

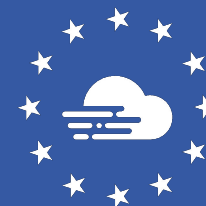
EOSC status and future plans

Ignacio Blanquer

Board of Directors EOSC-A

June the 9th, 2021

EODC Forum 2021



**EUROPEAN OPEN
SCIENCE CLOUD**

Outline and Presentation

- The EOSC Initiative.
- Key Results from several INFRAEOSC-H2020 projects.
- The EOSC Association.

Ignacio Blanquer is professor of the UPV, member of the board of directors of EOSC-A, member of EOSC-hub, WP leader in EOSC-SYNERGY, third party in EGI-ACE and advisor of the Spanish Ministry of Science and Innovation in the area of EOSC.



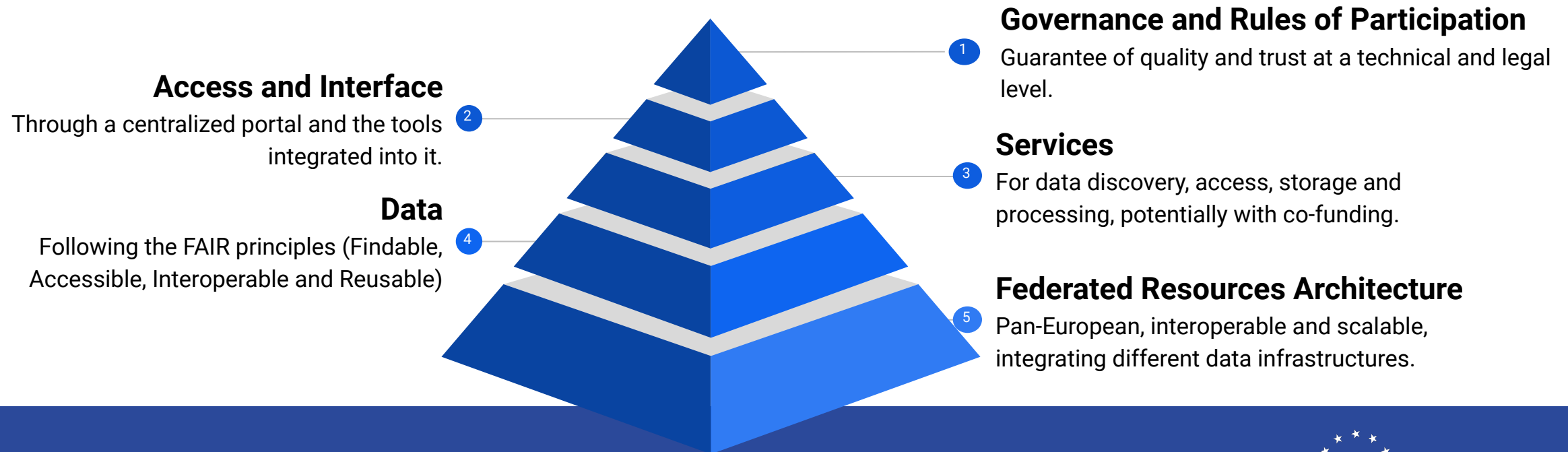
DISCLAIMER: The opinions expressed in this presentation are solely those of the presenter and may not be necessarily endorsed by institutions appearing.

The EOSC Initiative



EOSC aims to offer the 1.7 million European researchers a virtual environment for open access to services for the reuse of scientific data

- The EOSC initiative was proposed in 2016 by the EC as part of the European Cloud initiative, funded through the so-called H2020-INFRAEOSC-2018-2020 (€ 157M).



INFRAEOSC-H2020 Calls and Projects

EINFRA-12-2017

- Integrating and managing services for the European Open Science Cloud (**EOSC-hub**)
- OpenAIRE Advancing Open Scholarship (**OpenAIRE-Advance**)

INFRAEOSC-01-2018

- Open Clouds for Research Environments (**OCRE**)

**Building
infrastructure
services**

H2020-EU.1.4.1.3.

- Delivering Agile Research Excellence on European e-Infrastructures (**DARE**)
- eXtreme DataCloud (**XDC**)
- Designing and Enabling E-infrastructures for intensive Processing in a Hybrid DataCloud (**DEEP-HybridDataCloud**)
- European e-Infrastructure for Extreme Data Analytics in Sustainable Development (**EUXDAT**)
- Connected Open Identifiers for Discovery, Access and Use of Research Resources (**FREYA**)

INFRAEOSC-04-2018

- ENVironmental Research Infrastructures building Fair services Accessible for society, Innovation and Research (**ENVRI-FAIR**)
- Providing an open collaborative space for digital biology in Europe (**EOSC-Life**)
- European Science Cluster of Astronomy & Particle physics ESFRI research infrastructures (**ESCAPE**)
- Photon and Neutron Open Science Cloud (**PaNOSC**)
- Social Sciences & Humanities Open Cloud (**SSHOC**)

**User
Communities**

INFRAEOSC-02-2019

- Co-designed Citizen Observatories Services for the EOS-Cloud (**COS4CLOUD**)
- Interactive & agile/responsive sharing mesh of storage, data & applications for EOSC (**CS3MESH4EOSC**)
- INODE - Intelligent Open Data Exploration (**INODE**)
- Novel EOSC services for Emerging Atmosphere, Underwater and Space Challenges (**NEANIAS**)
- Transforming Research through Innovative Practices for Linked interdisciplinary Exploration (**TRIPLE**)

INFRAEOSC-05-2018-2019 a/c

- EOSCsecretariat.eu (**EOSCsecretariat.eu**)
- Fostering FAIR Data Practices in Europe (**FAIRsFAIR**).

INFRAEOSC-06-2019

- Enhancing the EOSC portal and connecting thematic clouds (**EOSC Enhance**)

**Building
EOSC**

INFRAEOSC-05-2018-2019 b

- EOSC-Nordic (**EOSC-Nordic**)
- Coordination and Harmonisation of National Initiatives, Infrastructures and Data services in Central and Western Europe (**EOSC-Pillar**)
- European Open Science Cloud - Expanding Capacities by building Capabilities (**EOSC-synergy**)
- EOSC Photon and Neutron Data Services (**ExPaNDS**)
- National Initiatives for Open Science in Europe (**NI4OS-Europe**).

INFRAEOSC-03-2020

- Integrating and managing services for the European Open Science Cloud (**EOSC-Future**)

**New
projects**

INFRAEOSC-07-2020

- Copernicus - eoSC AnaLytics Engine (**C-SCALE**)
- Data Infrastructure Capacity for EOSC (**DICE**)
- EGI Advanced Computing for EOSC (**EGI-ACE**)
- OpenAIRE-Nexus Scholarly Communication Services for EOSC users (**OpenAIRE Nexus**)
- REsearch Lifecycle mAnagement for Earth Science Communities and Copernicus users in EOSC (**RELANCE**)

Strategic documents in the context of EOSC

<https://www.eoscsecretariat.eu/eosc-governance/eosc-executive-board-outputs>



EOSCArchitecture
Executive Board Working Group

- Scholarly Infrastructures for Research Software
- PID Architecture for the EOSC.
- EOSC Authentication and Authorization Infrastructure (AAI).
- EOSC Architecture WG view on the Minimum Viable EOSC.
- EOSC Interoperability Framework.



EOSCFAIR
Executive Board Working Group

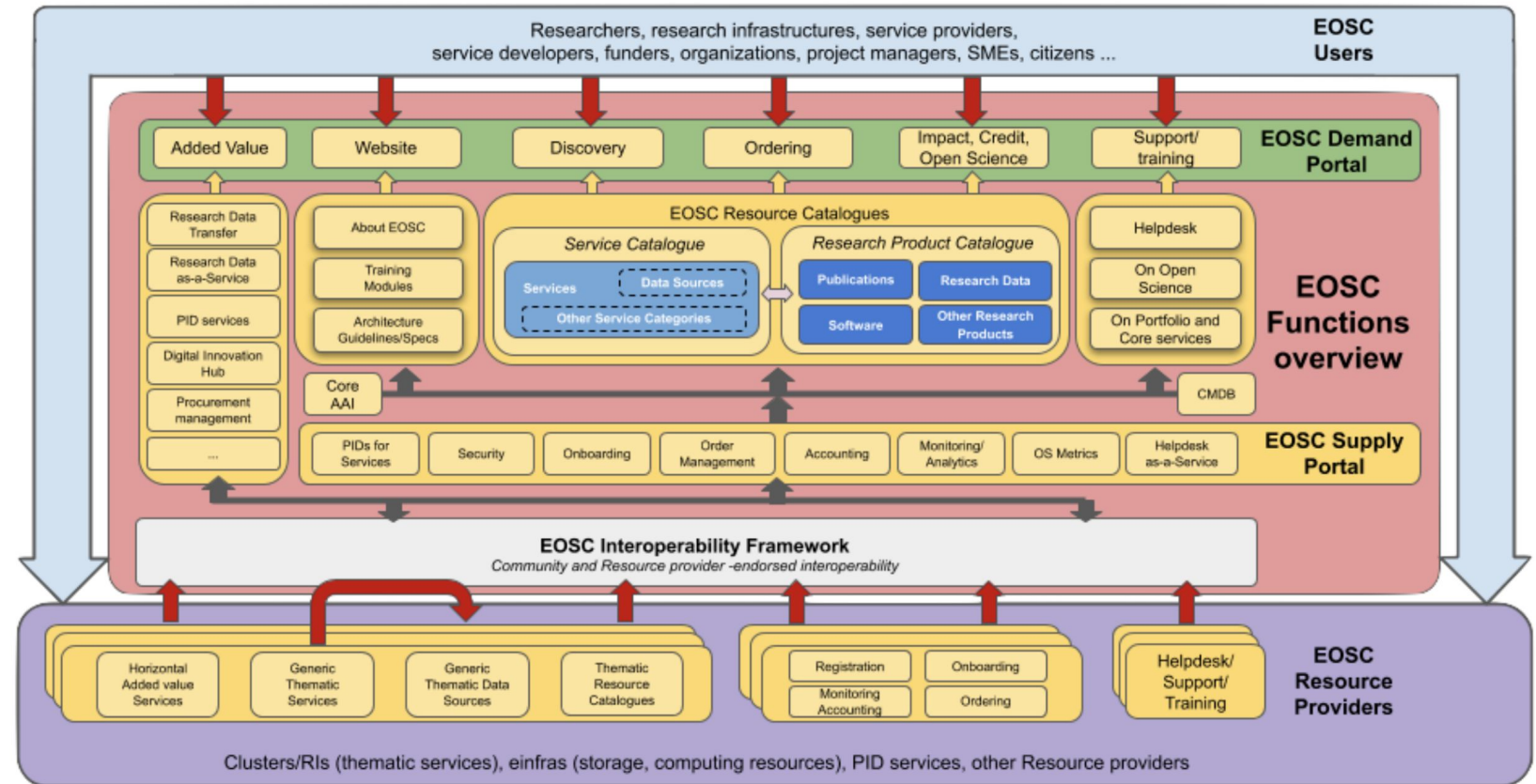
- Six Recommendations for Implementation of FAIR Practice.
- Recommendations on FAIR Metrics for EOSC.
- Recommendations on certifying services required to enable FAIR within EOSC.
- A Persistent Identifier (PID) policy for the European Open Science Cloud.

EOSC Architecture, Technical Requirements & Services

- EOSC Architecture WG View on the Minimum Viable EOSC (doi: 10.2777/492370)
 - Defines the MVE concept and the Proposed Functions of the EOSC Core and MVE: PID Services; Portal, Catalogues & Orders; Data Transfer and Access Services, AAI & Security; Helpdesk; Collaboration Support Services; Monitoring, metrics and Accounting; EOSC Interoperability Framework.
- EOSC Interoperability Report (doi: 10.2777/620649)
 - Defines Technical Data Interoperability Framework Requirements: AAI Framework, Open Specifications; Ease of Access; SLAs; clear PID policy; Coarse & fine-grained datasets.
- D10.2 EOSC Hub Technical Roadmap v2 (<https://documents.egi.eu/document/3705>)
 - Defines the Common services (Cloud Compute, including Containerisation and orchestration; HTC/HPC Specification; Metadata Management and Data Discovery; PaaS Solutions; Workflow management and user interfaces and Data analytics) and Federation services (Accounting; Helpdesk; Monitoring; Security; Software Quality Assurance; and AAI service).

Overview of the EOSC Architecture

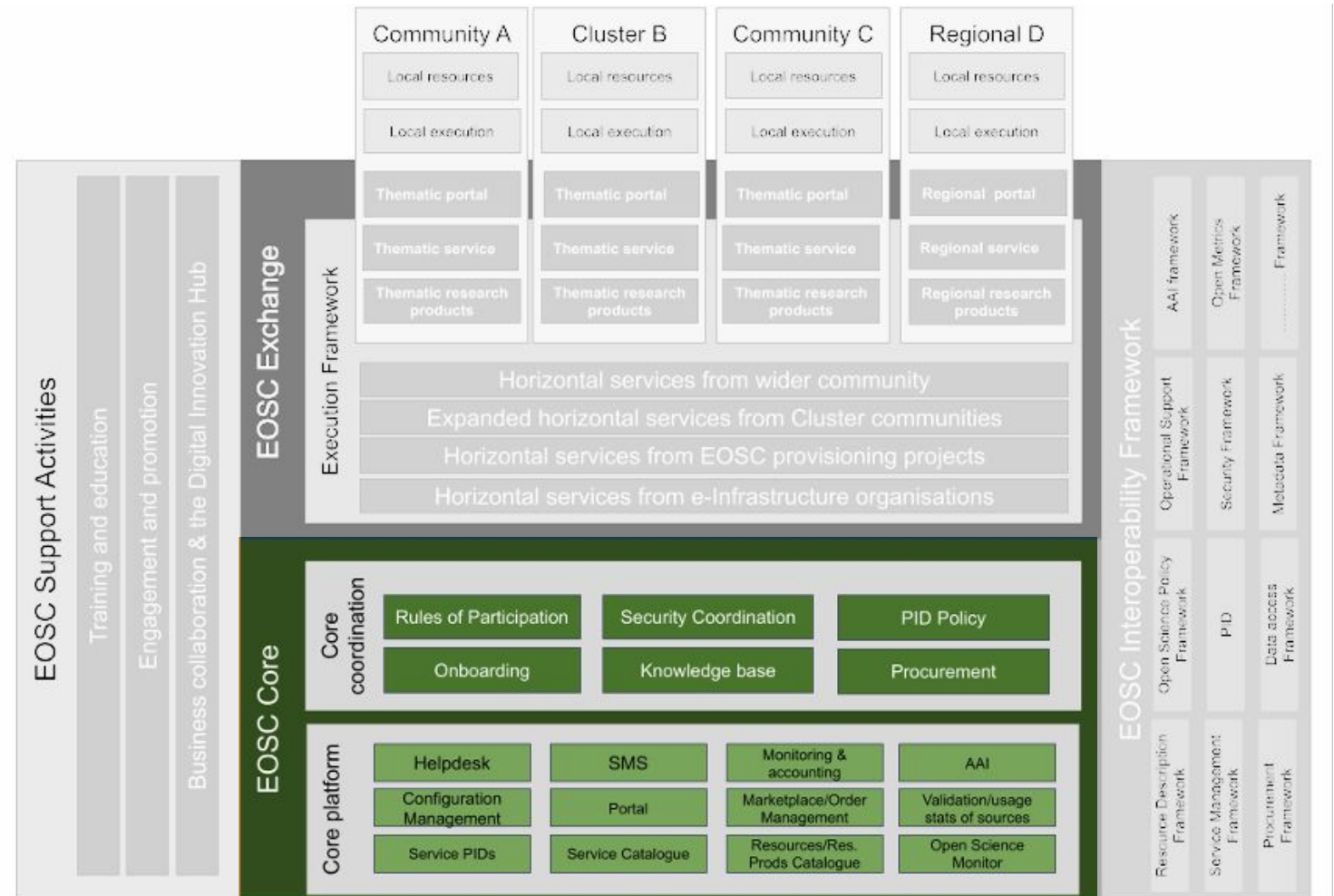
- The EOSC MVE Concept:
 - **EOSC-Core:** Enabling services required to operate the EOSC
 - **EOSC-Exchange:** Federation services registered to the EOSC by RIs and clusters to serve the needs of users.
 - **EOSC Interoperability Framework:** Scientific services provided by RIs and Clusters to the respective communities.



EOSC architecture working group view on the minimum viable EOSC (MVE)

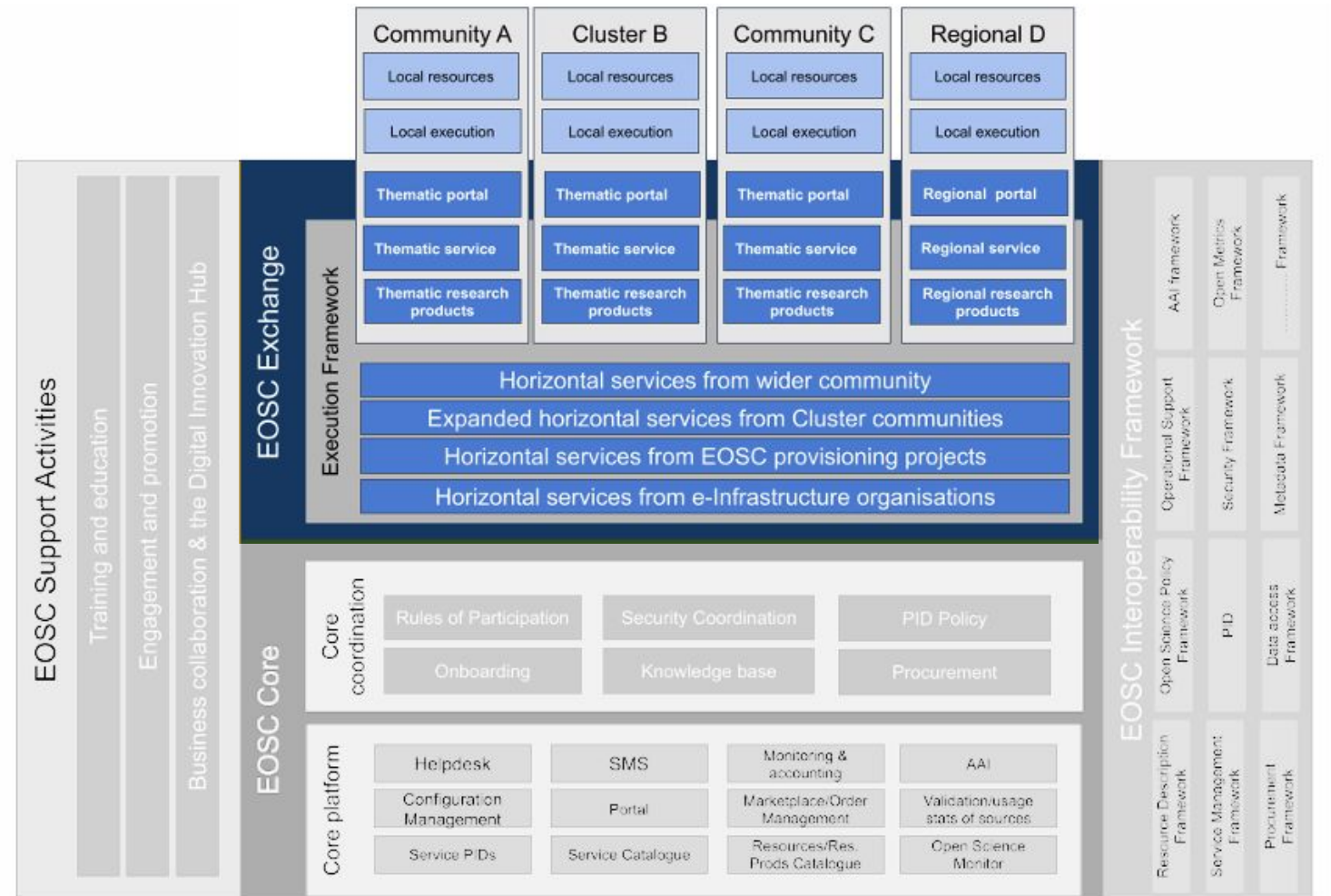
EOSC-Core

- EOSC Portal
- EOSC Resource Catalogue, including a provider portal.
- EOSC Federated AAI.
- Monitoring and Accounting.
- Helpdesk and Security Coordination.



EOSC-Exchange

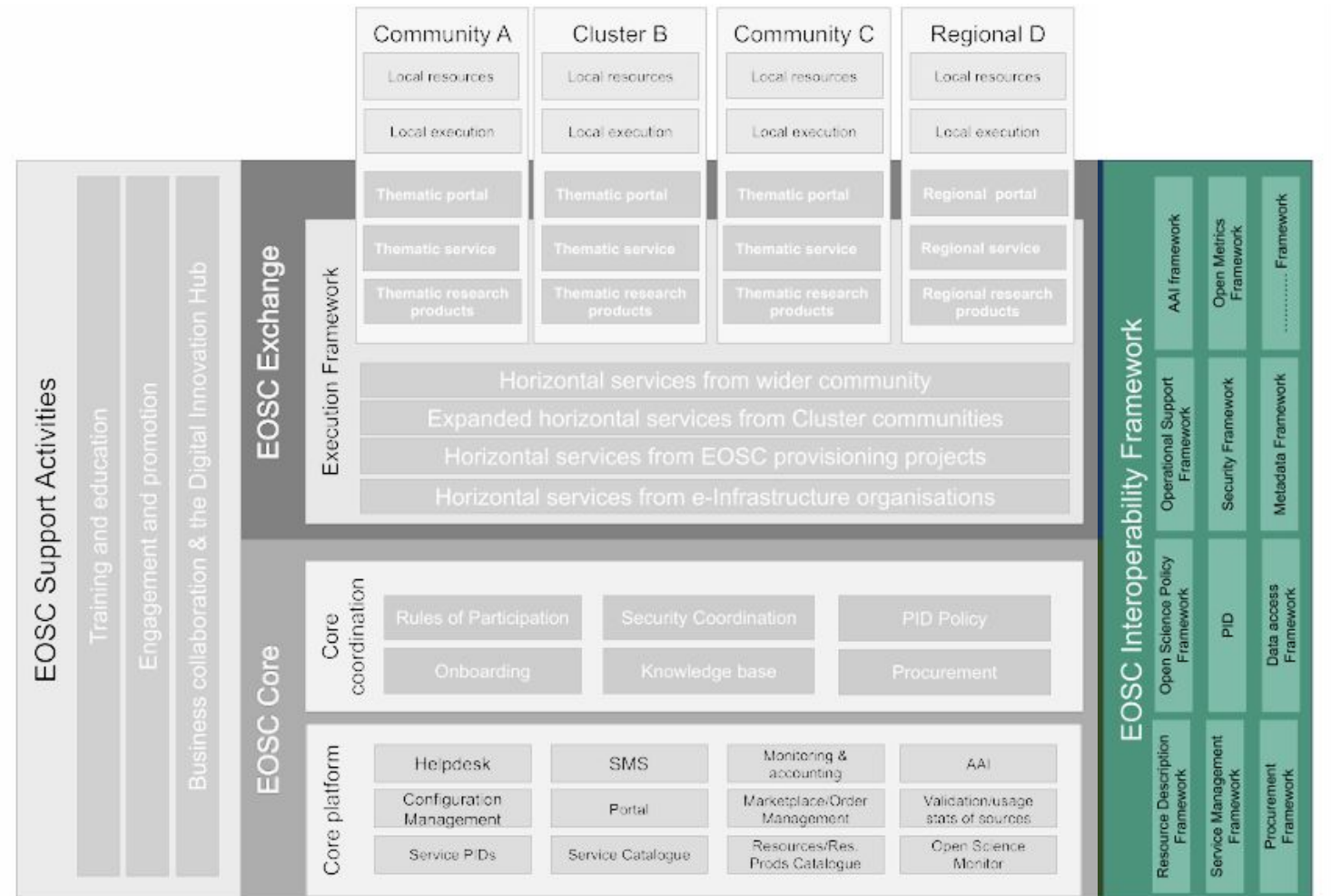
- Horizontal Services provided by e-Infrastructures and Science Cluster Communities.
- Cluster, Community and Regional specific resources such as Thematic/Regional Resources and Portals.
- Execution Framework allowing composability for EOSC resources complying to the EOSC Interoperability Framework.

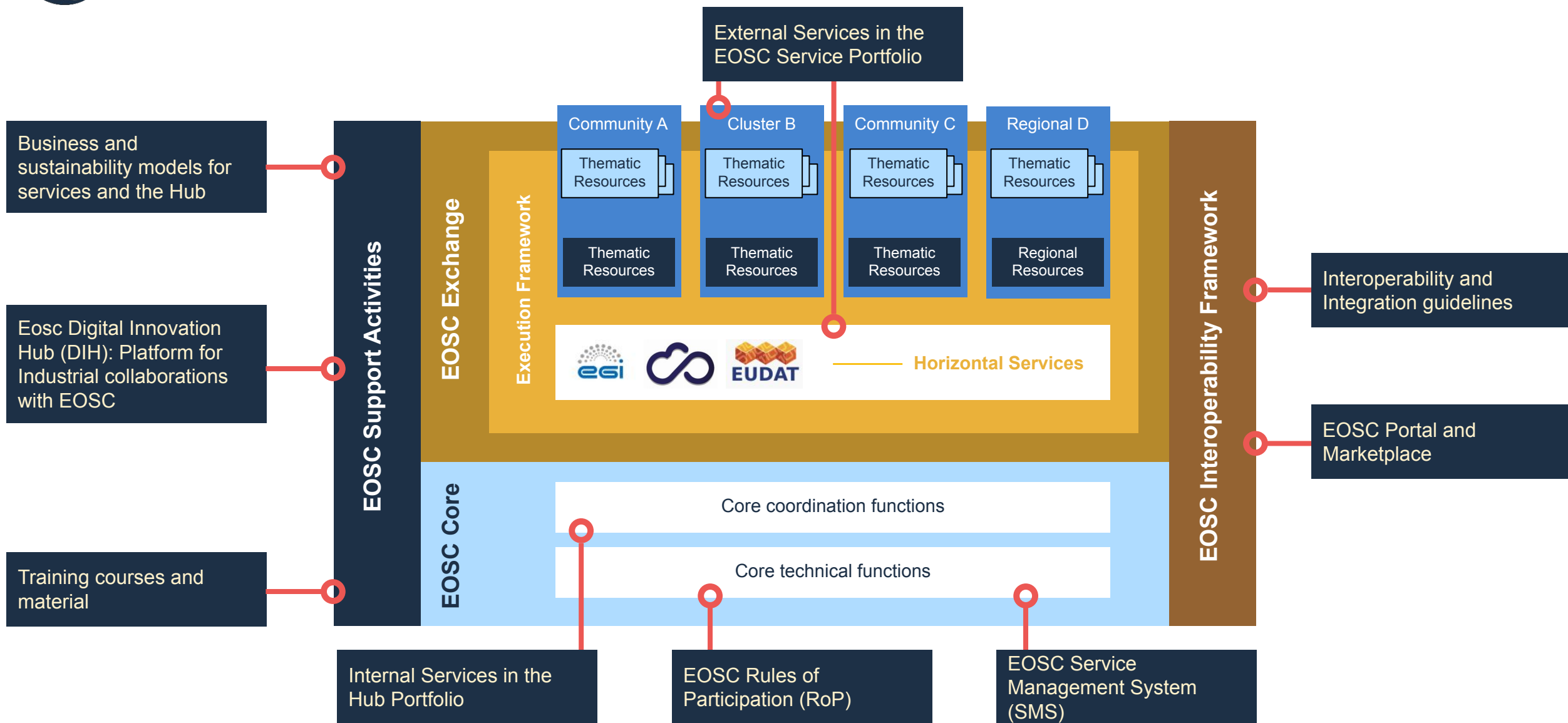


EOSC-Interoperability Framework

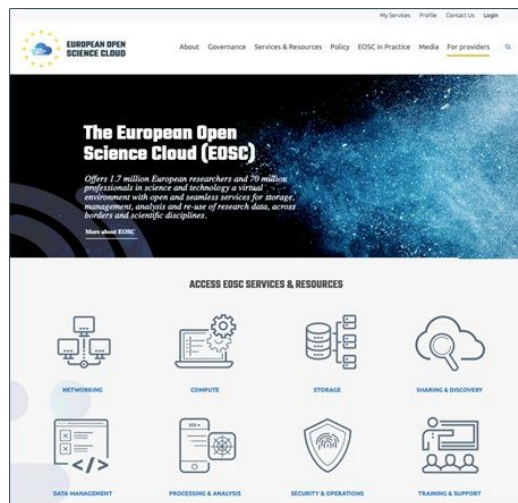
Picture credits: EOSC Future Consortium

- The EIF will enable connecting different kinds of resources across thematic domains and infrastructure boundaries.
- The EIF will provide guidelines for providers to connect resources to EOSC-Exchange and EOSC-Core, supporting the composability of resources.



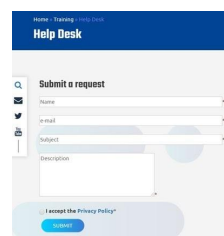
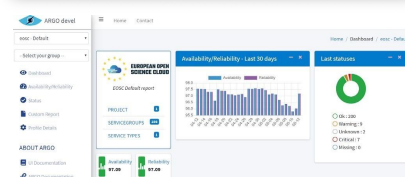
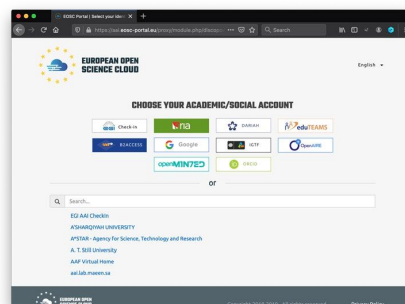


Technical Services Implementation



The EOSC Portal, integrated with the AAI Framework, the service monitoring, Helpdesk and Service Order Management tools.

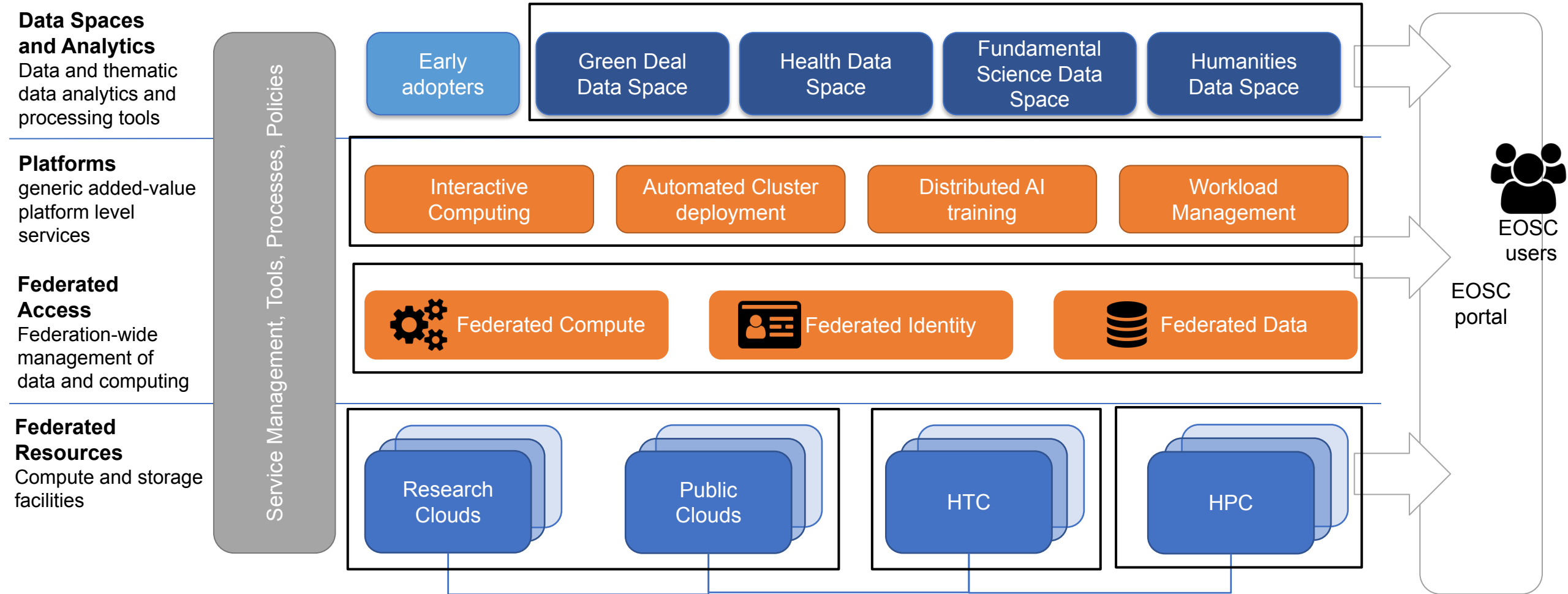
EOSC Core Services



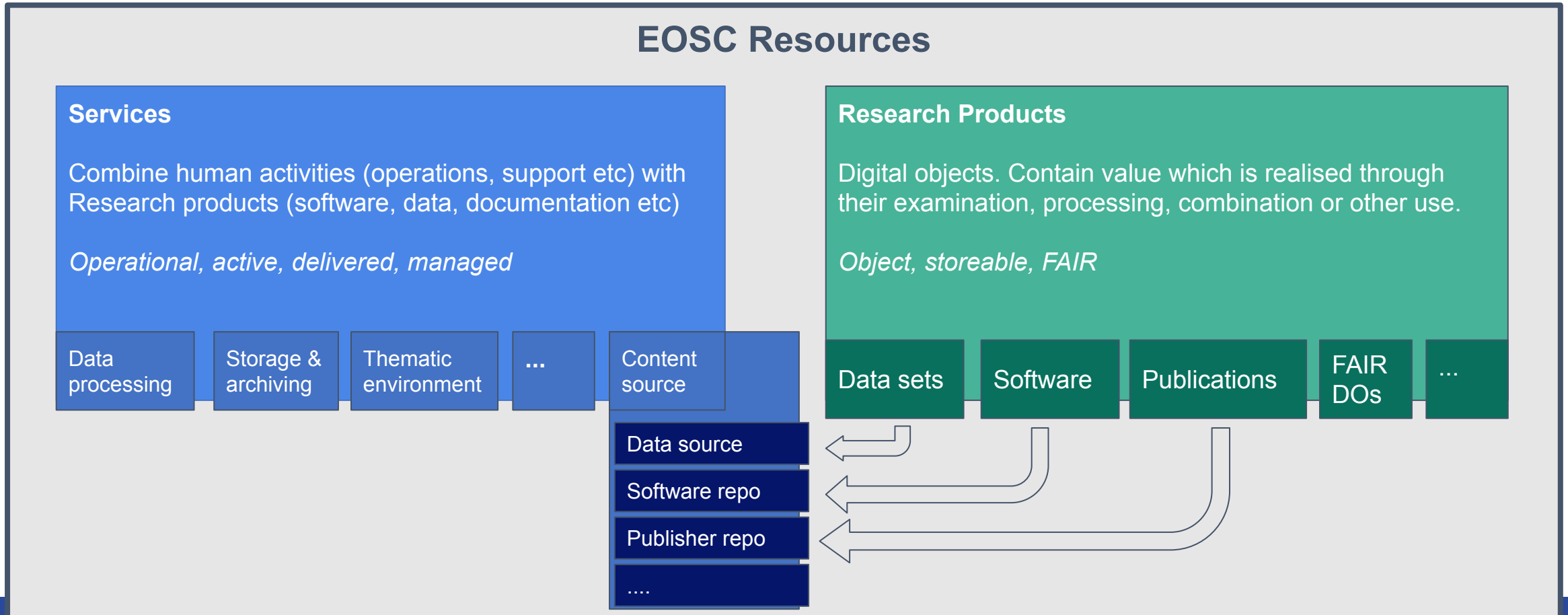
- **Data Discovery and Access** layer through *B2FIND*, *EGI-Datahub* & *B2SAFE* providing transparent cross infrastructure data transfers.
- **Data and Metadata Management** through the integration of *B2SHARE* and *EGI-DataHub*, *B2SHARE* & *B2NOTE*.
- **Data Preservation** through long-term certified Digital Repositories.
- **Sensitive Data Services** for secure data storage, data transfer, deployment and PID assignment.
- **Processing and Orchestration**, covering multi-site cloud orchestration through standard *DevOps* integrated in *EGI Cloud Compute*.
- **Federated Compute** providing Workload Management integrated with data storage services (*EGI-DataHub* and *B2DROP*).

EOSC Common Services

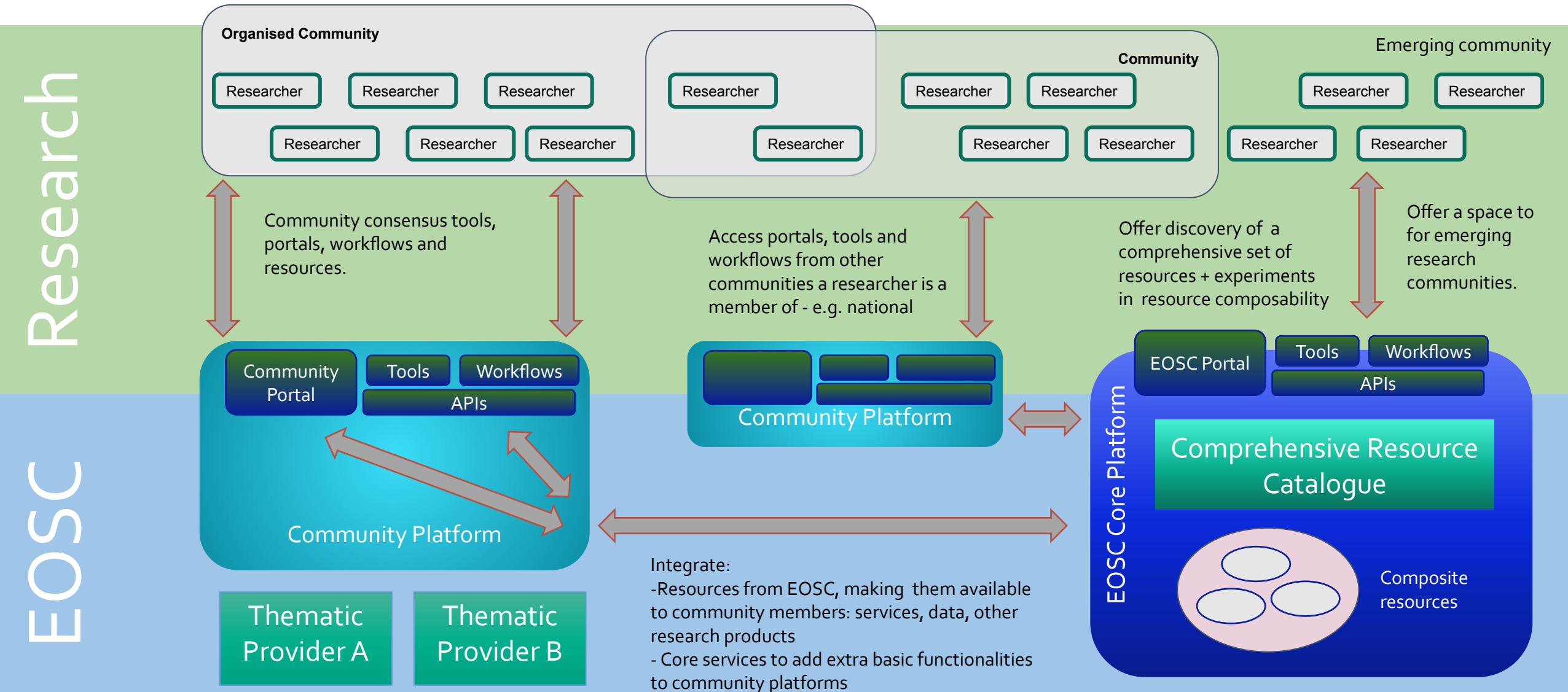
Concept and methodology: Tier service architecture



EOSC Resources



Researcher view: different benefits



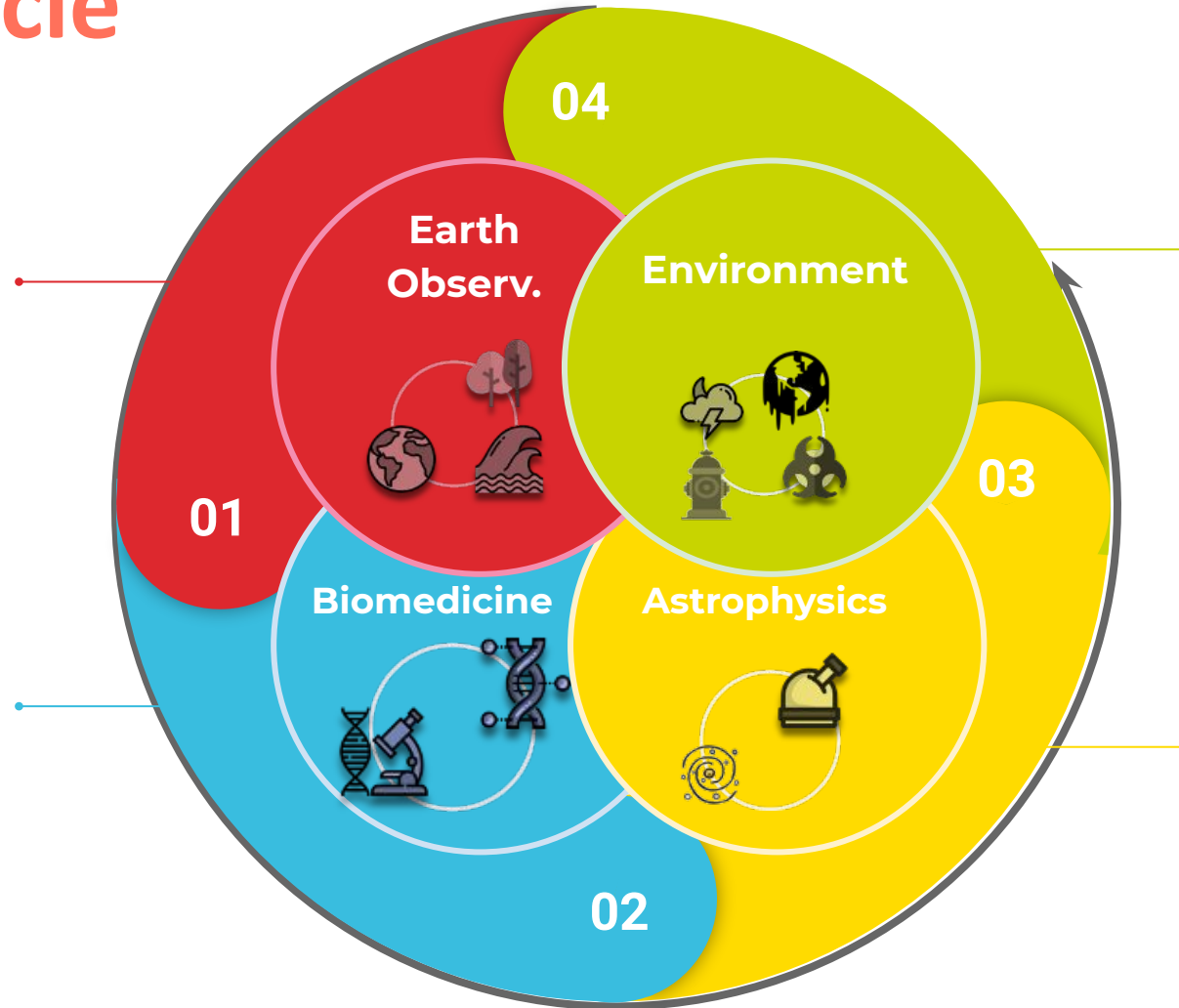
EOSC-SYNERGY: The Thematic Services Virtuous Cycle

Increase the capacity, performance, reliability and/or functionality

By means of best practices for adopting common EOSC core tools and services.

Increase service quality

FAIR data practices and software quality assessment.



Increase relevance of National Thematic Services

By expanding the use of the mature national services in an international scope.

Increase the number of users

By means of the integration in EOSC and the training.

EOSC-SYNERGY - Thematic Services on EOS

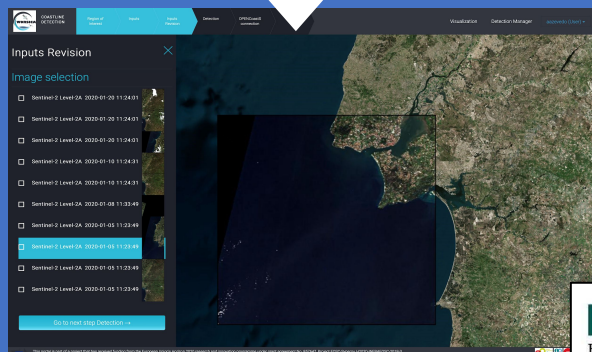


WORSICA

Water Monitoring Sentinel Cloud Platform

A service for the detection of water using satellites, Unmanned Aerial Vehicles & in-situ data. WORSICA can be used for coastline detection, inland water bodies detection and water leaks detection on irrigation networks.

<https://u.i3m.upv.es/v29fw>

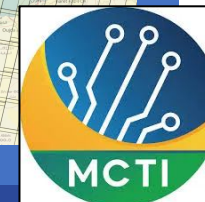
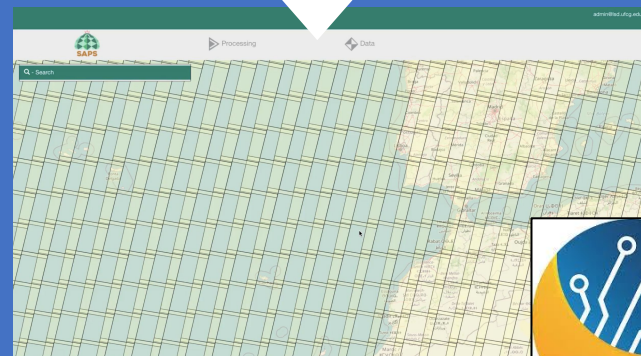


SAPS

Surface Energy Balance Automated Process. Service

Used to estimate Evapotranspiration and other environmental data that can be applied, for example, on water management and the analysis of the evolution of forest masses and crops.

<https://u.i3m.upv.es/0wmso>



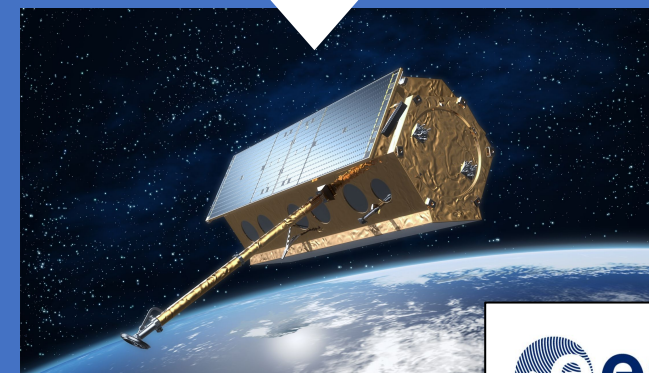
GCore

Acquisition, cataloguing and processing EOS data

G-Core is a production-ready technology used as a service at ESA's and national programs that provides a Data Manager for spatial and non-spatial purposes and a framework for third-party processors.

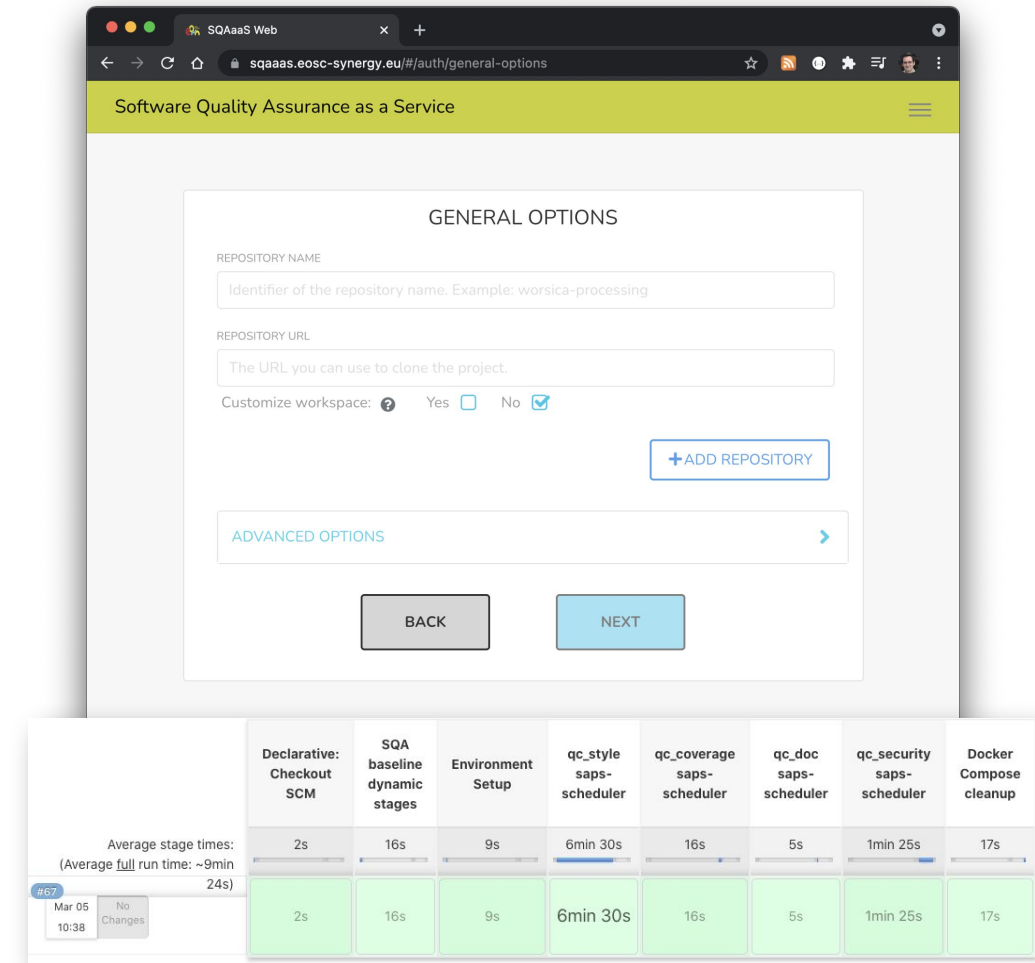
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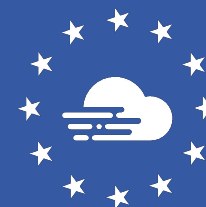


Increase service quality: Software Quality Assessment

- TS Quality increase through three paths:
 - Evaluation of software quality of the components adopted.
 - Evaluation of the software quality of the adaptation performed in the TS in the frame of EOSC-SYNERGY.
 - Evaluation of the service quality by the adoption of monitoring and CI/CD pipelines.



The EOSC Association

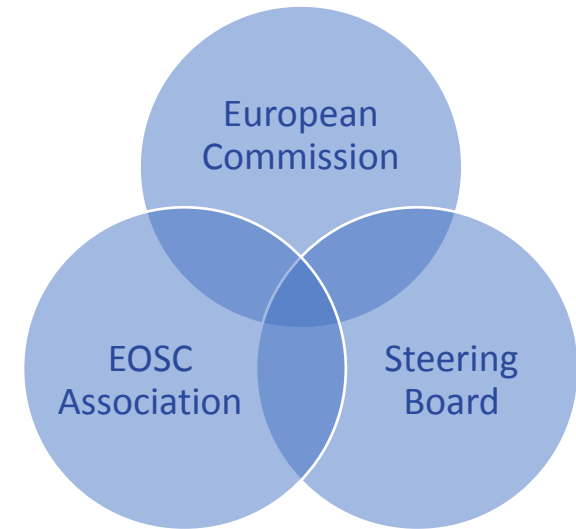


**EUROPEAN OPEN
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EOSC Governance Model 2021-2027

The new governance model agreed with EU countries for the next EOSC implementation phase after 2020 will be tripartite including:

- The EU represented by the **Commission**
- The European research community represented by the **EOSC Association**
- EU countries and countries associated with Horizon Europe represented through a **Steering Board** to be set up in 2021 outside of the EOSC Association



The EOSC Association

Mission: *Advancing Open Science to accelerate the creation of new knowledge, inspire education, spur innovation and promote accessibility and transparency*

- To provide a single voice for advocacy and representation for the broader EOSC stakeholder community.
- To promote the alignment of European Union research policy and priorities with activities coordinated by the Association.
- To enable seamless access to data through interoperable services that address the entire research data life cycle, from discovery to storage, management, analysis and re-use across borders and scientific disciplines

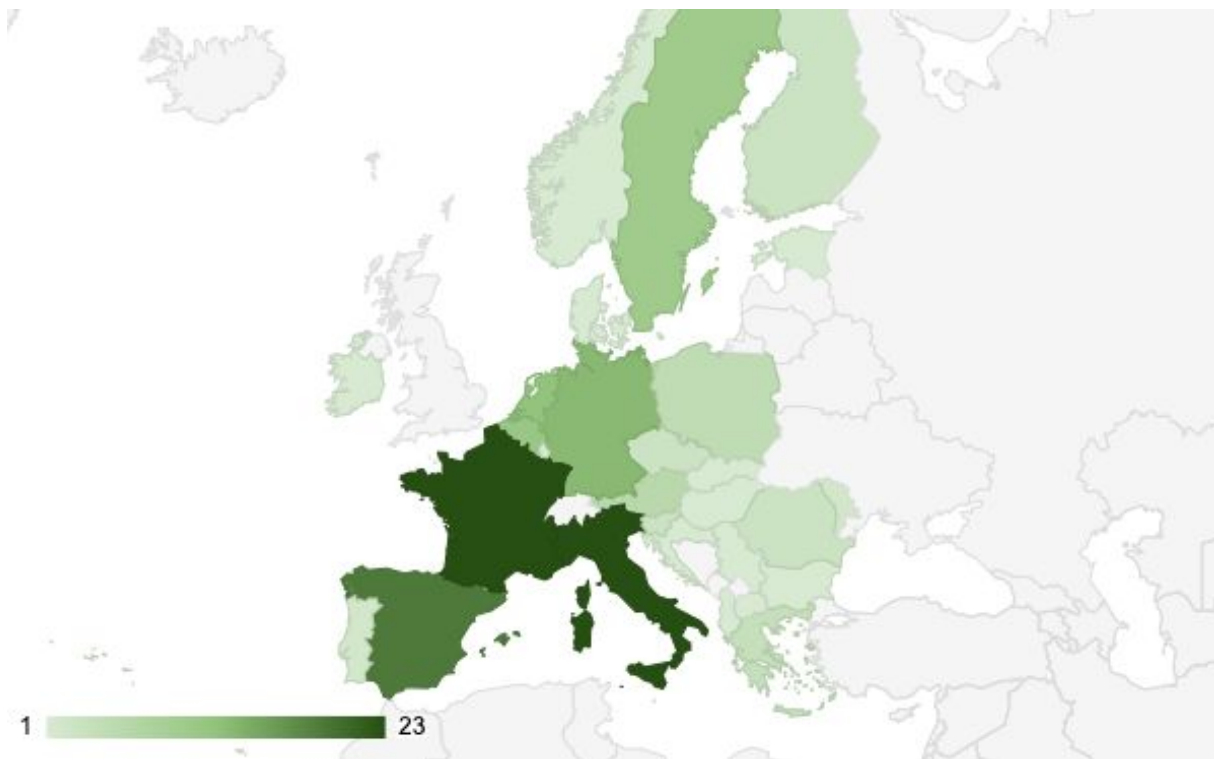
Status: AISBL*

- Formed in July 2020 by founding members CESAER, GÉANT, CSIC and GARR
- Research funders, service providers, representatives of the research community, and intergovernmental organisations
- On 25/6, the EOSC-A will sign a co-programmed partnership with the EC - by belonging to the EOSC-A institutions are part of this partnership.

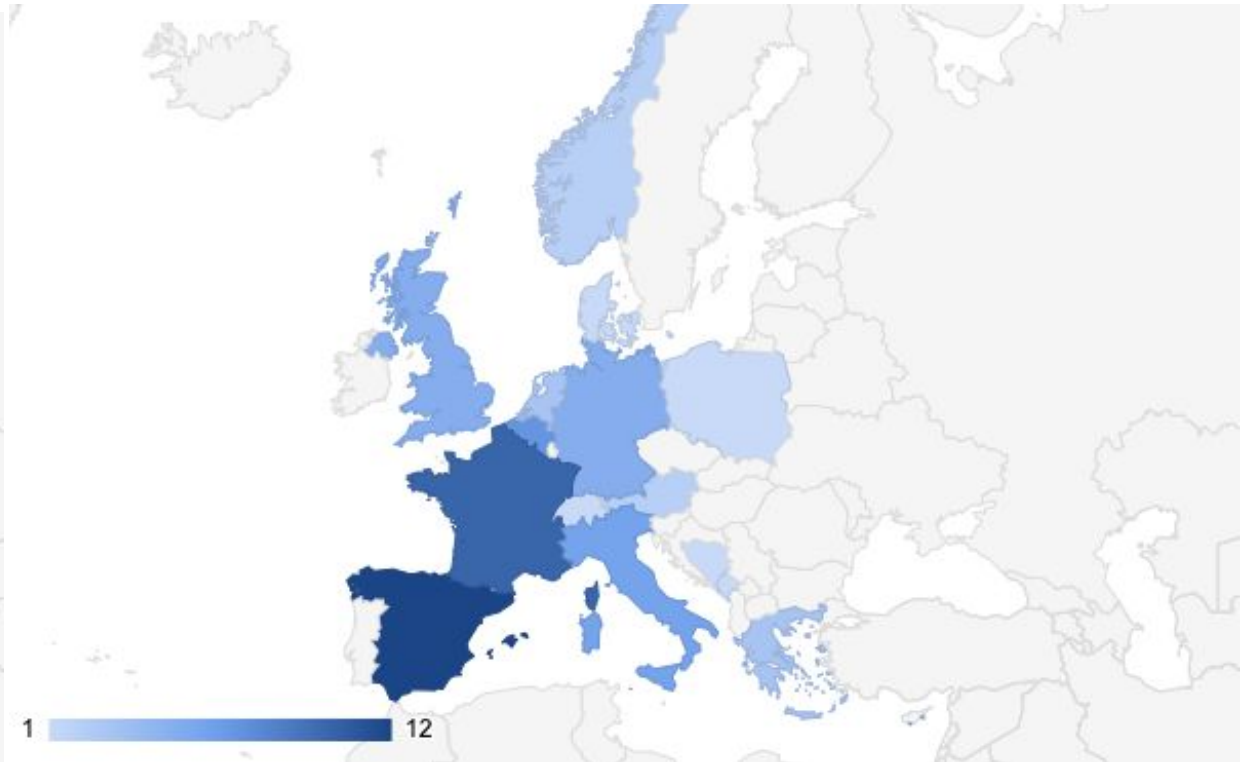
*international non-profit association under Belgian law

EOSC membership by geographical spread

161 Members

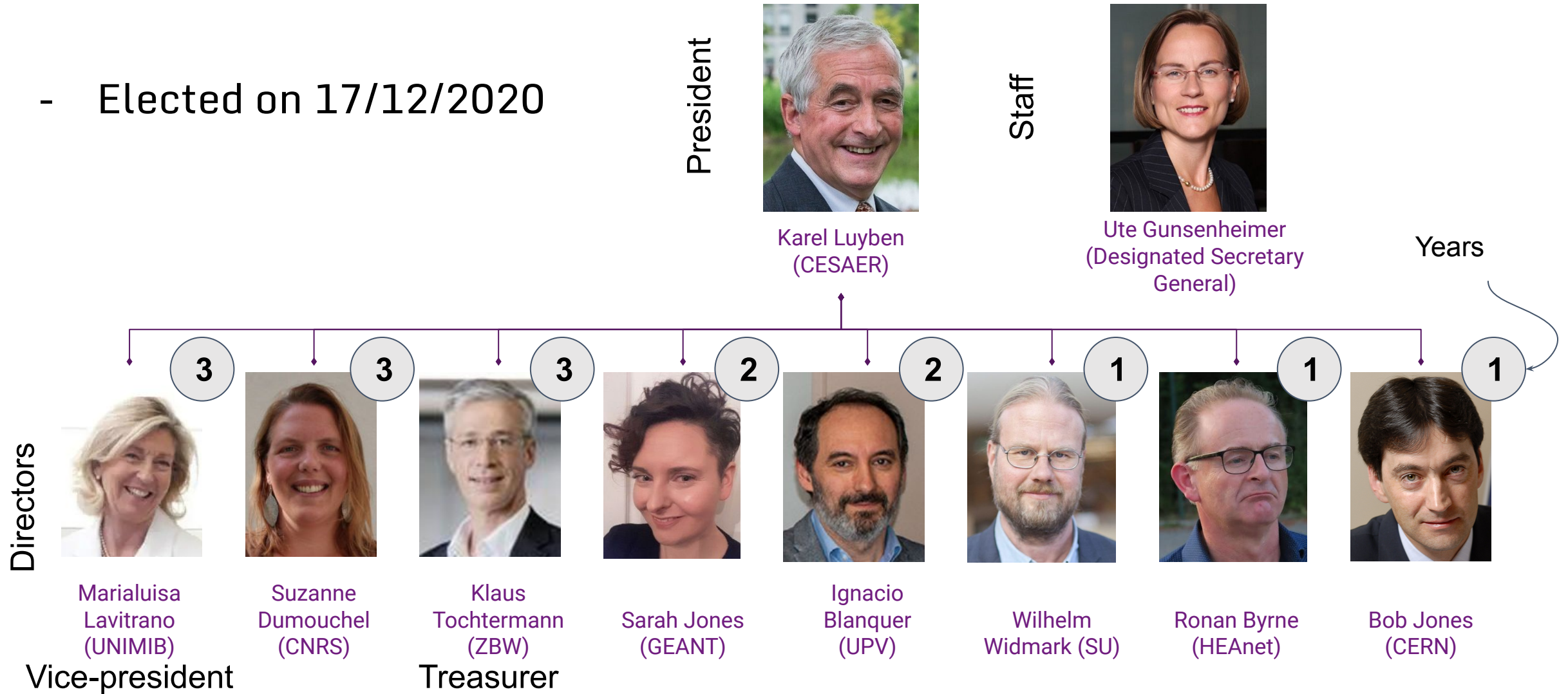


60 Observers



Board of Directors

- Elected on 17/12/2020



Working Groups EOSC-A

Implementation of EOSC

- Rules of Participation compliance monitoring
- PID policy and implementation
- Researcher engagement and adoption

Technical challenges on EOSC

- Technical interoperability of data and services
- Infrastructure for quality research software
- AAI Architecture

Metadata and data quality

- Semantic interoperability
- FAIR metrics and data quality

Research careers and curricula

- Data stewardship curricula and career paths
- Research careers, recognition and credit
- Upskilling countries to engage in EOSC

Sustaining EOSC

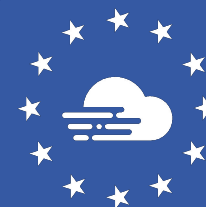
- Defining funding models for EOSC
- Long-term data preservation

A call for participation will be opened soon.

Working principles for Advisory Groups

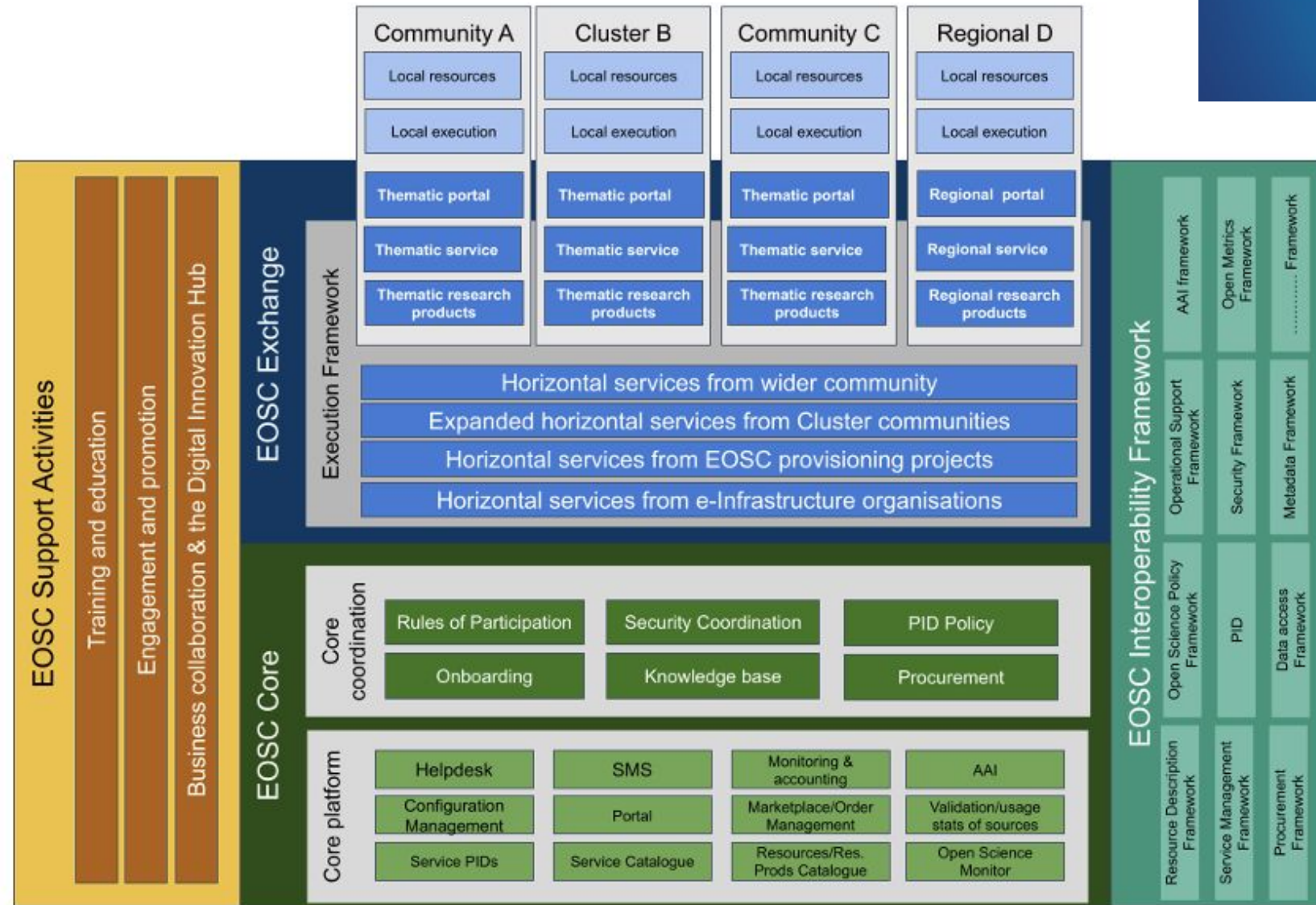
- Research community representatives should be part of all Advisory Groups (AG) to ensure the EOSC infrastructure and services meet their needs
- EOSC Association members & observers should be the primary members of AGs
- Representatives of the key implementation projects should be members of relevant AGs to present work in progress and receive advice and steers from the community
- The ideas and priorities of the EOSC Association Advisory Groups should feed into the Descriptions of Work of the upcoming Horizon Europe projects
- Activities of the AGs should be visible to the wider community via blogs, webinars, email updates, recommendations and outputs
- Cross AG communication should be facilitated as remits will inevitably overlap

THANK YOU



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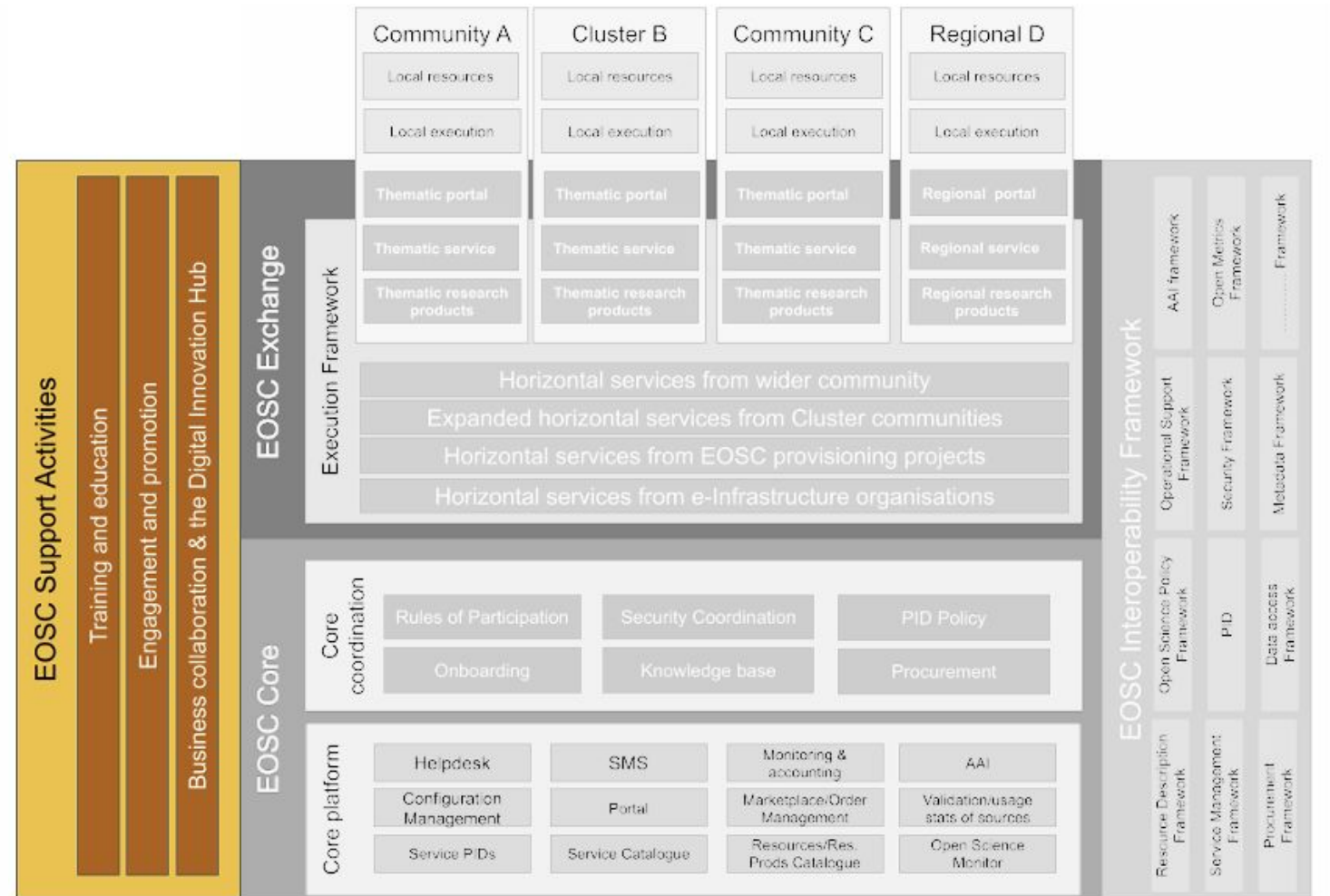
EOSC-Future



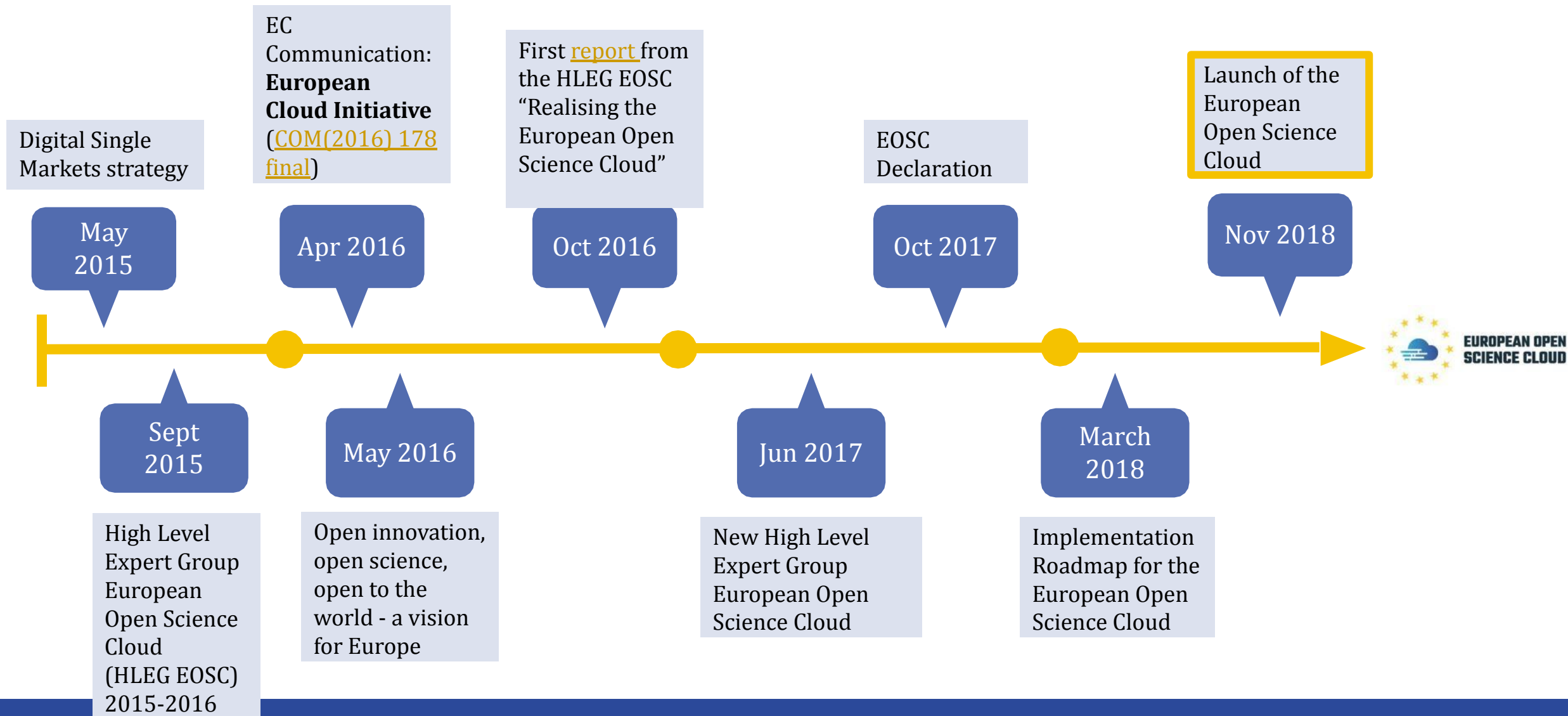
EOSC-Support Activities

Picture credits: EOSC Future Consortium

- They will provide the human activities to engage and promote EOSC:
 - Engagement and Promotion.
 - Training and Education.
 - Business Collaboration and Digital Innovation Hub.



Beginning of the EOSC Initiative



Increase the capacity, performance, reliability and/or functionality: Improvements due to EOSC-Synergy

- Integration of **standardized AAI IdPs** to facilitate user management.
- Improvement of **processing backends** by replacing single computing instances with batch job queues, container management platforms or clients to high-throughput computing backends.
- **Publishing** the output results in persistent repositories.
- **PID annotation** of output data and integration in official harvesters.
- Improving **repeatability** and **platform-agnosticism** by describing the application topologies as code using standard TOSCA language.
- **Self-management** of resources to reduce maintenance costs.



Provider view: Platform level integration

