main objectives, Subtask leaders, communication channels, contact emails).

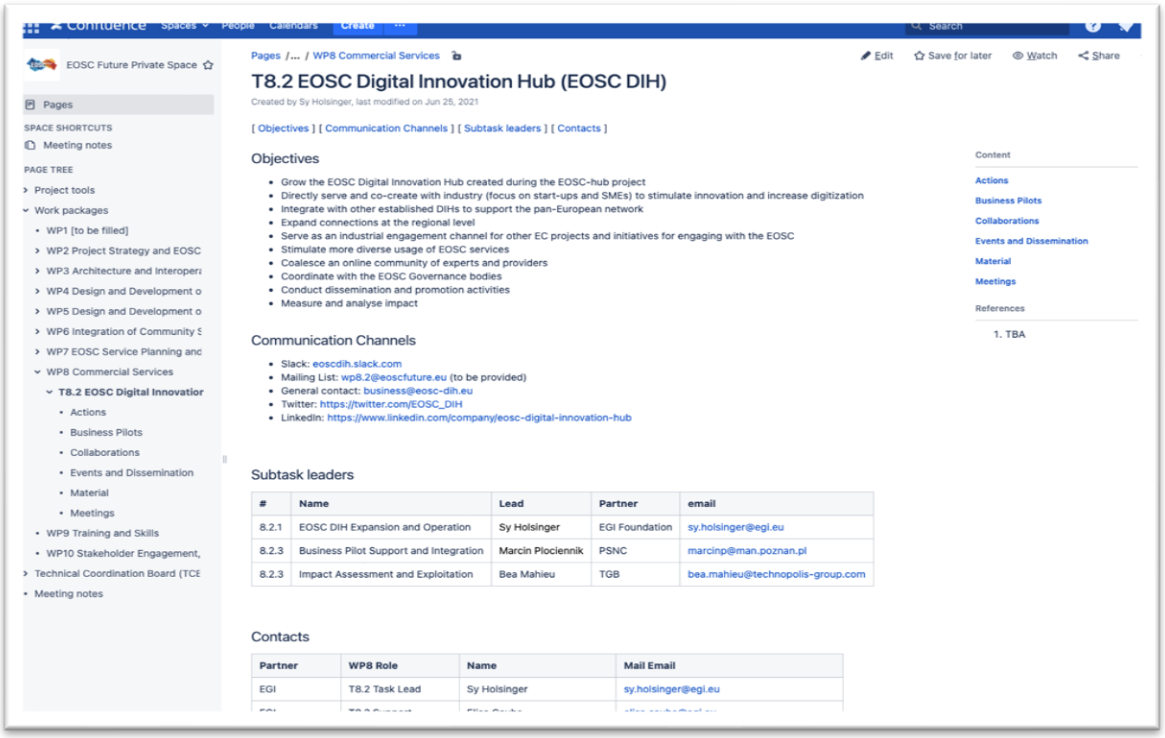

Figure 5-3: Screenshot of the confluence page for the EOSC DIH

- **Google Drive repository**: A Google Drive repository for sharing materials and information to work in a collaborative way. It contains space for storing templates, graphical material, pilots documentation, partnership pagers, meetings minutes, slides for presentations, ongoing deliverables, budget sheets and general documentation of the DIH.
- **MS Teams:** Microsoft Teams is the main project document repository, which task members will also use for internal project sharing purposes.
- **Mailing list**: A mailing list for task specific communications - wp8.2@eoscfuture.eu.
- **Slack channel:** The project leverages the already established EOSC DIH workspace for daily communications. This workspace comprises several channels split by topics that are also accessible by wider community members (partnerships, pilots, etc.). A private channel was created for EOSC Future in order to facilitate daily communications specific to the project and only visible by task members.

5.1.1.6 A1.6 Organise and conduct regular management team meetings

Regular meetings are organised to discuss the ongoing activities and the upcoming tasks in addition to any administrative or financial communication to be shared with the members of the WP8 T8.2. The meetings take place on a bi-weekly basis, and the agenda available in Indico is previously distributed via the Slack channel, also uploading the main materials to discuss or support documentation.

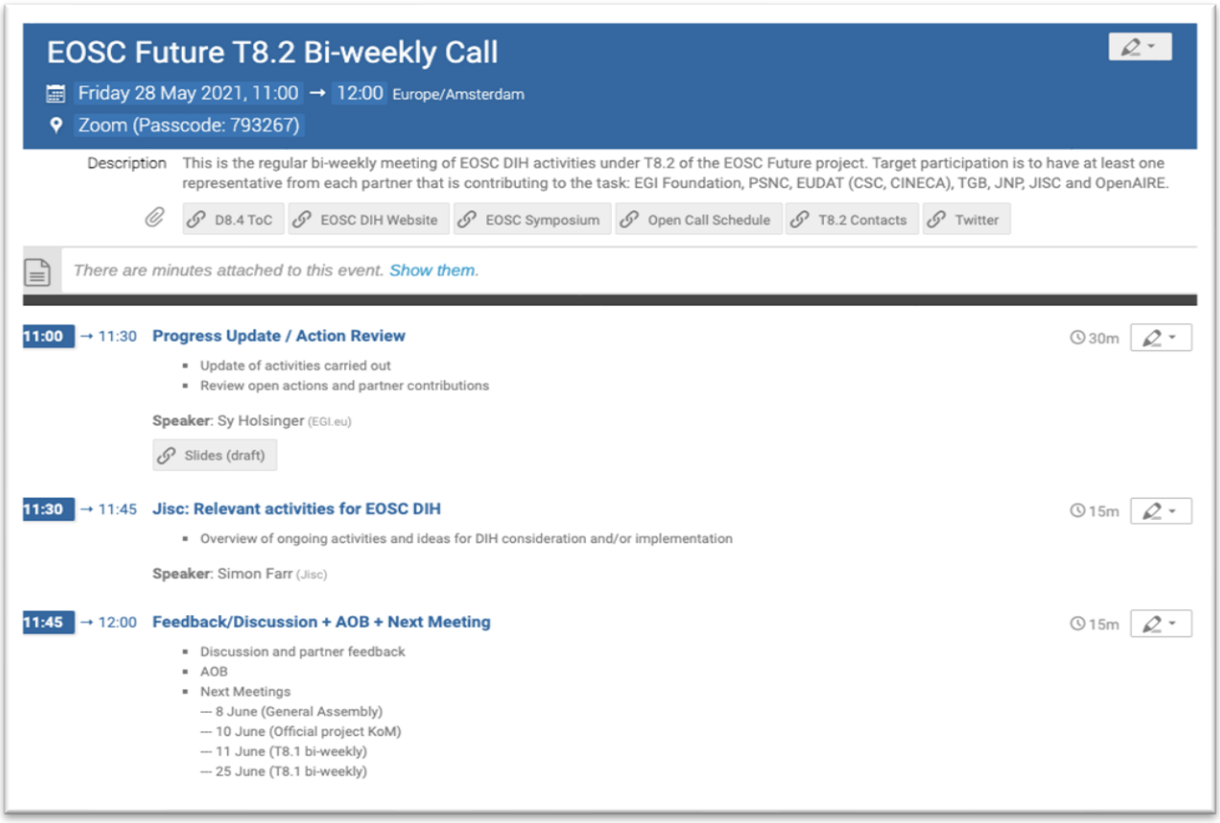

Figure 5-4: Screenshot of a regular bi-weekly call agenda under INDICO

The meetings are conducted by the EOSC DIH coordinator via Zoom as the video conference mechanism. It is anticipated that at least 1 annual physical meeting will be held in the period 2022-2023 when travel restrictions are expected to be removed.

In addition to bi-weekly meetings, specific meetings have been and will be scheduled when further topical specific discussions are required e.g. strategy, onboarding new pilots, purchase external services.

5.1.2 O1.2 Coordinate external communication and community building mechanisms to sustainably engage with Industry stakeholders (customers)

This operational objective intends to provide the EOSC DIH with the tools and mechanisms to create a community and engage with the stakeholders and the industry ecosystems. This implies setting up the appropriate communication channels, defining a clear strategy for the generation and sharing of contents and information, and managing a defined agenda of events and networking activities involving main target audiences with the collaboration and support of WP10.

5.1.2.1 A1.7 Maintain the EOSC DIH website and social media channels and enlarge the user base

A dedicated EOSC DIH website[9] was designed and implemented during the EOSC-hub project. The homepage includes the promotional video of the EOSC DIH.

[9] https://eosc-dih.eu/

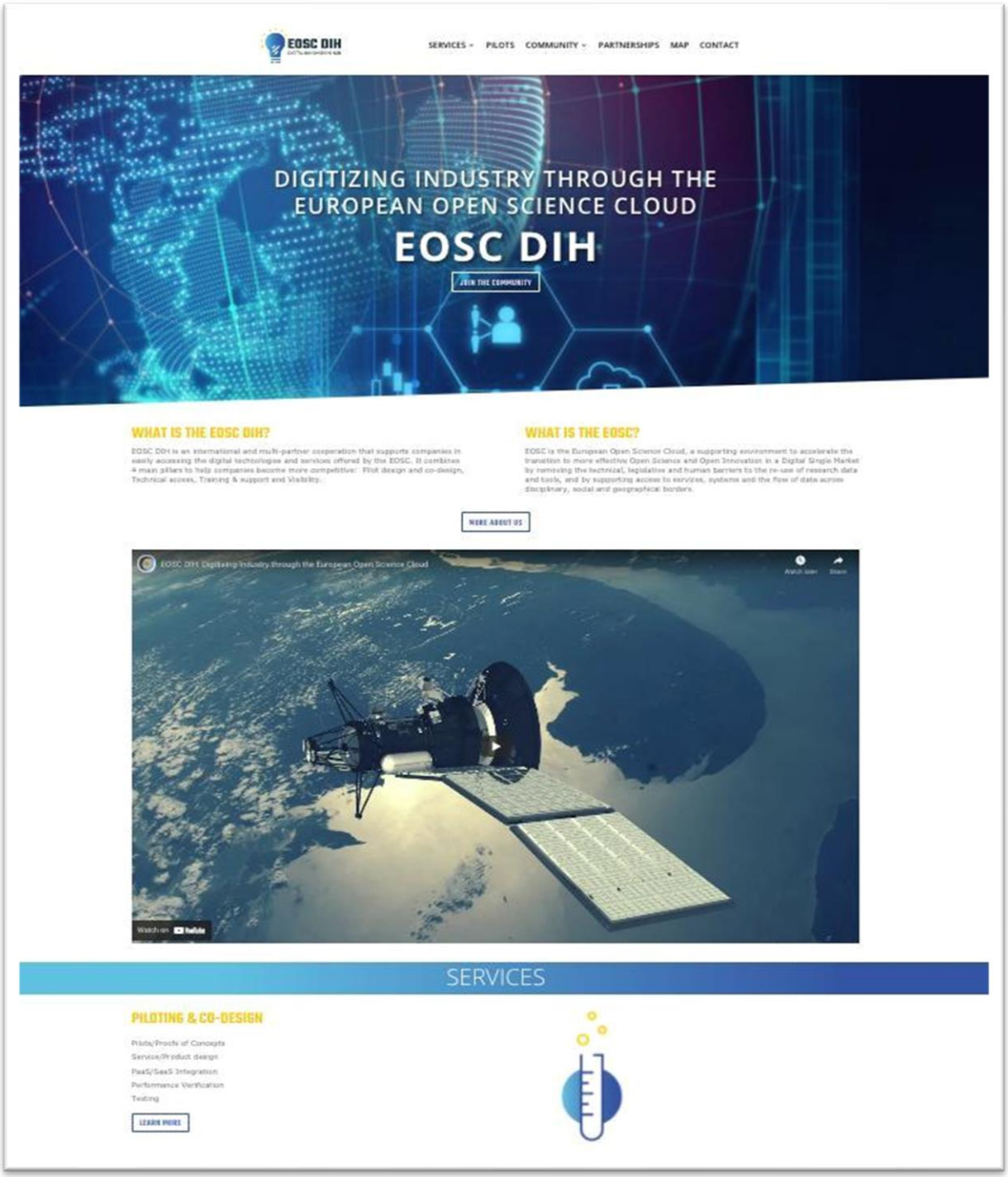

Figure 5-5: EOSC DIH website

The EOSC DIH website is the main channel for dissemination activities and news with the community and the centre point to share the services that the EOSC DIH offers, while the Pilots section provides a description of the experiments running in the DIH.

Under the EOSC Future project, the website will be updated at content level and some improvements to make the homepage more dynamic will be implemented. It is not expected to implement major changes in the website structure that follows the scheme below. Content will be coordinated with WP10 to ensure relevant information is included on the EOSC Future project website.

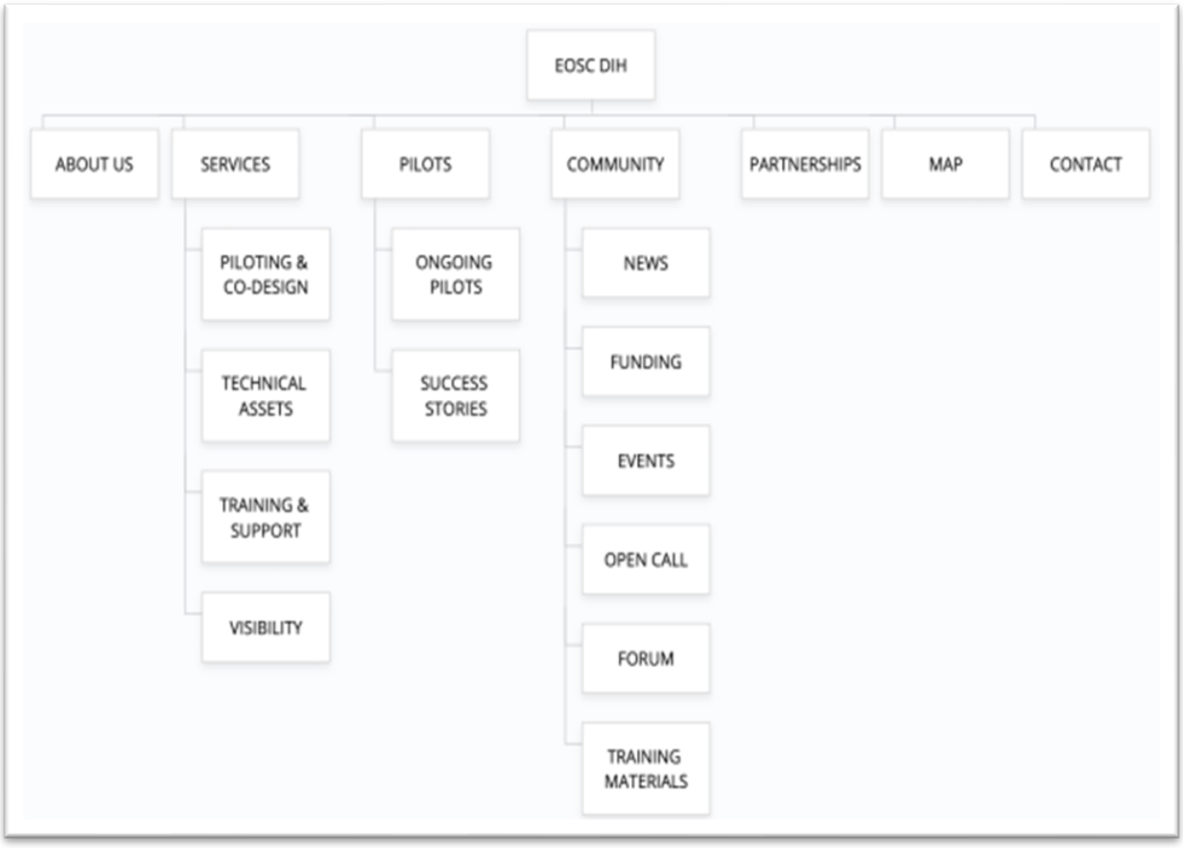

Figure 5-6: Website sitemap

In addition to the website, the social media channels are used to communicate the work about the EOSC DIH, sharing the news and latest updates. The Twitter account @EOSC_DIH[10] currently has more than 600 followers and the LinkedIn profile[11] has almost 100 followers (set up later during the EOSC-hub project), both mainly used to establish engagement with the community and regularly connect with stakeholders and relevant accounts in the context of EOSC and DIHs as well as to communicate the main outcomes and news of the EOSC DIH.

[10] https://twitter.com/EOSC_DIH
[11] https://www.linkedin.com/company/65002258/

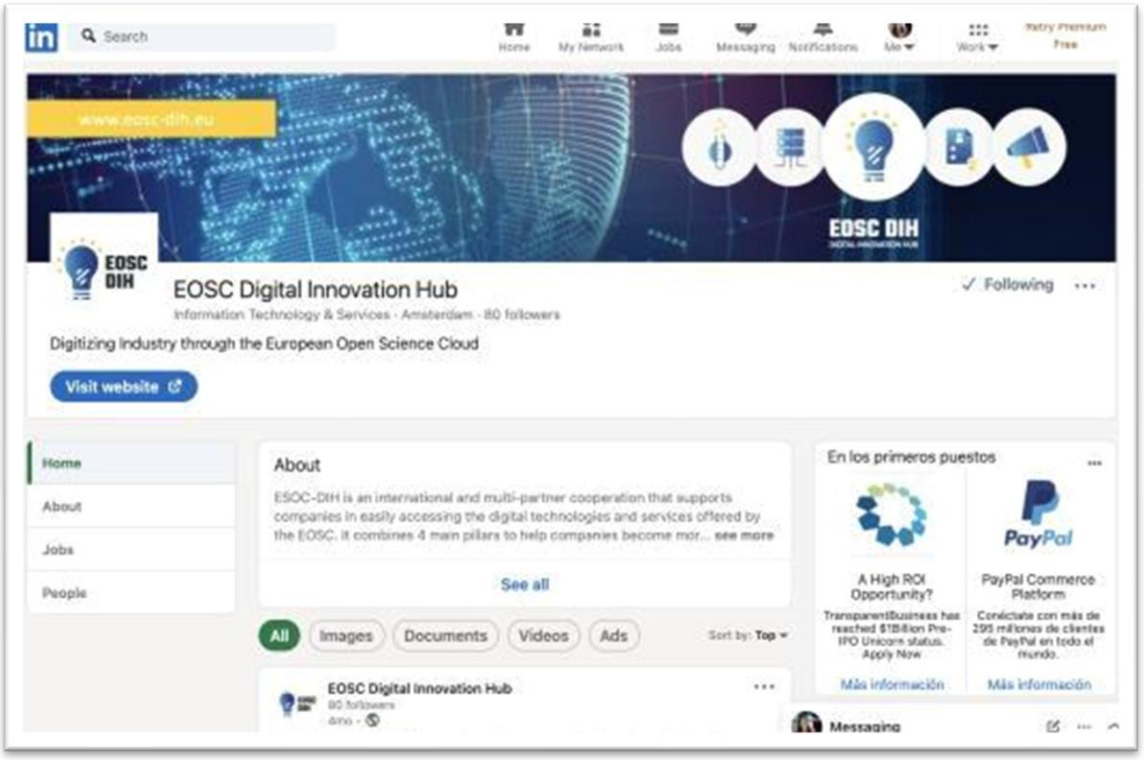

Figure 5-7: EOSC DIH LinkedIn profile

Figure 5-8: EOSC DIH Twitter profile

An EOSC DIH YouTube channel[12] has been created with the promotional video of the EOSC DIH where different videos, webinar, and sessions will be included in the upcoming months.

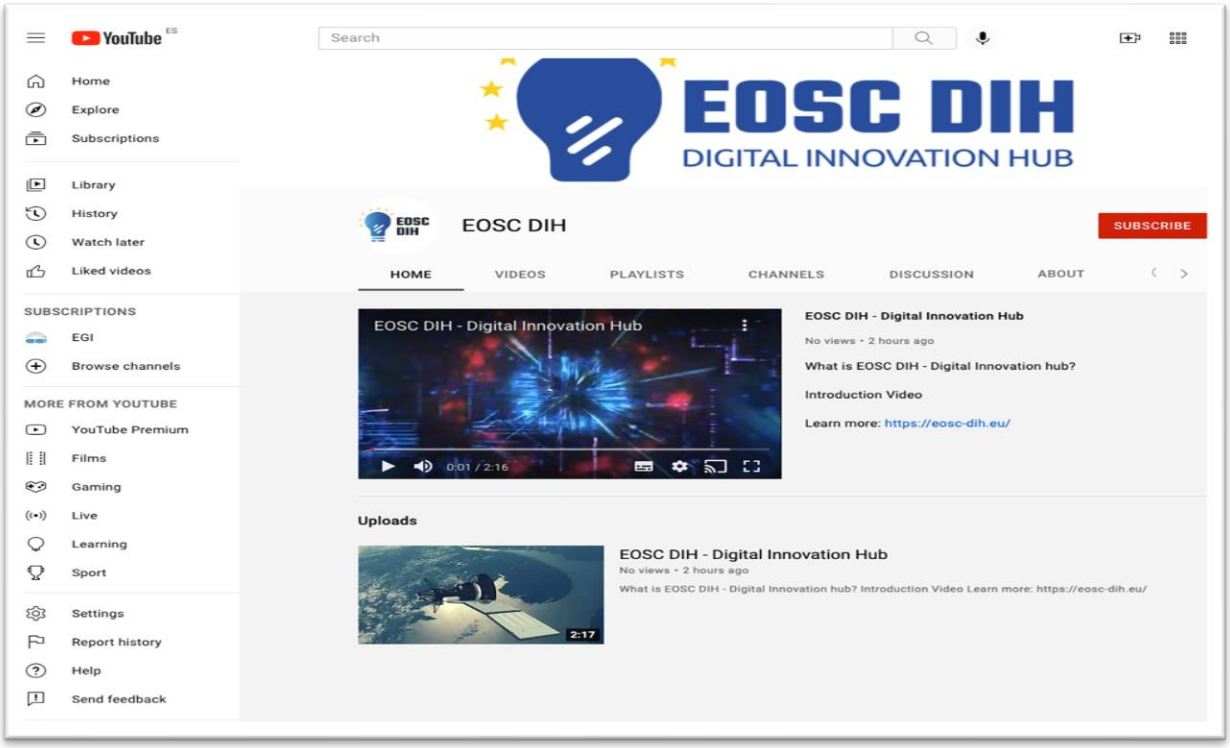

Figure 5-9: EOSC DIH YouTube channel

Communication workflow

All major communication updates related to the EOSC DIH will be shared with WP10, who will help distribute via the official EOSC Future communication channels (TW, LI, website). The dedicated EOSC DIH social media profiles and website will serve as the primary source of any news, while WP10 will act as an amplifier for further sharing. Any graphical design or work will be supported by the designers part of WP10.

In addition to the EOSC DIH website and communication channels, the task will also leverage all four websites of which the project has (partial) editorial control:

- The existing EOSC Portal website[13], which will post information related to the creation of a fully-functioning EOSC Portal, including the training Knowledge Hub, the Policy Observatory, and the User Registry. It will be the main platform for the promotion of the EOSC Core services and developments.
- The EOSC Future project website[14], which will provide updates on the project progress and will host the project deliverables and main outputs [Launch: M6].
- The EOSC Future Funding Platform[15], which will host all information related to the purchasing of services from industry to ensure transparency, oversight, and management (coordinated in WP1 T1.5).
- An EOSC Future wiki[16], which will mainly host user documentation.

[12] https://go.egi.eu/EOSCDIH
[13] https://eosc-portal.eu/
[14] http://eoscfuture.eu/
[15] https://eoscfuture-grants.eu/
[16] https://wiki.eoscfuture.eu/

Finally, according with the lessons learnt, an analysis of the EOSC's USP will be conducted to improve the visibility of the EOSC in commercial channels.

5.1.2.2 A1.8 Create and disseminate communication material to targeted groups

The EOSC DIH is one of the key engagement activities within EOSC Future. Dissemination and communication will therefore happen in close communication and alignment with the general EOSC Future communication strategy, as outlined in D10.1.EOSC Future Stakeholder Engagement & Communication Strategy & Plan. The liaison with WP10 and WP8 T8.2 will be coordinated by the EGI Foundation.

According with the lessons learnt, the communication material and in the general all the dissemination activities will be created avoiding the use of EOSC or project related jargon to become more user friendly to SMEs and highlighting the EOSC's USP.

The following Table 5-2 extends the value proposition for partners and engagement strategies described in Table 4-1 of Target Audiences - Community with this structure for the Communication strategy (Who, Why, What, How, When), including the main messages to communicate, the channels to use, and when to do it.

Table 5-2: Communication strategy

Target audience (who)	Goal (why)	Message (what)	Dissemination Channels (how)	When
Zero level: EOSC DIH partners and internal providers				
- EOSC DIH partners - Internal experts - Internal providers	Keep them committed Keep them motivated Keep them active Keep them informed	DIH as a complementary mechanism to collaborate with other EOSC partners on engagement industry to promote innovation activities	Mailing lists Social media EOSC DIH Slack EOSC Future websites	Full period
First level: Members of the community				
- SMEs running pilots	Keep them active Keep them motivated Keep them informed Keep them part of broader thing Keep them consulted	- Single point to innovate (tech + funding + skills) - Access to advanced computing, data services, open science with tech support - Pan-European visibility	Mailing lists Social media Events/Trainings Dedicated Slack Channel open for externals EOSC Future websites	Pilot campaigns While pilots running
- External experts -Partnerships	Keep them committed Keep them informed	- Matchmaking space to facilitate and simplify collaboration with Industry - Income mechanism to sustain their business	Mailing lists Social media Events/Trainings Dedicated Slack Channel open for externals EOSC Future websites EOSC Portal Newsletter	Full period with focus during the purchase of services
Second level: Potential partners				
Start-ups, spin-offs, and SMEs	Keep them informed Keep them invited Keep them consulted	- Single point to innovate (tech + funding + skills) - Access to advanced computing, data services, open science with support	Mailing lists Social media Events/Trainings Webinars EOSC Future websites EOSC Portal	Pilot campaigns

		- Pan European approach and networking	Newsletter	
Regional DIHs and EDIH	Keep them informed Keep them involved in networking activities	- Complementary pull of services and pilots	Mailing lists Regular meetings Events/Trainings Webinars EOSC Future websites	Second half 2022 and 2023
External experts, Universities and CC	Keep them informed Keep them involved in networking activities	- Matchmaking tool to facilitate and simplify collaboration with industry - Mechanism to engage with EOSC	Mailing lists Social media Events/Trainings Webinars EOSC Future websites	Full period with focus when onboarding new pilots
Third level: Decision makers and networks				
EOSC Governance	Keep them informed Keep them committed	- Mechanism to provide innovation into the EOSC ecosystem	Personal mail	Quarterly
European Commission	Keep them informed Keep them committed	- Mechanism to boost digitization and innovation in Europe to become more productive	Personal mail	Semi-annually
Data Spaces	Keep them involved in networking activities	- Mechanism to collaborate and exploit data	Mailing list	Semi-annually
DIH networks and CTA	Keep them involved in networking activities	- Pan-European DIH to establish collaboration among countries and corridors	Mailing list EOSC Portal Newsletter	Quarterly
Clusters and SMEs associations	Keep them informed Keep them involved in networking activities	- Matchmaking tool - Gateway to collaborate in Europe	Mailing list EOSC Portal Newsletter	Full period with focus during the purchase of services

Dissemination KPIs will be mainly collected by WP8 T8.2, but these numbers should be supplemented with additional numbers collected through the EOSC Future communication channels described in D10.1 (see table below).

Table 5-3: Contribution of EOSC DIH to EOSC Future dissemination KPIs

Project Target	Project Total Value	DIH Contribution	Project Target Description
Number of EOSC Future stakeholder events (physical, virtual and / or hybrid)	>40	>5	Number of multiplier workshops and events, EOSC readiness workshops, EU RDA Plenary Meetings and EOSC symposia
Number of participants attending EOSC Future events (physical, virtual and / or hybrid)	>2,000	>100	Total number of participants in *EOSC Future* stakeholder events
Number of appearances at third party events	60	15	Speaking slot participation at conference
Number of EOSC in Practice Stories published with	>30	5	Focus is on easy-to-read summaries where impact is key for different stakeholders to digest EOSC added value. Member states, Policy, Citizens and

multidisciplinary and cross-country) content			General Public. Used as key documents during EOSC discussions
Number of Webinars	30 (with > 50 participants each)	3	Short webinars to explain what Open Science means in reality and demonstrate specific services' added value, where possible webinars will be backed up by use cases
Number of articles, events and infographics published on the website	500	20	Production of content for the website delivered around specific highlights on deliverables and milestones
Number of views via social media	1,000,000	120,000	Twitter/LinkedIn publications and campaigns. Numbers will increase during live events, workshops, or webinars to promote specific results
Number of video views	20,000	200	Minimum 10 Videos produced, as well as motion design. Assess number of video downloads, viewed news pieces with likes and comments
Number of articles published by third parties	100	20	Online publication on websites, newsletters and news outlets published by the general and specialist media. Expected to a) generate increased stakeholders, b) increase numbers on social media channels, c) look to find best practices exchanges / synergies with other related projects

5.1.2.3 A1.9 Organize and attend events/conferences and industry related fairs

Part of the community engagement relies on the participation of scientific and industry related events where the EOSC DIH finds opportunities to showcase the services, use cases or success stories, and to onboard new ones. There are several types of events that can be split into 4 main categories.

- **EOSC related events**: Events organised by the EOSC communities, with a research focus and involving the main partners and research groups participating in diverse EOSC related projects. The objective when participating in these events is to share the DIH as the main mechanism for innovation, offering EOSC services to industry, and to influence EOSC policy makers to support the EOSC DIH. Examples include:
  - EOSC Symposium'21 (15-18 Jun 2021) 'EOSC DIH: Bridging industry and EOSC - Sy Holsinger'[17]
  - EOSC Future week (to be confirmed)
  - EOSC Symposium 2022 (to be confirmed)
- **DIH related events:** Events organised by the main DIH actors and projects, with the main opportunity of giving visibility to the EOSC DIH at a European level, establishing new links with other DIHs and learning about the latest DIH related news, funding opportunities, and joint activities. Examples include:
  - EDIH events. https://digital-strategy.ec.europa.eu/en/activities/edihs
- **General European Commission related events:** The European Commission organises regular ICT events where there are specific spaces and time slots for DIHs. The objectives for participating in these events are to give visibility of the EOSC DIH by sharing the services and the use cases to attract new companies, to establish new networking links or partnerships with other DIHs or projects related, and to learn about the EC strategy about the DIH. Examples include:
  - European Weeks of Regions and Cities[18]. 14 October 2021.
  - ICT 2022, and ICT 2023 (To be confirmed)
- Industry related events and fairs: Events typically attended at a national level. They offer the opportunity to get in touch with several local companies, SMEs, start-ups, and to uptake new business opportunities. Another goal when attending these events is to obtain visibility at a national or local level, and to engage with national policy makers. Examples of some upcoming events are:

[17] https://www.eoscsecretariat.eu/eosc-symposium-2021-programme
[18] https://i4ms.eu/event/european-weeks-of-regions-and-cities/

- Warsaw Industry Week. International trade fair of innovative industrial solutions. 5th edition. 8-10 November 2021. https://industryweek.pl/en/.
- ITM industry Europe fairs (already in 2021 DIH presentation during the ITM industry Europe Congress/Workshop).

Due to the COVID restriction for travelling, the participation in events during 2021 have been reduced. It is expected to increase the participation in physical events from 2022 onwards.

5.1.2.4 A1.10 Analyse sustainability models and engage with EOSC Governance

From the early lessons from European regions[19], it can be stated that 'DIHs count with a bit of base funding from public sources to provide some elementary services, usually supplemented with additional revenue sources such as delivering more complex services or initiating and managing projects. For the long-term sustainability of a DIH it is essential to keep track and actively identify and use different funding sources. DIH managers need to consider carefully how to build up a proper funding mix for planned activities. However, mixing funding sources up and aiming for synergies at the same time can create complications, not to mention the issues related to state aid and different administrative requirements from different financing sources that need to be overcome'.

The EOSC DIH provides services that are mixes of public and private in nature. A common way to organise the funding of DIHs is the hybrid business models that combine public and private financing sources. Previous analysis in the publication stated before, suggest that for most hubs the base funding comes from public sources to cover offices, test infrastructure, equipment, part of salary costs, and to some extent from membership fees. In some cases, beneficiaries pay to receive certain services while other sources could be used to fund or subsidise development projects.

A preliminary work in the analysis of sustainable models was initiated under the EOSC-hub project. The Terms of Reference document was created partially to agree on the individual commitments of the entities to provide support. A membership mechanism was briefly explored, but the lack of maturity in the DIH sector at European level did not facilitate a real validation.

The EOSC DIH should align its activities with the ESOC Governance Board to identify opportunities for future funding models that may rely on the EOSC in the long term. One of options to explore is the EOSC DIH being considered as part of the EOSC core to be included in procurement activities or other direct funding opportunities. In parallel with this internal discussion, the EOSC DIH will investigate complementary business models and financial mechanisms to further support the long-term operation of the EOSC DIH. An initial draft Table based on the Practical Handbook and Good Practices [20] has been considered for further analysis.

Table 5-4: Analysis of funding sources

Cost Item	Potential Funding Sources
Staff costs, equipment, facilities	National and regional funds, membership fees, usage fees, sponsorship, European Regional Development Plan (ERDP)
Skills and training	National and regional funds, membership fees, usage fees, sponsorship, ERDP
International collaborations	National and regional funds, membership fees, usage fees, sponsorship, ERDP, Interreg Europe
Research and innovation projects	National and regional funds, membership fees, usage fees, sponsorship, ERDP
Financial support of SMEs and or DIHs	National and regional funds, venture capitalists, InvestEU

[19] https://europa.eu/!Jp39Yf
[20] https://publications.jrc.ec.europa.eu/repository/handle/JRC121604

5.1.3 O2.1 Attract new private sector services into EOSC to further grow it with innovative tools and services

This operational objective focuses on the enhancement of EOSC services by onboarding the private sector into the EOSC ecosystem as providers, boosting the open innovation, collaborative actions, and purchasing innovative services to cover the EOSC or EOSC DIH needs.

5.1.3.1 A2.1 Explore industry services of the EOSC DIH community or other industry opportunities to be onboarded or integrated in the EOSC

When running business pilots and participating in partnerships, some of the external services from these companies or projects/initiatives may have interest for the EOSC community. It is also an objective of the EOSC DIH to onboard these external services in the EOSC to enhance the services for the research community fostering open innovation.

The exploration of these potential services will be carried out in three main contexts:

- **When attending events:** Conferences and fairs (both research and industrial) are optimal scenarios for exploring innovative solutions that may help the EOSC research community.
- **When receiving proposals for partnerships:** When a project or initiative is open to collaborate with the EOSC DIH, they may have some type of interest in the exploitation or reuse of their services not only in the EOSC DIH, but in the EOSC community.
- **When launching the campaign for pilots:** When a promotional campaign for business pilots is launched, several requests typically are received in batches, with potential interest in being integrated into the EOSC, for example, by including their service in the EOSC Marketplace.

These scenarios will be covered under this activity and once identified, the best mechanism to be onboarded/integrated in the EOSC the EOSC DIH will act as the main interface with the EOSC community. For example, onboarding new services into the EOSC Marketplace the service providers need to register at EOSC Portal[21] and provide a full description of the service that later will be evaluated. The EOSC DIH will support the external providers in this process.

5.1.3.2 A2.2 Conduct the appropriate purchasing mechanism to onboard innovative services enhancing the EOSC and EOSC DIH

The EOSC DIH expects to enhance the EOSC and the EOSC DIH itself with the concept of Open Innovation [3] in the sense that the EOSC DIH is looking for innovative services outside to be integrated with services or offered to the EOSC. Open Innovation in its approach of 'outside in' requires the research of external innovative services or solutions that may cover the needs or gaps inside the organization, and that are not easily available in the market.

To this end, the EOSC DIH is preparing a purchase of goods and services with a total budget of EUR 600K to incorporate this external knowledge into the EOSC community that will be covered with funds allocated to WP8 T8.2 and coordinated by WP1 T1.5. The Action A2.2 will collaborate closely with T8.1 to re-use existing processes and tools as well as for the collation of requirements from EOSC stakeholders. For example, discussions are on ongoing for integrating a separate section in the required services survey (input to D8.2), which will request the various EOSC stakeholders to clearly articulate services not yet available (requiring development). T8.2 will respond to these requirements by engaging the SMEs regarding innovation opportunities.

The initial schedule for this activity is the following:

Table 5-5: Timeline for the purchase of services mechanism

Activity	Period
Internal consultation for the EOSC needs	Oct-Dec 2021
Internal consultation for the EOSC DIH needs	Oct-Dec 2021

[21] https://providers.eosc-portal.eu/becomeAProvider

Documentation and legal support	Oct 2021 - Jan 2022
Contractual agreements and launch	Jan-Feb 2022
Development/ integration of goods / services	Starting in Mar 2022
Performance Review	After 6 months of delivery

5.1.4 O2.2 Promote the EOSC services with potential exploitation in Industry through the EOSC DIH

Although the EOSC DIH already has several EOSC services to offer industry, it is expected that during the EOSC Future project several new services or components will be developed and may have interest for the private sector. It is also part of the EOSC DIH to explore internally under the EOSC ecosystem the potential outputs with potential interest for industry and therefore, for being included in the EOSC DIH offer.

5.1.4.1 A2.3 Conduct regular meetings and establish clear mechanisms with WP5 to identify and define the exploitation paths of EOSC services through the EOSC DIH.

WP5 is the work package created for Design and Development of the Portal Demand Layer, and thus, in charge of the analysis of the user interaction with the EOSC Marketplace.

There are services that may be potential candidates to be included in the DIH service offer. However, and according to the lessons learnt, it is expected that these services will be analysed to assess its maturity and real added value to the EOSC DIH users. This work will be done in collaboration with WP5.

If the SMEs of the EOSC DIH community use the services offered in the Marketplace, their feedback will be valuable for the quality improvement or new functionalities discovery. This information will also be helpful to define the exploitation paths of EOSC services aligned with the industry needs.

For the communication with WP5, the EOSC DIH expects to organise quarterly meetings to discuss the best use of the EOSC services under the Marketplace and share the feedback from industry users with the front office development team.

In addition, WP5 main representatives will be invited to participate in annual meetings and will be informed about the main updates and news of the pilots running experiments under the EOSC DIH.

5.1.5 O3.1 Increase the EOSC DIH offer with external capacities from regional/ national DIHs and innovative projects.

This operational objective is focused on expanding the capacities and the position of the EOSC DIH in the DIH network by collaborating with other DIHs and research initiatives and complementing the service offer.

5.1.5.1 A3.1 Develop partnerships for integrating external technical offers into the EOSC DIH, and into the EOSC Marketplace when appropriate

In the context of the DIH in Europe, the collaboration between projects, entities, and initiatives is key to providing a complementary offer and help each other in the innovation process. There are already a number of partnerships or collaboration agreements that the EOSC DIH has established[22], with the main interest in the exploration of increasing the DIH offer, joint innovative activities, sharing knowledge and capacities, and the search of use cases or business pilots to implement them.

All established collaboration agreements will be revisited to check current actions and to identify new options of collaborations. For each collaboration, an EOSC DIH lead will be assigned to be in charge of creating, modifying, or removing the agreement and checking the status and the achievements. Currently, the potential agreements in the short-term are the following: North Holland EDIH, DAMAS EDIH, NASU, BDVA / EUH4D.

[22] https://eosc-dih.eu/partnerships/

5.1.6 O3.2 Exploit the EOSC DIH offer

In addition to the partnerships with other DIHs and research projects to onboard services into the EOSC DIH offer, and when possible, in the Marketplace, there is also the interest in exploiting the EOSC DIH offer and other potential exploitable results in a wide spectrum of entities that may help to reach potential customers, or that the service offer, integrated with other services may result on new business opportunities for specific audiences.

5.1.6.1 A3.2 Identify and define strategic synergies with external multipliers as potential users of the EOSC DIH offer and EOSC exploitable results

Within this activity, the EOSC DIH will explore the establishment of strategic synergies with both internal (e.g. the SME community around the OpenAIRE Research Graph) as well as external multiplier outreach channels to SMEs (e.g. European Cluster Collaboration Platform, European Enterprise Network) and other private or public sector SME matching and value-adding platforms and providers through dedicated agreements. The activity is supported by a subcontracting budget. Selected subcontractors will deliver a specific action regarding the consultancy and support to establish partnerships with a number of multiplier networks in different countries and in maturing an industrial partnership framework for long-term sustainability.

As an initial set of concrete actions, the following potential synergies are going to be considered:

- **Internal synergies**: the SME community around the OpenAIRE Research Graph, an open resource that aggregates a collection of research data properties available within the OpenAIRE Open Science infrastructure for funders, organizations, researchers, research communities, and publishers to interlink information by using a semantic graph database approach.
- **External synergies:**
  - **Networks and Federations**: These networks are composed of hundreds of companies committed to innovation where the potential of exploitation may be high i.e. EUH4D, SME Alliance, European Cluster Collaboration Platform, European Enterprise Network, among others.
  - **Technological Clusters**: Associations of companies with similar interests under the same industry sector that may not be aware of the opportunities that DIHs may offer. Although the EOSC DIH is sector agnostic and region agnostic, opportunities of collaboration and how to use the cluster mechanisms to increase the exploitation of the EOSC DIH services will be explored.
  - **Spin-offs programs in Academia**: It may become an excellent opportunity to work with small spin-off companies that were created in the research context and are familiar with research environments and infrastructures but may not have the knowledge/resources to work with the EOSC. Nowadays, almost all the universities provide a spin off programme, even some of them with support for their development (buildings, mentoring, direct funding).

5.1.6.2 A3.3 Participate in European networks and alliances as well as actively contribute to their events and conferences (International, National, and regional level)

The collaboration with European networks in the DIH ecosystem will increase the visibility of the EOSC DIH and will enhance the business opportunities of the EOSC DIH community. This collaboration will be materialised in the organization of joint activities and events, exploration of complementarities in the services, sharing training and funding opportunities, among others.

DIHNET

The DIHnet project (Next Generation European DIH Network[23]) is the network of engaging hubs, competence centres, national and international programmes, and infrastructures to ensure the coordination of these initiatives across Europe. The project aims to guarantee the best possible support to SMEs and midcaps by increasing collaboration between stakeholders from the EU DIH community. The EOSC DIH has actively collaborated with the DIHNET network by participating in several of its activities and conferences, with a special highlight for the Champions Challenge, a prize for those mature DIHs that can inspire and guide other DIHs in

[23] https://dihnet.eu/

their developments. Although the EOSC DIH applied for the challenge, the score was not enough to be awarded, but was a useful internal self-assessment process.

EUHubs4Data

The European Federation of Data Driven Innovation Hubs (EUH4S) aims to consolidate as the European reference for data driven innovation and experimentation, fostering collaboration between data driven initiatives in Europe, federating solutions in a global common catalogue of data services, and sharing data in a cross-border and cross-sector basis. As a reference to the establishment of the Common European Data Spaces, the federation is initially composed of 12 DIHs, covering 10 countries and 12 different regions, and plans to increase the geographical coverage by incorporating other relevant initiatives.

EDIHs

In recent years, the European Commission (EC) has been working on the definition of the European Digital Innovation Hubs (EDIHs) for the Digital Europe Programme. EDIHs are specific labels provided by the EC to regional DIHs that would benefit from European funding to implement their development at regional level and create the Network of European Digital Innovation Hubs to cooperate with other DIHs in Europe. The call for EDIHs will be open in the third quarter of 2021. The pre-selection of DIHs done by member states has taken place in the last months by the national governments and the preliminary list of candidates are already listed in the S3platform[24].

As the EOSC DIH is a pan-European DIH, and the EDIH framework focusing mainly on regional/nationally selected DIHs, the EOSC DIH will take a two-pronged strategy by first targeting EOSC related industrial activities using the DIH as a concept to formalise pilots and partnerships; and build a network to provide support to other EDIHs. Partners will continue to monitor the EDIH framework for identifying opportunities, and we expect to collaborate initially at least with the following National and regional networks:

- HPC4Poland (Poland)[25]
- Aragon DIH (Spain)[26]
- Basque Digital Innovation Hub (Spain)[27]
- EDIH Publiek (Netherlands)
- Damas DIH (Italy)[28]

5.2 Activity 8.2.2 Business Pilot Support and Co-Creation

This Activity implements three (3) specific objectives that captures the full life cycle of the DIH technical and support aspects in collaborating with commercial partners: from onboarding to exploitation. The idea behind these actions is to work directly with industry partners, support integration within the EOSC DIH community, establish procedures for managing them, provide regular operational support, optimize the impact, and explore further business opportunities.

The specific objectives can be summarized as follows:

- **O4. SME integration in the EOSC DIH community**: Establish mechanisms to involve companies, start common activities, e.g. in the form of a pilot, agree on the requirements and success metrics and identify providers.
- **O5. Successful adoption of innovative EOSC services by industry pilots**: Conduct common activities and define and support the whole process e.g. ensuring the provision of EOSC services, consultancy at any stage of development, monitor the process.

[24] https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool?p_p_id=digitalinnovationhub_WAR_digitalinnovationhubportlet&p_p_lifecycle=0&p_p_col_id=column-1&p_p_col_count=1&_digitalinnovationhub_WAR_digitalinnovationhubportlet_edihTabParam=Candidate+European+DIHs
[25] https://www.hpc4poland.pl/en/
[26] https://www.aragondih.com/en/home/
[27] https://basqueindustry.spri.eus/es/
[28] https://www.leonardocompany.com/en/home

- **O6. Contribute to generate added value to the digital market**: Increase the impact of the activities, define further pre-commercial steps, help with defining the marketing strategy, explore further business opportunities, and disseminate the results.

For these specific objectives, a set of operational objectives and a set of actions have been defined and described below:

Table 5-6: Specific objectives, Operational objectives, and Actions under Activity 8.2.2

Specific Objectives	Operational Objectives	Actions
O4. SME integration in the EOSC DIH community	O4.1 Involve companies in the EOSC DIH	A4.1 Run campaigns for business pilots. A4.2 Evaluate candidates according to the EOSC DIH strategy and the service offer.
	O4.2 Mature mechanism to ensure support for pilots	A4.3 Analyse technical requirements and fulfil the specific agreements to cover them (SLA/OLA).
O5. Successful adoption of innovative EOSC services by industry pilots	O5.1 Support Business pilots	A5.1 Develop detailed work plans including objectives, milestones, KPIs, IPR and exploitation plans. A5.2 Provision and enable access to the requested EOSC services. A5.3 Provide first-level support and monitoring progress. A5.4 Support the SMEs with the process of onboarding of services into EOSC Portal.
O6. Contribute to generate added value to the digital market	O6.1 Increase the impact of the pilots	A6.1 Define pre-commercial agreements for continued business relationships. A6.2 Help SMEs to identify market/business opportunities and assess opportunities for further innovation (i.e. direct support, project innovation management activities).

5.2.1 O4.1 Involve companies in the EOSC DIH

This objective aims to onboard companies in the EOSC DIH by two main mechanisms: official campaigns and parallel engagement activities. This section describes the activities that will cover the campaigns to request companies' collaboration and the evaluation process that pilots will be required to pass to be part of the business use cases of the EOSC DIH.

5.2.1.1 A4.1 Run campaigns for business pilots

Campaigns for onboarding new business pilots will be one of the main mechanisms to engage the SMEs and provide them support. The campaigns will be open to start-ups, SMEs, large enterprises, and innovators to submit a proposal for a pilot and receive services and support on a mutual value exchange basis (no direct funds). The agreed pilots would be required to run their experiments between three to nine (3 to 9) months, making use of selected services or resources provided through the EOSC DIH. In the process of defining and running the campaign, the experience from the previous ones will be used. It is expected to have regular communication campaigns over the course of the project.

The preparation of the campaign will begin with the definition of the goal and scope of the campaign, mainly aiming at stimulating innovation activities within private companies and taking advantage of different services offered by the DIH and EOSC. Lessons learnt suggest the specialisation of DIHs in order to be competitive and customer focused, therefore dedicated campaigns for thematic areas will be explored as well as subgroups to work with companies.

In addition, it is planned to organise campaign information webinars to provide interested participants with an overview of the EOSC DIH and respective services, information about the campaign, including scope, eligibility, and requirements, an overview of some of the ongoing EOSC DIH pilots, and a Q&A session. In collaboration with the Activity 8.2.1, communication campaigns will be performed to reach the potential applicants.

Official campaigns for onboarding new business pilots will not be the only way to engage and support the companies. There is opportunity to contact EOSC DIH directly (e.g. via website, contact lists) and propose and investigate collaboration opportunities that can result in common pilots. Certainly, as part of communication

strategy, this process will be initiated from the EOSC DIH side in many cases, utilising the regional, national, or pan-European contacts (as part of proactive ecosystem and community building activity).

5.2.1.2 A4.2 Evaluate candidates according to the EOSC DIH strategy and the service offer

For each of such possible engagements (official campaigns or contacts for onboarding), there is a need to evaluate the candidates for the pilots, according to the EOSC DIH general strategy and in line with the service offers, feasibility, and capacity of performing the common activities.

In terms of the direct communication with the companies, EOSC DIH representatives will provide interested parties with an overview of the EOSC DIH and respective services and evaluate the proposition coming from the SMEs and their requirements. In case needed, help to evolve the ideas to fit with the EOSC/EOSC DIH interests and priorities is provided, and at the same time, try to optimise potential added value for the SMEs.

The process for onboarding new pilots is documented as an EOSC DIH procedure. The procedure worked during the EOSC-hub project and was documented in the EOSC-hub D9.4 deliverable, which has been considered as a starting point and is available in the Appendix A: Onboarding new pilots' procedure.

5.2.2 O4.2 Mature mechanisms to ensure support for pilots

Once the pilots are onboarded into the EOSC DIH, there is the need to formalize the onboarding and guarantee fulfilment of requirements and the service provisioning with its conditions under an agreement. This will be covered by the following activity.

5.2.2.1 A4.3 Analyse technical requirements and fulfil the specific agreements to cover them (SLA/OLA)

New pilots or business contacts are onboarded and managed via dedicated processes that follow the lightweight service management standard, FitSM[29]. For example, service levels with business pilots are ensured and monitored by establishing meaningful Service Level Agreements (SLAs) and where necessary, supportive Operational Level Agreements (OLAs).

The ideas will be formulated within the SLA template provided by EOSC DIH and followed up by the definition of corresponding activities/tasks, resources, and responsibilities of the parties. The SLA template constitutes the formal document to be signed between the pilot and the EOSC DIH, detailing the services to be provided by the DIH, its partners, and respective rights and responsibilities between the parties.

The process of filling in SLAs will be preceded with the technical analysis of the requirements, that will be done in consultancy with the service/resource providers and other project work packages (i.e. WP6), and technical support team of EOSC DIH. This process is required to check the feasibility of conducting the potential pilot.

5.2.3 O5.1 Support Business pilots

Supporting business companies in its process of testing or experimentation is not only an operational objective, but the main mission of the DIH. The support to business pilots will require direct contact and collaboration with the DIH support members. The activities cover the planning, execution, and monitoring of the pilot as well as the support for onboarding into the EOSC Marketplace, if needed.

5.2.3.1 A5.1 Develop detailed work plans including objectives, milestones, KPIs, IPR and exploitation plans

Already in the proposition phase of the pilots, as well as in the preparation of the SLAs, definition of general tasks and activities including objectives, milestones, and KPIs will be defined. At the beginning of the pilot, those will be turned into a more fine-grained work plan while milestones and KPIs will be revised. If not defined already in the SLA agreement, IPR will be defined in collaboration with the company. During the course of the pilot, depending on its maturity, a new/updated exploitation plan will be elaborated, and the process will be supported by the EOSC DIH.

[29] www.fitsm.eu

Each of the EOSC DIH pilots will have a dedicated mentor and technical support contacts, as well as provider contacts. Each of the pilots will be documented on the EOSC DIH website, and in the EOSC DIH working webspace, together with all the KPIs and milestones, etc.

At the end of each pilot, the EOSC DIH will coordinate the final report and/or creation of the success stories publication that will be shared in the communication and dissemination channels.

5.2.3.2 A5.2 Provision and enable access to the requested EOSC services

The EOSC DIH support team will provide/enable access to requested EOSC services in collaboration with the service providers. According with the lessons learnt, only those services mature enough to cover the SMEs requirements and expectations will be considered.

Depending on the type of the service, different procedures may apply. In general, the activities are related to:

- Finding the provider that can fulfil the pilot requirements
  - Preparing a 'Request for Service Offers' to be sent to the relevant service provider contacts.
  - Review service offers and select the best candidate using the following criteria:
    - Services and technical components matching the requirements.
    - Availability and reliability.
    - How many other pilots have the providers already supported (spread opportunities).
    - If applicable, costs.
- Negotiate the conditions of providing the resources, starting/ending dates
  - If needed, organise meeting with the provider and SMEs.
- Agree with service providers to check the agreement clauses regarding joint IPR (not required for pilots only accessing computing service).
- Prepare and finalize agreements between the EOSC DIH and the pilot partner in the form of an SLA
  - If the service levels of the service provider are not part of the SLA, then an OLA between EOSC DIH and the Service Provider should be defined.
- Confirm access to the service by the pilot.
- Insert details in the 'Use Case Requirements and Offer Collection' into EOSC DIH documentation.

5.2.3.3 A5.3 Provide first-level support and monitoring progress

During the EOSC-hub project, the EOSC DIH established procedures for operational support of the pilots. The EOSC DIH will support the process of designing in detail the new solutions, making technological choices related to EOSC technologies and services, and helping define the detailed architecture, validation, and benchmarking of the solution.

The EOSC DIH will provide the first-level support of any requests coming from the running pilots, in particular, related to technological and communication issues. This can result in checking the technical issues or contacting provider(s).

In addition, this activity will monitor the progress of the pilots, the KPIs, and risks for each one of the pilots.

In order to establish a regular communication and to monitor the pilot progress, several mechanisms are foreseen:

- 3 weekly Community meetings: These meetings are an opportunity to check the status with the pilots as well as create community by sharing knowledge and a networking space.
- Direct communication with the pilots via emails and the private Slack channel set up for each pilot.
- Trello board tracking of all the small subtasks and progress.
- Space in confluence with all the pilot documentation.

5.2.3.4 A5.4 Support the SMEs with the process of onboarding of services into the EOSC Portal.

EOSC DIH pilots can result in a service that can be integrated within the EOSC marketplace. As this process is not trivial for SMEs, the EOSC DIH will support them in the form of consultancy, filling in the required forms and documentation, explaining some of the onboarding requirements, and performing an initial evaluation of the

feasibility of addition of the service into the EOSC Marketplace. The EOSC DIH will also support the communication process if it would appear from the EOSC onboarding team.

5.2.4 O6.1 Increase the impact of the pilots

In addition to supporting the execution of pilots, the EOSC DIH expects to help companies to grow, increasing their impact in both the market and into the EOSC. This operational objective requires some commitment for a mid/long-term relationship to guarantee its sustainability.

5.2.4.1 A6.1 Define pre-commercial agreements for continued business relationships

As a follow-up of some of the pilots, there is a possibility for future pre-commercial activities. EOSC DIH will manage the development of Pre-commercial Agreements, which will be outlined as Service Level Agreements (SLA) for continued support beyond the original pilot objective. These agreements between the EOSC DIH and representatives of selected pilots will provide a further framework for collaboration. Each agreement will be structured into several sections such as the defined work plan, activities, communications, rights and responsibilities, and funding, among others.

5.2.4.2 A6.2 Help SMEs to identify market/business opportunities and assess opportunities for further innovation

As part of supporting the innovation process, the EOSC DIH will continue to work closely with the private companies with the intention of iterating over new ideas and helping in the co-creation process. This will be achieved through workshops, open innovation events, or during the direct interaction with individual entities. The EOSC DIH is planning to involve experts that will help create the customer journeys.

Brokerage and presenting funding opportunities are among the core EOSC DIH services. This can be seen as one of the incentives that supports the engagement of SMEs in the community after the pilot's lifetime and can support further co-creation processes. A dedicated person will be in charge of regularly assessing and searching external opportunities for further co-creation and new external funding opportunities (e.g. open calls of other projects). The focus will be put on the technological interest and expertise of the companies involved in the EOSC DIH community.

The sharing of other funding opportunities not directly associated to the EOSC DIH has already been expressed by the community as an area of interest, therefore, a dedicated section was added to the EOSC DIH website as other campaigns and funding opportunities became available. During the EOSC DIH community meetings, such opportunities are being presented and discussed in detail.

As part of the brokerage, new opportunities of the proposals/projects are planned to be offered as well to the community and interested entities, depending on their expertise.

Furthermore, for the provision of business and market consultancy support services, especially addressing the exploitation prospects of the business pilots selected by the EOSC DIH, adopting a widely accredited and well-established framework such as the 'Real-Win-Worth' (R-W-W)[4] will be considered.

Finally, it is expected to organise workshops and webinars according to the needs of the onboarded pilots. The experience from the EOSC-hub project suggests the organization of similar workshops. Topics previously covered include:

- **Business internationalization**: best practices, and what to look out for when internationalising their projects, reasons for moving into international markets, decisions on the how, when, and where, challenges for internationalisation and useful tools.
- **Marketing strategy**: providing an overview of the marketing and communication landscape, tools for building a campaign for an event or other project initiative and offering participants with relevant resources and materials.
- **Growth Marketing and communication**: understanding the mindset of experimentation, exploring the processes of an experiment and data-driven organisation, and discovering the tools that will help create a consumer-centric journey for their organisation.

- **Technology Transfer models and IPR**: Overview and setup of technology transfer offices, and the roles, methodologies and tools for technology transfer and innovation management, good practices and options for exploitation and licensing.

5.3 Activity 8.2.3 EOSC DIH Monitoring and Evaluation System

This Activity directly responds to EOSC DIH Specific Objective 07: Establish a quality framework to ensure continuous improvement of EOSC DIH. Its key (operational) objectives are to design and implement a monitoring and evaluation (M&E) system that will ensure a regular assessment and ongoing improvement of the EOSC DIH operations and the private entities engaging within it.

Table 5-7 lists the operational objectives and the related actions that will be undertaken under this Activity. These actions will facilitate a systematic capturing of the information and data required for ensuring an ongoing appropriate strategic focus of the EOSC DIH operations, taking into account the developments in the EOSC, EDIH landscape, and communities. They will be implemented in close collaboration with the other Activities in WP8 Task8.2, creating ongoing feedback loops between the actions of the three main Activities.

Table 5-7: Specific objectives, Operational objectives, and Actions under Activity 8.2.3

Specific Objectives	Operational Objectives	Actions
O7. Establish a quality framework to ensure continuous improvement of EOSC DIH	O7.1 Design the EOSC DIH monitoring and evaluation (M&E) system.	A7.1 Refine the EOSC DIH objectives tree and intervention logic. A7.2 Define the indicators framework and KPIs.
	O7.2 Implement the EOSC DIH M&E system.	A7.3 Ongoing monitoring of the EOSC DIH operations. A7.4 Conduct the EOSC DIH final evaluation.

Under the EOSC-hub project, there was no monitoring or evaluation system developed and implemented for the EOSC DIH activities as a whole. Evaluation activities were exclusively focused on the appraisal of the pilots. At the end of the project, an internal evaluation was run (3.2 above on the 'lessons learnt'). KPIs were formulated only in the form of process indicators, merely reporting on the activities implemented.

One of the key lessons learnt was the need for a Monitoring and Evaluation (M&E) System that would ensure an ongoing alignment of all EOSC DIH activities with its objectives and create the opportunity for corrective measures. A first action is therefore to design such a 'comprehensive' M&E system for the EOSC DIH, which would then allow for an ongoing monitoring and a structured final evaluation.

In the sections below, the conceptual framework underlying the EOSC DIH M&E system is set out, the actions related to the Operational objective 7.1 'Design of the EOSC DIH monitoring and evaluation (M&E) system', and those related to the Operational objective 7.2 'Implement of the M&E system'.

5.3.1 Conceptual framework for the monitoring and evaluation system

The concept of a 'monitoring and evaluation' system refers to all indicators, tools, and processes used to measure if a policy initiative (in this case the EOSC DIH) has been implemented according to plan and is having the desired results. An M&E system assesses and provides feedback and input for corrective measures not only related to the efficiency and effectiveness of the implementation, but also and most importantly, on the adequacy of its strategy and activities.

Monitoring and Evaluation are different yet complementary. Monitoring is the process of continuous and routinely gathering and regular reporting of information with which to make informed management decisions for 'corrective measures' to the implementation of the initiative. It is descriptive and should identify actual or potential successes and problems as early as possible. Evaluation is more analytical and seeks to address issues of causality, i.e. the cause and effect of situations and trends which are recorded within monitoring. It assesses the relevance and achievement of objectives, implementation performance in terms of effectiveness and efficiency, and the nature, distribution, and sustainability of impacts.

The EOSC DIH evaluation will take a theory-based approach, in line with the EC approach to evaluation (as defined in the Better Regulation Guidelines). Theory-based models provide an explicit link with the design of an initiative by using the intervention logic as a hypothesis about possible effects. It defines the logical chain between a set of needs, problems or issues, the corresponding change objectives, a set of resources (not only financial) applied to the activities which lead to a set of outputs that will lead to the desired effects in terms of the relatively short-term (outcomes), in the mid-term (results), or long term (impacts). A simplified model of this logic is shown in Figure 5-10.

Evaluation then looks at a number of key issues or questions along that chain. Specifically, it looks at:

- **Relevance**: the appropriateness of the objectives in relation to the problems, needs or issues the initiative was intended to address.
- **Effectiveness**: the extent to which the desired effects have been attained, including the enabling factors and barriers.
- **Efficiency**: the relationship between the resources and the effects. It poses the question whether the effects obtained are commensurate with the inputs (resources) and identifies the causes of any in-efficiencies.
- **Coherence**: the complementarities and synergies of the initiative versus other related initiatives.
- **Added value:** the additionality of the initiative versus other related initiatives, its specific and unique value proposition.

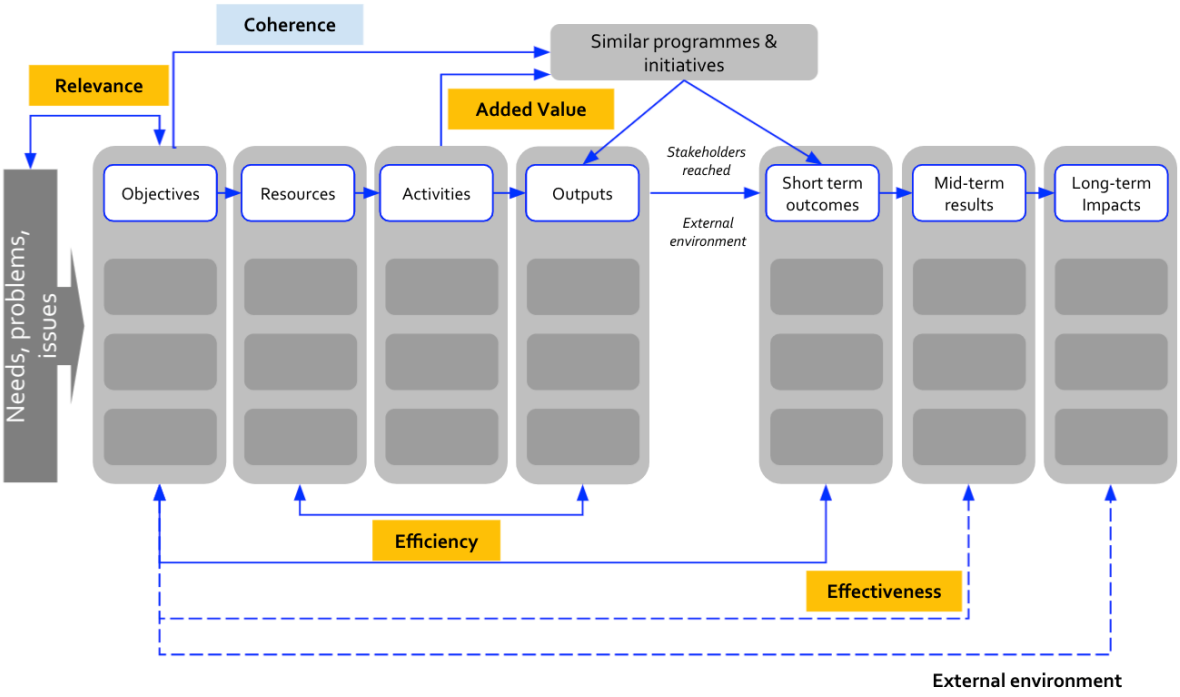

Figure 5-10: Input-Output-Outcome-Impact model and evaluation criteria

5.3.2 O7.1 Design of the EOSC DIH M&E system

The first actions to be implemented in this task aim at the collection and analysis of the information needed for an appropriate planning of the EOSC DIH M&E system.

These actions reflect the standard process for the design and planning of an M&E system as shown in figure below. At the core is the 'logic model' for the EOSC DIH. A first step consists in a review of its strategy and design (Do the objectives respond to the problems and needs? Is there an added value for the targeted stakeholders compared to similar activities, e.g. those provided in other DIHs). The next steps consist in the definition of the assessment criteria, typically based upon a refining of the 'intervention logic' (if needed), and the subsequent definition of performance indicators and metrics for the monitoring and evaluation exercises.

The first two steps in the M&E System design process are grouped into Action 7.1 'Refining the EOSC DIH objectives tree and intervention logic', while the last two steps constitute the focus of Action 7.2 'Defining the indicator framework and KPIs', further described below.

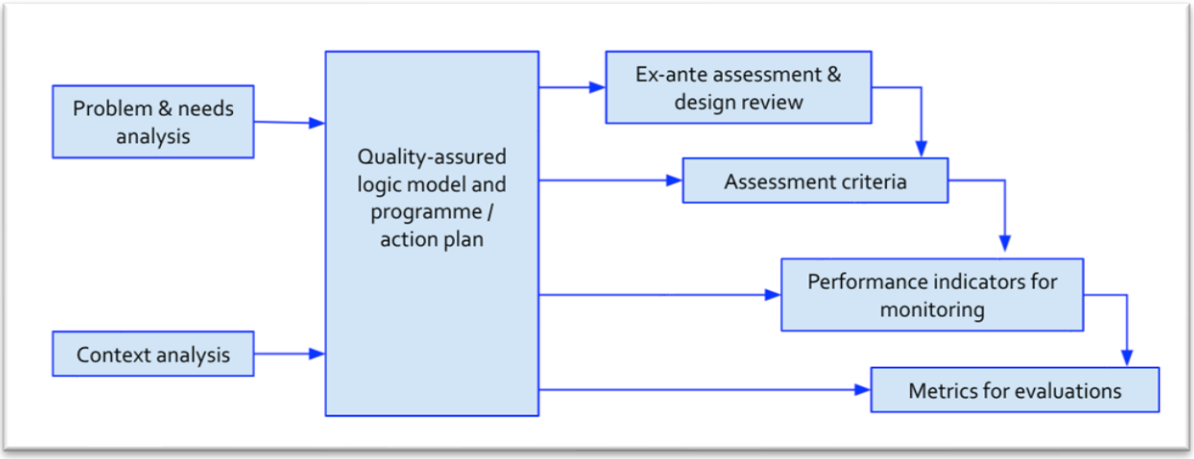

Figure 5-11:Process in the design of a policy intervention M&E system

5.3.2.1 A7.1 Refine the EOSC DIH objectives tree and intervention logic

The 'design review' consists in a re-assessment of the EOSC DIH 'rationale', i.e. the problems and needs it intends to address and its positioning in the 'context' of both EOSC and DIH landscapes. This will allow us to assess the extent to which the current EOSC DIH objectives tree (including the operational objectives) responds to the needs of the targeted beneficiary communities as well as the EOSC-related policies and strategies, thus setting the basis for the EOSC DIH 'relevance'. The context analysis will focus on assessing the extent to which the EOSC DIH strategy and activities complement the other EOSC-related initiatives ('coherence') and the adequacy of its value proposition ('added value').

The outcome of this action will be a refined objectives tree and the definition of the EOSC DIH intervention logic that will set the basis for the M&E system and ultimately, the framework allowing for a robust and results-based scoping and focus of the EOSC DIH activities. This action will be concluded by Month 9 (M9) of EOSC Future implementation timeline (December 2021).

As mentioned before, in the context of the EOSC Future project, the EOSC DIH has the function of acting as a primary EOSC Future industry engagement channel, focusing on innovative SMEs. While the envisaged business pilots will primarily benefit the SMEs involved, the planned procurement activities will also be to the benefit of the EOSC research community, hence establishing a win-win situation in EOSC engaging with the European industry.

The needs of these two major EOSC DIH stakeholder communities will be assessed in a first instance by building upon the experience and lessons learnt from prior related actions: on the one hand, the business pilots conducted by the EOSC DIH during the period it was supported under the EOSC-hub project, and, on the other hand, the OCRE project, which is at the basis of the WP8 T8.1 procurement activities. Desk research will focus on a meta-analysis of the relevant reports and findings of these two projects and include policy documents such as the (2021) Strategic Research and Innovation Agenda (SRIA) of the European Open Science Cloud, the (2018) Final report and recommendations of the Commission 2nd High Level Expert Group on the European Open Science Cloud (EOSC), and the (2020) Proposal for the co-programmed European Open Science Cloud (EOSC) Partnership.

In the context analysis, a broader perspective will be taken to consider the positioning of the EOSC DIH within the broader EOSC and DIH landscape. This will include policy documents and reports related to the EOSC mentioned above as well as those focusing on the digitalisation of industry such as the (2017) reports of the Digitising European Industry (DEI) initiative working groups (WG1 - Digital Innovation Hubs: Mainstreaming

Digital Innovation Across All Sectors, and WG2 - Digital Industrial Platforms). Specific attention will be dedicated to the EDIH initiative in the Digital Europe Programme (DEP) and the developments related to the co-programmed European Open Science Cloud (EOSC) Partnership.

The desk research activities set out above will be complemented with interviews to actors in the EOSC research community, representatives of innovative SMEs, and officials and/or experts involved in the design of EOSC- and DIH-related policies. Interviewees will be identified in close collaboration with the other activities in WP8 T8.2 as well as WP8 T8.1 and WP2.

Based on the information collected through these analyses, the current EOSC DIH objectives tree, shown in Figure 5-12, below, will be reviewed and refined. This will set the basis for the definition of the EOSC DIH intervention logic, i.e. the logical chain of desired outputs and short-term outcomes to the benefit of the participants in the EOSC DIH activities, leading to results or mid-term impacts on the broader EOSC communities, and setting the basis for longer-term impacts in the scientific, economic, and societal sphere.

Figure 5-12 also shows this action in the context of the 'logical framework analysis' process, illustrating the links between the chain of effects and on the one hand, the objectives tree, and on the other hand, the indicators that will allow for its monitoring and evaluation.

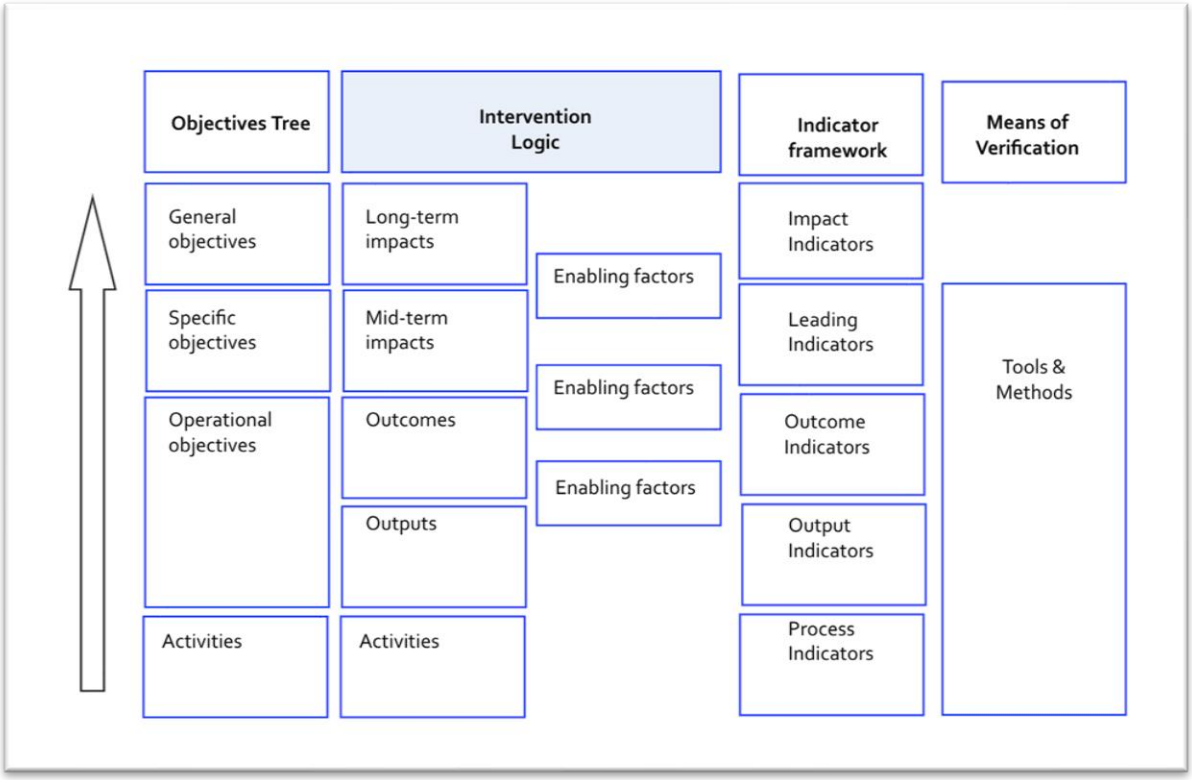

Figure 5-12:Process and scope of the logical framework analysis

Outcomes and results envisaged are, for example, the creation of an improved understanding of industry needs in the EOSC research community, an enhanced capacity for research-industry collaboration in R&I, an enhanced R&I capability among the industry actors, the launch on the market of new or improved EOSC-based products and services.

Taking an impact pathways approach, attention will be dedicated not only to identifying the desired effects of the EOSC DIH activities but will focus also on establishing the factors that will enable the attainment of these effects. These include, e.g. the capacity to engage the targeted stakeholders, the alignment with needs and requirements of the targeted communities, the alignment with developments in the broader landscape, etc.

5.3.2.2 A7.2 Define the indicator framework and KPIs

The next step in the process of a results-based M&E system design is the identification of the indicators that will allow for the assessment of the progress made in the EOSC DIH towards attaining its objectives as well as the collection of the data needed for its evaluation. As shown in Figure 5-12 above, these derive directly from the defined intervention logic. The following types of indicators are distinguished:

- **Process indicators** collected to explain whether the EOSC DIH is implementing its activities as planned and their contribution to setting the basis for the desired outputs and outcomes. The focus is on the adequacy of the scope and quality of the implementation and the 'input' needed, i.e. the financial and human resources invested.
- **Output indicators** monitor the production of the expected outputs of the activities implemented, to the benefit of the research and industry stakeholders involved.
- **Outcome indicators** collect information on the (intangible) effects in the short- to mid-term on the participating organisations as a result of the EOSC DIH activities, and their likely contribution towards the desired EOSC DIH impact.
- **Leading indicators** aim at assessing the enabling factors allowing for the attainment of the desired effects. Specifically, these indicators will aim at collecting data related to the relevance, coherence, and added value of the EOSC DIH. Leading indicators are of key importance for the capacity of the monitoring system to conduct an 'ongoing' evaluation of the adequacy of the EOSC DIH design and implementation, providing an early indication of the eventual need for corrective measures.
- **Impact indicators** relate to the results (mid-term effects at the meso-level, i.e. research communities and industry sectors) and impacts (longer-term effects on society, i.e. the macro-level) of the EOSC DIH activities. These will primarily serve the final evaluation of the EOSC DIH in the framework of the EOSC Future project. Seeing the relatively short time frame of the EOSC Future project, the focus will be on the identification of indicators related to the mid-term results.

In line with international good practice, there will be a mix of **qualitative and quantitative** indicators, reflecting different data collection and analysis methods. **Limiting the number** of indicators will be required in order to avoid unneeded complexities and excessive demands for information that might disturb the normal functioning of EOSC DIH implementation. In this process, alignment will be ensured also with the M&E practice and standards in the EOSC Future project and the wider EOSC and DIH landscape.

The **quality** of the indicator framework will be ensured by adopting the 'RACER' criteria:

Table 5-8: RACER criteria

RACER criteria	
Relevant	Is there a clear link between the indicator and the objective to be reached? Where change is being assessed, is baseline data available?
Accepted	Have the stakeholders been consulted on the construction of the indicators? Is the indicator actively used in connection with the intervention itself?
Credible	Are there definitions for each indicator including statements of what the indicator shows and how data are collected?
Easy	Are indicators updated to reflect changes to interventions?
Robust	Are there established criteria or characteristics for assessing the quality?

When defining the indicators, also the eventual use of impact assessment models for the final evaluation of the EOSC DIH business pilots will be considered and the data that would need to be collected for these models. An example would be the model assessing impacts in terms of readiness levels, i.e. [5]

- **Technology readiness Level (TRL)**: the maturity level of development and testing of technology, product, service, or idea.
- **Customer Readiness Level (CRL)**: the maturity level for market demand and customer interest for the project/product.

- **Business readiness level (BRL)**: the maturity level of the economic viability and feasibility of the project/product's revenue model and scalability.
- **Intellectual property Readiness Level (IRL)**: the readiness level of the intellectual property status and related protection.
- **Funding Readiness Level (FRL)**: the readiness level for securing the necessary funding to bring the project/product to market.
- **Human resource Readiness Level (HRL)**: the maturity level of the SME team's skills and alignment.

Finally, the currently established EOSC DIH **Key Performance Indicators (KPIs)** (see Section 6, below) will be refined against which the success of the EOSC DIH can be measured. They will include indicators at the output, outcome, and result levels, and will wherever possible be formulated in terms of change versus a baseline.

5.3.3 O7.2 Implement the M&E system

5.3.3.1 A7.3 Ongoing monitoring of the EOSC DIH operations and refining of the indicator framework

Throughout the remaining EOSC Future working period, the M&E team will take charge of the ongoing data collection related to the effectiveness, efficiency, relevance, coherence, and added value of the EOSC DIH. This routinely gathering and regular reporting of information collected will allow for in-time informed decision-making on corrective measures where needed, and thus enhancing the potential of EOSC DIH to attain its expected effects.

Data will be collected related to the defined process, output, outcome and leading indicators, using the most appropriate methods and data collection tools. A close collaboration with the EOSC Future WP1 Task 1.4 'Exploitation and Innovation Management' will be established in order to overcome duplications as well as feed in the overall EOSC Future monitoring process.

The monitoring exercise will be based on desk research, interviews and where appropriate, satisfaction and end-of-project surveys, in close collaboration with the other Activities in WP8 T8.2. and other relevant WPs/tasks in the EOSC Future project. For example, the ongoing alignment of the EOSC DIH activities with the researchers' needs will be monitored in collaboration with WP8 T8.1 in the context of the survey that this WP will conduct every 6 months to collect user input and feedback on the procurement activities and industry services, while the monitoring of the alignment with the industry needs and requirements will take place in the context of the Activity 8.2.1 and Activity 8.2.2. The monitoring of the ongoing alignment with the context in terms of EOSC- and DIH-related initiatives and policies will benefit from close collaboration with Activity 8.2.1 as well as the activities in the EOSC Future WP2 T2.3, specifically the Activity 2.3.1 - Landscape Mapping and Analysis.

The M&E team will report internally on its activities and findings on a monthly basis. Periodic internal monitoring reports will aggregate the data collected and provide a comprehensive view of the EOSC DIH progress to attaining its targets and objectives as well as the successes and challenges emerging.

5.3.3.2 A7.4 Conduct the EOSC DIH evaluation

In the last quarter of the EOSC Future project timeline, the activities of the EOSC DIH M&E team will focus on the integrated analysis of the data collected during the project timeframe and the drafting of the EOSC DIH (self)evaluation report.

Taking a pronounced analytical stand, the evaluation will have a 'summative' function (i.e. reporting on the achievements of the EOSC DIH) as well as a 'formative' one, formulating the 'lessons learnt' and providing input and recommendations for future initiatives. As mentioned in the section on the M&E System conceptual framework (Section 4.3.2.2, above), the evaluation will assess the relevance, effectiveness, efficiency, coherence, and added value of the EOSC DIH. Methods will include the meta-analysis of the monitoring data, combined with additional interviews and any other method needed, depending on the focus and characteristics of the 'result' indicators defined.

6 KPIs

The following table describes the initial KPIs defined to assess the performance of the EOSC DIH. The baseline is based on the results from the EOSC-hub project (end of March 2021). Two checkpoints are considered during the project, the first one in September 2022 (M18) of the project and September 2023 at the end of project (M30).

As mentioned in 5.3.2.2 above, these KPIs will be revised based upon the M&E system. The final KPIs will be include result-oriented indicators, allowing for the assessment of progress towards the specific objectives of the EOSC Future DIH (see Figure 4-1).

Table 6-1: KPIs of the EOSC DIH

KPI	Baseline 2021	Sept. 2022	Sept. 2023
Number of individual SMEs directly supported by EOSC DIH	24	40	60
Number of strategic DIH partnerships with multipliers and added value service providers	8	12	15
Number of regional DIHs connected	2	6	10
Number of directly informed SMEs and innovators	30	150	200
Number of industry events and direct participation in industry events	12	20	25
Number of services offered in EOSC Marketplace, thanks to DIH	4	6	8
Number of EOSC-related project collaborations	4	6	8

7 Conclusions

This document has shown how the EOSC DIH planned activities directly build on the foundation laid by the EOSC-hub project. Not only re-using many tools, processes, procedures, documentation, and community, but also taking strongly into consideration lessons learnt and recommendations as direct input to the activity plan to be carried out through EOSC Future.

These lessons learnt have also led the refinement of the EOSC DIH Mission, Vision, Value proposition and Objectives, where the EOSC DIH continues its long-term vision to serve as both an innovation channel for EOSC as well as a principal mechanism for engaging the private sector. The strategy to achieve this vision is aligned with detailed objectives matched with concrete plans and operational activities.

At the heart of the EOSC DIH is providing direct support to industry by facilitating services and expertise from across the EOSC to increase the digitization of EU industry. This is a widening strategy of the DIH to go beyond only the services available from EOSC DIH partners. In addition, procurement of services has been added to the workplan as a means for driving open innovation for the benefit of EOSC.

A more mature approach has been introduced for monitoring the impact of the DIH and the businesses participating within it.

Overall, the EOSC Future project is playing a key role in enabling the EOSC DIH to expand and become the 'de-facto' long-term mechanism for industry engagement. Future Deliverable D8.5 - Digital Innovation Hub Final Results and Sustainability Plan will provide the overview of the EOSC DIH activities, including business pilots carried out, technical support provided, and assessment of results achieved.

8 Appendix A: Onboarding new pilots' procedure

	Resp.	Action	Prerequisites
1	WP8 Leaders	If via business@eosc-dih.eu or website contact form: • In order to avoid having a single point of failure or multiple team members replying, it was agreed during a WP8 bi-weekly meeting to first agree via the dedicated WP8.2 group on Slack for who would be the best person or at least an available person to reply. • A starter email template is available to facilitate anyone who will need to reply, feeling free to adapt to personal preferences. If from informal discussions, contact WP8.2 Manager to decide who will be the Pilot Contact Lead. If from internal discussions with a clear Pilot Contact Lead, skip to Step 2.	
2	Pilot Contact Lead	Sets up call to discuss further details: • Requested services, potential timelines • Technical requirement specification as much as possible	*Agreed via WP8.2 partners to proceed Keep business@ in CC*
3	Pilot Contact Lead	Inserts details in the 'Use Case Requirements and Offer Collection' tab of the EOSC DIH Budget Google Spreadsheet	*Obtained requirements*
4	Pilot Contact Lead	Prepares a 'Call for Service Offers' to be sent to the relevant EOSC service provider contacts. As there is currently no single mailing list that can reach these contacts, the relevant contact list is between the WP8 partners and the pilot contact lead Draft email template available.	
5	Pilot Contact Lead	• Collects all service offers • Inserts details in the 'Use Case Requirements and Offer Collection' tab of the EOSC DIH Budget Google Spreadsheet	
6	WP8 Leaders	Reviews service offers and selects the best candidate using the following criteria: • Services and technical components matching the request requirements • Availability and reliability • How many other pilots have the providers already supported (spread opportunities) • Costs	
7	WP8 Manager	• Approves costs • Updates 'Financial/Resources Summary ' tab of the EOSC DIH Budget Google Spreadsheet	
8	Pilot Contact Lead	Informs all contacts individually: • Provider(s) selected • Provider(s) not selected along with a brief rationale	*Approval by WP8.2 Manager*
9	WP8 Manager	Informs the relevant partners(e.g. for the partnership projects services) that a new entry has been made to the EOSC DIH Budget Google Spreadsheet with the following information: • Use Case Name • EOSC Service Provider(s) • Total cost/PMs • Start date of the activity • Duration of the activity	

10	Relevant partners	• Confirms eligibility (e.g. for the partnership projects services)	
11	Pilot Contact Lead	Call with service providers to check the agreement clauses regarding joint IPR (not required for pilots only accessing computing service). Prepares and finalizes the agreement between EOSC DIH and the pilot partner. Depending on the agreement and the requirements of the pilot partner, this can be in the form of: • SLA (Template); Other *Important that the activities are defined and agreed for clarity of work to be carried out for the pilot itself, publication on the EOSC Future website, promotion, and reporting If the service levels are not part of any of the above-mentioned agreements, then: • OLA (template) between EOSC DIH and the Service Provider should be defined	
12	Pilot Contact Lead	• Coordinates Pilot • Involves relevant personnel • Communicates to WP8.2 Manager related to any issues • Seeks approval from WP8.2 Manager prior to promising any additional budget to the given pilot	
13	Pilot Contact Lead	• Informs the WP8.2 Manager that the pilot has concluded • Provides a report of overall pilot activities, major outcomes, etc.	*Pilot concluded*
14	WP9 Manager	• Updates the 'Financial Summary ' tab of the EOSC DIH Budget Google Spreadsheet with the final technical services provided and financial figures • Coordinates with WP10 for relevant communication and dissemination activities	

9 Appendix B: Summary table of objectives and actions

General Objectives	Specific objectives	Actions
O1. Manage an effective and sustainable EOSC DIH	O1.1 Achieve effective management of the EOSC DIH operation	A.1.1 Define roles and responsibilities for the EOSC DIH team. A1.2 Define clear procedures and rules for the EOSC DIH operation and activities. A1.3 Define the timeline for main activities and supervise deliverables and milestones. A1.4 Monitor human and technical resources allocation and usage. A1.5 Set up and maintenance of collaborative tools (mailing lists, repositories). A1.6 Organise and conduct regular management team meetings.
	O1.2 Coordinate external communication and community building mechanisms to sustainably engage with Industry stakeholders (customers)	A1.7 Maintain the EOSC DIH website and social media channels and enlarge their user base. A1.8 Generate and disseminate communication material to target groups. A1.9 Organize and attend events /conferences and industry related fairs. A1.10 Analyse sustainability models and engage with EOSC Governance
O2. Expand EOSC with Added-value Services	O2.1 Attract new private sector services into EOSC to further grow it with innovative tools and services	A2.1 Explore industry services of EOSC DIH community or other industry opportunities to be onboarded or integrated in the EOSC. A2.2 Conduct the appropriate purchasing mechanism to onboard innovative services enhancing the EOSC and EOSC DIH
	O2.2 Promote the EOSC services with potential exploitation in Industry through the EOSC DIH.	A2.3 Conduct regular meetings and establish clear mechanisms with WP5 to identify and define the exploitation paths of EOSC services through the EOSC DIH.
O3. Integrate EOSC in the pan- European DIH network	O3.1 Increase the EOSC DIH offer with external capacities from regional/ national DIH and innovative projects.	A3.1 Develop partnerships for integrating external technical offers into the EOSC DIH, and into the EOSC Marketplace when appropriate.
	O3.2 Exploit the EOSC DIH offer	A3.2 Identify and define strategic synergies with external multipliers as potential users of the EOSC DIH offer and EOSC exploitable results. A3.3 Participate in European networks and alliances as well as actively contribute to events and conferences (International, National, and regional level).
O4. SME integration in the EOSC DIH community	O4.1 Involve companies in the EOSC DIH	A4.1 Run campaigns for business pilots. A4.2 Evaluation of candidates according to the EOSC DIH strategy and the service offer.
	O4.2 Mature mechanisms to ensure support for pilots	A4.3 Analyse technical requirements and fulfil the specific agreements to cover them (SLA/OLA).
O5. Successful adoption of innovative EOSC services by industry pilots	O5.1 Support Business pilots	A5.1 Develop detailed work plans including objectives, milestones, KPIs, IPR and exploitation plans. A5.2 Provision and enable access to the requested EOSC services. A5.3 Provide first-level support and monitoring progress. A5.4 Support the SMEs with the process of onboarding of services into EOSC Exchange.

O6. Contribute to generate added value to the digital market	O6.1 Increase the impact of the pilots	A6.1Define pre-commercial agreements for continued business relationships. A6.2 Help SMEs to identify market/business opportunities and assess opportunities for further innovation (i.e. direct support, project innovation management activities).
O7. Establish a quality framework to ensure continuous improvement of EOSC DIH	O7.1 Design the EOSC DIH monitoring and evaluation (M&E) system.	A7.1 Refine the EOSC DIH objectives tree and intervention logic. A7.2 Define the indicators framework and KPIs.
	O7.2 Implement the EOSC DIH M&E system.	A7.3 Ongoing monitoring of the EOSC DIH operations. A7.4 Conduct the EOSC DIH final evaluation.

References

[1] Eosc-portal.eu. 2021. EOSC Portal. [online] Available at: https://eosc-portal.eu/
[2] EOSC DIH https://eosc-dih.eu/
[3] Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology. Open Innovation combines internal and external ideas into architectures and systems whose requirements are defined by a business model. Henry Chesbrough, Open Innovation: The New Imperative (2003)
[4] A good analysis and background of this model is provided in the following publication in Harvard Business Review: Is It Real? Can We Win? Is It Worth Doing?: Managing Risk and Reward in an Innovation Portfolio
[5] A good implementation of this model: KTH Innovation Readiness Level™ – A method, visual tool, and resource library guiding the development from early stage idea to innovation on the market