Results, Dissemination and Impact

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Dissemination level: Public
Disclosing Party: Project consortium
Recipient Party: European Commission

Impact on EOSC Implementation

EOSC architecture components

EOSC-hub

EOSC Core	EOSC Exchange
EOSC Support Activities	EOSC Interoperability Framework

EOSC-Core is defined by the internal services which allow EOSC to operate as a federation

EOSC-Exchange is defined by services and other resources registered into the EOSC to serve the needs of research communities

EOSC Interoperability Framework provides a framework of standards and guidelines to support the interoperability and composability of resources

EOSC Support activities comprise the training, engagement, and other human-centric activities which make EOSC more attractive and easier to use
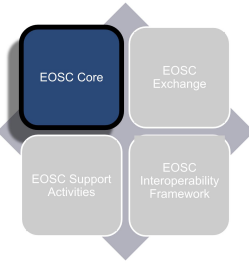
Relevant KERs
- Business and sustainability models
- EOSC Digital Innovation Hub (DIH)
- Training courses and material

(+early adopter programme)

Planning, engagement and capacity building

- Input to business model and procurement of minimal viable EOSC

- Cross-sectoral synergies between big business, SMEs and EOSC

- Digitally skilled, informed users of research data and tools, engaged providers
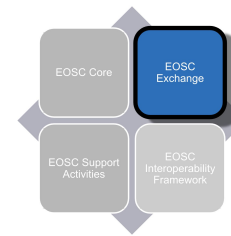
Relevant KERs

- Internal services in the Hub Portfolio
- EOSC Rules of Participation
- EOSC Service Management System
- EOSC Portal and the Marketplace
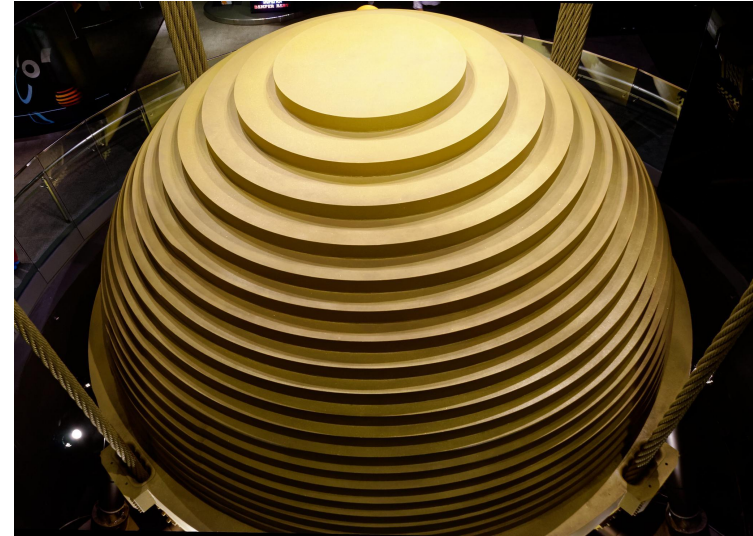
Robustness through definition of

- Federating services to ease integration and encourage use of standard approaches (building blocks)
- Actionable rules for onboarding services (compliance with policies)
- Secure and trustworthy federated execution environment (quality)
- Aggregation and uniform presentation (delivery channel)

Relevant KERs

- Services in the EOSC Service Portfolio

Competence centres

Validate the core, attract new users, providers

- **Increased cloud-based data exploitation**, easier access to tools and data (federated AAI), easier discovery of research data (horizontal and vertical services), common metadata

- **Impact:** contributions to SDGs, faster time to publications, faster tool and resource selection, common, systematic capture and use of common body of knowledge
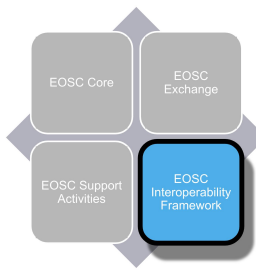
Relevant KER

- Interoperability and Integration Guidelines

Concrete role

- Architecture for basic EOSC technical functions
- Promoting EOSC standards and APIs.
- Facilitate access to services, lower barriers of entry, make services composable
- Encourage cross-pollination

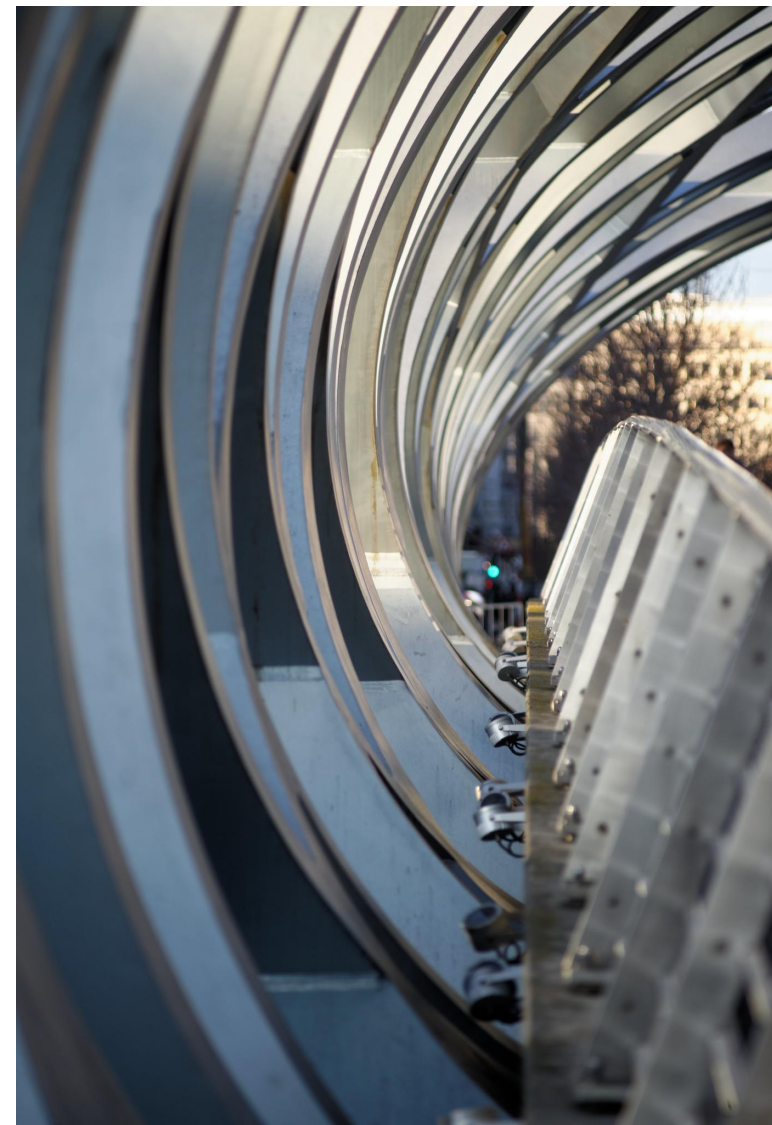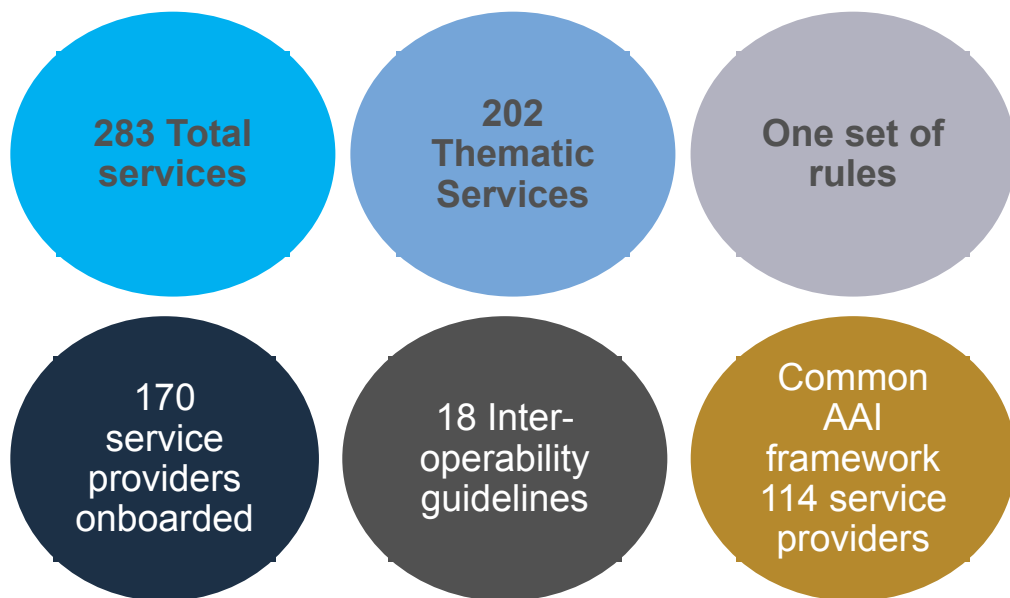## Impact: increase composability and avoid vendor lock-in

- Adapt once, use with many communities and use cases
- Reduce dependencies on specific implementations

Impact on science, economy and digital transformation

Optimised access to IT equipment and services

EOSC-hub

KER 1: EOSC Portal and Marketplace
KER 2: EOSC Service Management System (SMS)
KER 3: Rules of Participation (RoP)
KER 4: Internal Services in the Hub Portfolio
KER 5: Services in the EOSC Service Portfolio
KER 8: Interoperability and integration guidelines
KER 9: Training courses and material

283 Total services

202 Thematic Services

One set of rules

170 service providers onboarded

18 Inter-operability guidelines

Common AAI framework 114 service providers

From Achilles' heel to Atlas's shoulder

- **Federated AAI** take-up: paramount for combined use of federated data and services!
- **Common framework**
    - EGI **Check-in**, EUDAT **B2ACCESS**, INDIGO **IAM** and GEANT **eduTeams**

114 service providers using EGI/EUDAT AAI

- **280% growth** during the project lifetime (M39 status)

No hardware or software platform lock-in

KER 3: Rules of Participation (RoP)

KER 4: Internal Services in the Hub Portfolio

KER 5: Services in the EOSC Service Portfolio

KER 8: Interoperability and integration guidelines

Open by default, community-driven, transparent platform
- Encourage and support adopting common APIs and internal services
- Internal and portfolio Services: tools and incentives
  - Support and integrate legacy solutions
  - Avoid dependency on other legacy solutions

Stakeholders with increased freedom:
- **30 thematic services** integrated, 40 integrations with 19 different e-Infrastructure services
- **26 research communities**, **14** EAP services, **18** DIH pilots

Three services integrated to EOSC
- Virtual Language Observatory (VLO)
- Virtual Collection Registry (VCR)
- Language Resource Switchboard

Several EOSC-hub services integrated
- VLO: B2FIND, EGI Cloud
- VCR: open to third-party solutions
- Switchboard: B2DROP
- Open interfaces!

Growth
- VLO visits: **135%**
- VCR **collections: 40%**
- Number of Switchboard processing tools: **150%**

CLARIN
ERIC

Common Language Resources and
Technology Infrastructure

More scientific communities using infrastructures

KER 5: Services in the EOSC Service Portfolio

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

KER 9: Training courses and material

Competence centres, Early Adopter Programme

Growth through capacity and capability building

- Portfolio services bring in new communities
    - Directly (thematic service user communities)
    - Indirectly (EOSC Portal and other project engagement channels)
- Training and collection of material: first in-depth EOSC contact **and** exploitation path for communities
- Business and sustainability: managed growth

200 unique community contacts in ~100 distinct scientific disciplines ordered services

Success story - Increased uptake EGI Federation and EUDAT CDI

- EGI Federation HTC/HPC platform: 27% increase in computing workload
  - 2020 EGI user community increased from 70,900 to 75,400 registered users (+6% from 2019)
  - 22 major research cloud providers across Europe, +91% yearly increase of EGI Cloud utilization in 2020
- EUDAT infrastructure CDI: dramatic growth in key services from start of the project
  - B2SHARE file downloads: 147% growth
  - B2FIND searches: 120% growth
  - Number of registered users doubled during the second project period
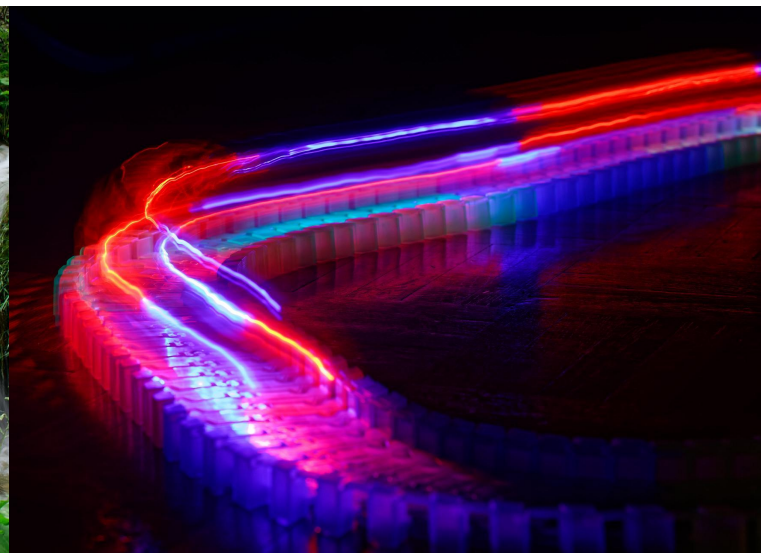
More people trained in research and academic sectors

 KER 9: Training courses and material

 KER 5: Services in the EOSC Service Portfolio

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

Competence centres

Core activity with multiple amplifiers

- **203 events**, over **5200 individual** participations, **350 training modules**
  - Train the trainers
- Thematic services: prosumer and amplifier
  - Bring thematic modules to EOSC, include EOSC in own programmes
- DIH: cross-sectoral, two-way link

Success story - Dynamic on Demand Analysis Service (DODAS)

Thematic service: exploit distributed, heterogeneous clouds to process, manipulate or generate data

- Any cloud provider, practically zero effort

Awareness raising:

- 8 training events to increase awareness, material in training registry
- School on Open Science Cloud track contributions

Growth: **four new large user communities** (baseline 1)

- High-Energy Physics, Astroparticle and Gravitational wave research

Establishment of partnerships with industrial & private partners

 KER 4: Internal Services in the Hub Portfolio

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

 KER 9: Training courses and material

Clear, visible contact point for collaboration

- Impact through EOSC-DIH
  - **18** pilots, **25** SMEs supported, **30** events
  - **4 new EOSC services**
- Focus on SME needs made possible by Internal Services and Training resources
- Seamless continuation after the project, momentum maintained

Cold-chain and logistics optimisation challenge

- Analyse historical data, extract patterns
  In transportation of perishable goods
- Identify malpractice and analyse
  real-time data
- Decision-support: routes, grouping of
  foodstuffs for transportation.

Deep Hybrid DataCloud: Jupyter instance in
the DEEP CLOUD (GPU)

- Faster model training

Socioeconomic benefits: save fuel,
avoid food waste

- Related to 37% of the total GHG emissions

Incentives for universal discovery & collaboration

EOSC-hub

- **KER 1:** EOSC Portal and Marketplace
- **KER 2:** EOSC Service Management System (SMS)
- **KER 3:** Rules of Participation (RoP)
- **KER 4:** Internal Services in the Hub Portfolio

- **KER 5:** Services in the EOSC Service Portfolio
- **KER 7:** Business and sustainability models for services and the hub

Competence centres

Cross-cutting priority of the project

- Bringing together several interdisciplinary/cross-border initiatives

Virtual Access, early adopter programme,..

- Provide the initial push for collaboration
- Users from **176 countries**

Long-term incentives: common rules, guidelines, vision, services and their management solution
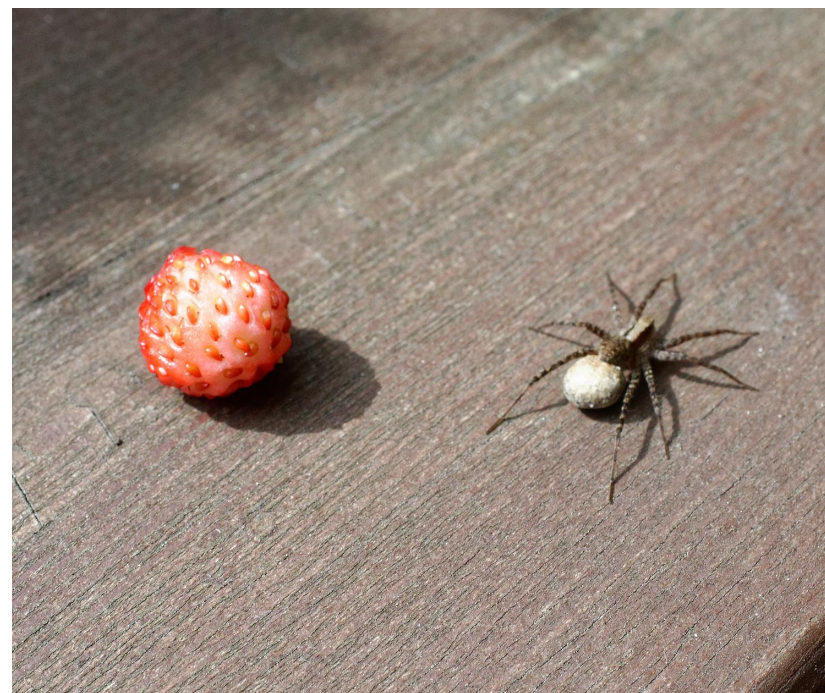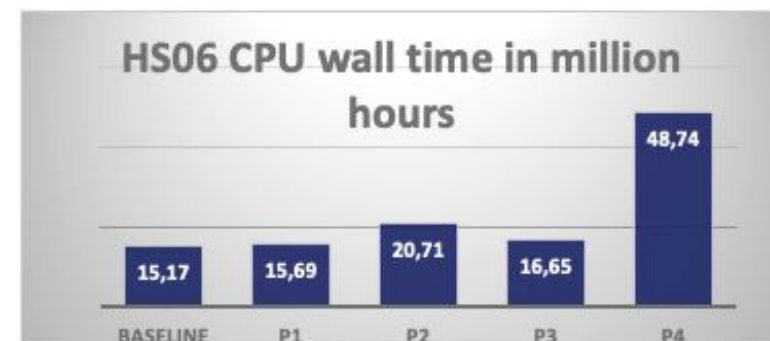
Worldwide e-Infrastructure for NMR and structural biology

The perfect tool for COVID-19 research

- Protein-protein interactions
- COVID-19 research: a third of the new use

Dramatic increase in use

- Over **9000** new users during the last **12 months**
- Users from **123 countries**

new user registrations

BASELINE 1750, P1 2273, P2 3844, P3 4356, P4 9206

HS06 CPU wall time in million hours

BASELINE 15,17, P1 15,69, P2 20,71, P3 16,65, P4 48,74

user submissions

BASELINE 13800, P1 36179, P2 24702, P3 26606, P4 74321

Strategic communications and engagement to boost impact

Community built around EOSC-hub

IMPACT

WP3's event registrations, newsletter, and social channels all cultivated a sizeable, and highly relevant community that were kept up-to-date on EOSC-hub's activities and results
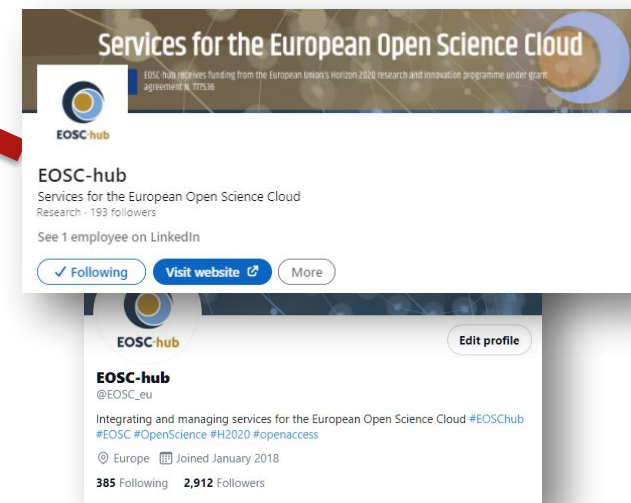
Cultivated up to an estimated

5362

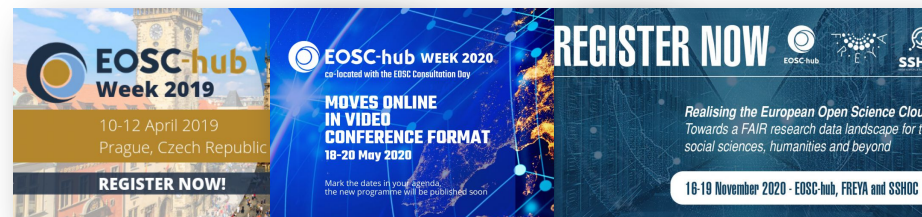**Engaged community members through multichannel engagement activities**

2,263
Mailing list Subscribers & flagship event attendees

**3099 +
Social Media
Followers**

# EOSC-hub Website is an established reference point on EOSC

Users ↓	New Users	Sessions	Bounce Rate	Pages/Ses...	Avg. Session Duration
32,757	32,478	60,463	44.88%	2.81	00:02:32

Visits

- 11430 (M6)
- 13739 (M12)
- 22795 (M18)
- 13377 (M24)
- 23781 (M30)
- 46501 (M36)
- 44372 (M39)

Main activities
- KER section finalised
- Training section revamped
- 68 news published
- 21 blogs published

Top viewed sections during 2nd period
- Flagship Events: 25k
- Training: 11.5k
- News: 10k
- Services: 8.4k
- Communities: 4k
- About: 3k
- Deliverables 1.9k

Users

■ Organic ■ Direct ■ Referral ■ Social Media ■ Email

35% / 16% / 44% / 4% / 1%
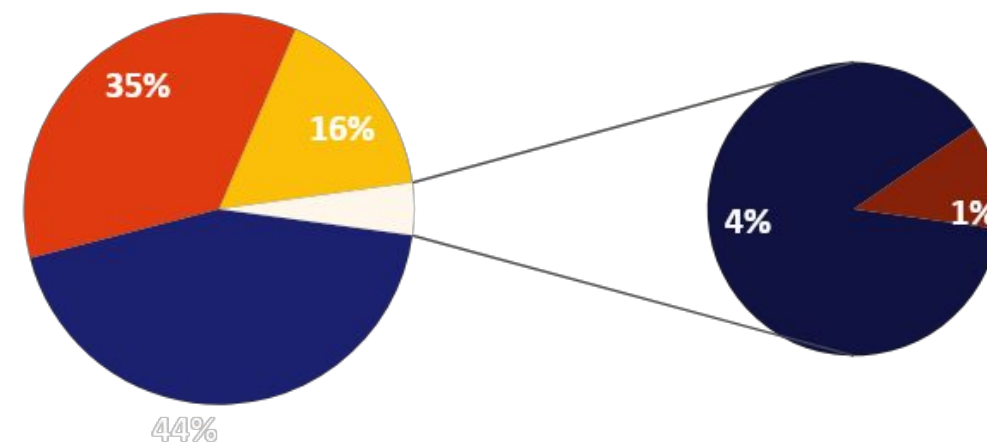
IMPACT

The website is the project's ultimate reference point online. It provides both technical and non-technical information and is organised allowing visitors to find results and outputs of the project in various areas.

Final period saw 32k users visit 60k times roughly viewing almost 3 pages for 2.5 mins per visit.

Training Catalogue Improved

Training Section was revamped with a more user-friendly experience through a guided approach

OLD

NEW

EOSC-hub training material formed the first training courses on the portal, until EOSC Enhance added their new tutorials

IMPACT
Since revamp (June 8 2020), bounce rate was reduced from 48.28% to 30% meaning an improvement in UX

Publications provide a portable overview of important results

IMPACT

One of the tools ensuring visibility in third-party events is publications. Even after the disappearance of on-site events, publications in their digital format provide a quick, portable, shareable overview of EOSC-hub's most significant results.

3 Booklets Produced
EAP, KER, DIH Success Stories

5 Flyers Produced
Data Management, Thematic Services, Competence Centres, EOSC Portal, 5 ways to work w/EOSC-hub

4 Magazine Issues Produced

Ensured visibility of consultations

Proposals for Common Services Specifications (446 Views)

Procurement & Business Models Consultation (65 Views)

Proposals for Federation Services Specifications (424 Views)

EOSC Technical Architecture Survey (190 Views)

Federating Core Governance and Sustainability Consultation (207 Views)

Cross-Border Services Consultation (236 Views)

More than 30 universities, e-infrastructures, research infrastructures and funders have provided input to surveys that helped developing the KERs

Business and sustainability models
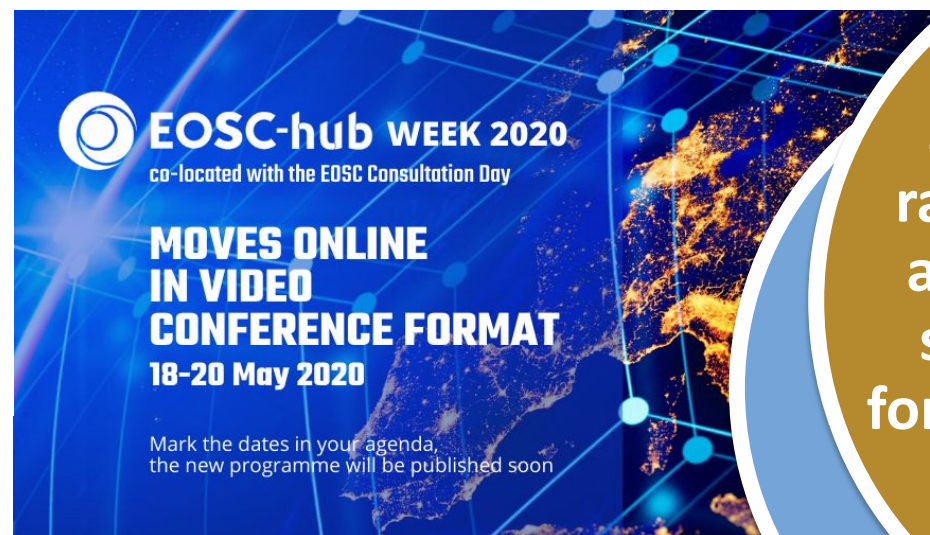
Interoperability and Integration Guidelines

Internal Services in the Hub

EOSC-hub Week 2020

HIGHLIGHTS

- **800** attendees - biggest EOSC-hub audience
- **31** total sessions held
- <u>Co-located with the EOSC Consultation Day</u> and 3 other EOSC events
- Live interactions facilitated through **slido** **ZOOM** Audience satisfaction high - **4.4-star rating**

EOSC-hub WEEK 2020
co-located with the EOSC Consultation Day

MOVES ONLINE IN VIDEO CONFERENCE FORMAT
18-20 May 2020

Mark the dates in your agenda,
the new programme will be published soon

IMPACT

Switching to virtual rather than cancelling allowed EOSC-hub to share its results and form stronger links with the EOSC governance

Events & Web Tools Highlight:
Realising the EOSC Conference

HIGHLIGHTS

- Introduced new event engagement activities such as virtual exhibitions & lounges and a virtual conference environment

- **690+** attendees from **45 countries** including 20 countries outside EU

- **30** total sessions, **33** exhibition booths

- Exhibition generated **3780+** Total Booth Visits, **880+** Video Views, **1520+** Document Views

- Audience satisfaction high - **4.5-star rating**

- All exhibition materials, session recordings etc are accessible on the EOSC-hub website

IMPACT
EOSC-hub provided an opportunity for the EOSC community to showcase results & generate new connections

4.1⭐
EOSC-hub Week 2019 Rating

4.4⭐
EOSC-hub Week 2020 Rating

4.5⭐
Realising the EOSC 2020 Rating

Supporting the EOSC Early Adopter Programme

Announced during the EOSC-hub Week 2019 plenary

ACTIVITIES & RESULTS

Posted strategic social messages (i.e. 1, 2, 3)

10k+ Social message impressions
3720+ total slide views
1412 EAP page views
300+ EOSC-hub Week attendees
282 form views

30 Webinar attendees
18 slide downloads

27 Applications Received
(**13** selected)

IMPACT
Effective promotion through comms & events allowed the EAP to obtain 2x the amount of applications needed

EAP main page & form

Webinar organised on 29 Mar 2019

Project Closure & Communicating the Legacy

KER web section

Final legacy video

Final KER-based campaign activities

- Press release distributed to media
- KER booklet published
- Video showcasing KERs produced: https://www.youtube.com/watch?v=h-hqb2sU5r4
- Webinars showcasing results made available on-demand
- Feature article in the final magazine issue

IMPACT

EOSC-hub's website is designed to direct future visitors and the continuing EOSC players to EOSC-hub's most relevant results. This is further amplified through a KER-based final set of communication activities. (see eosc-hub.eu/results)

Project Closure & Communicating the Legacy

Media Coverage
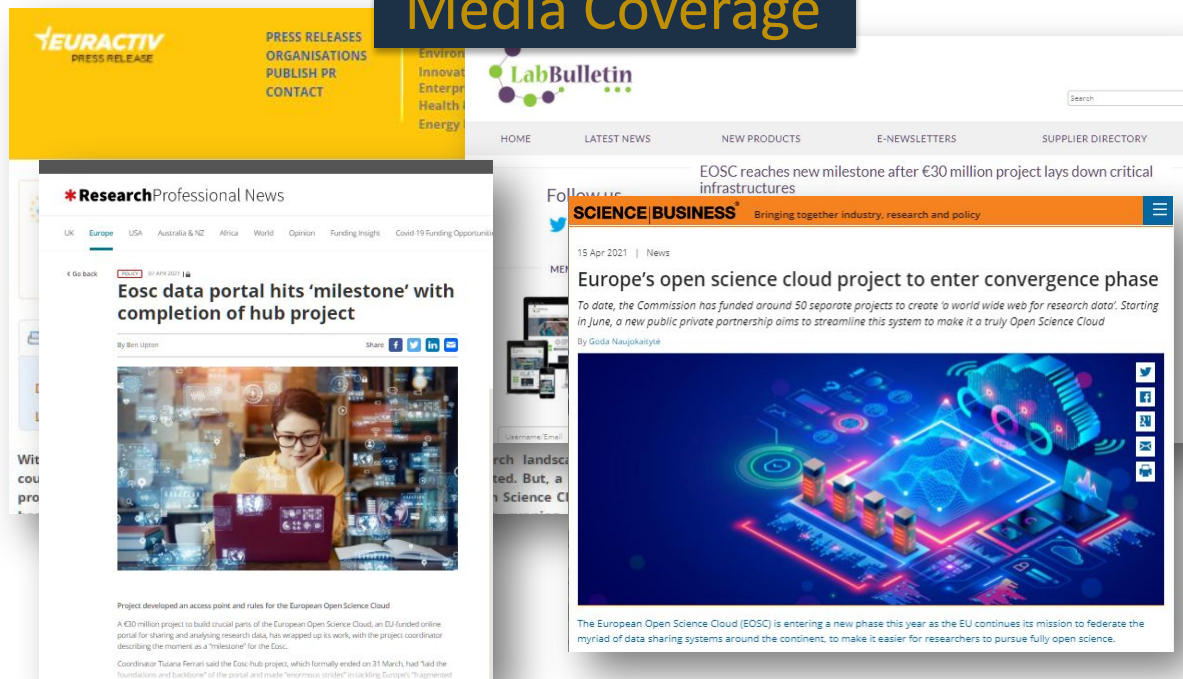
Press Campaign Highlights

- Message is EOSC-hub's significant contribution to EOSC development
- Mainstream media interest on results generated
- Media inquiries/interview requests received

IMPACT

A final press release was distributed to showcase the results to media outlets that have NOT covered the EOSC-hub in the past. The PR has seen uptake from mainstream and sector-specific media and even generated media inquiries for interviews

- Communication and engagement have contributed to the success of the project and both the development and uptake of results
- In a closely-interlinked and co-dependent environment like EOSC, it is necessary to understand all the players and keep and involve them as part of your community.

Moving forward:
- EOSC-hub's website and knowledge hub - up for at least two years
- Final KER campaign crystallised EOSC-hub's legacy
- Handover of EOSC-hub's responsibilities on the EOSC Portal i.e. (continuous improvement, analytics, content production, social media) has been handed over to EOSC Enhance and EOSC Future

Vision

Researchers from all disciplines have **easy, integrated and open access** to the **advanced digital services**, scientific instruments, data, knowledge and **expertise** they need

to **collaborate** to achieve excellence in science, research and innovation

EOSC-hub

Mission

The EOSC-hub project **mobilises providers** of European relevance offering **services, software and data for advanced data-driven research and innovation.**

These resources are offered via the Hub – the **integration and management system of the European Open Science Cloud**, acting as a European-level entry point for **all stakeholders.**

Summary of EOSC-hub contributions

EOSC-hub was the first major implementation project of the **EOSC Core**. It contributed to **EOSC supply side** through
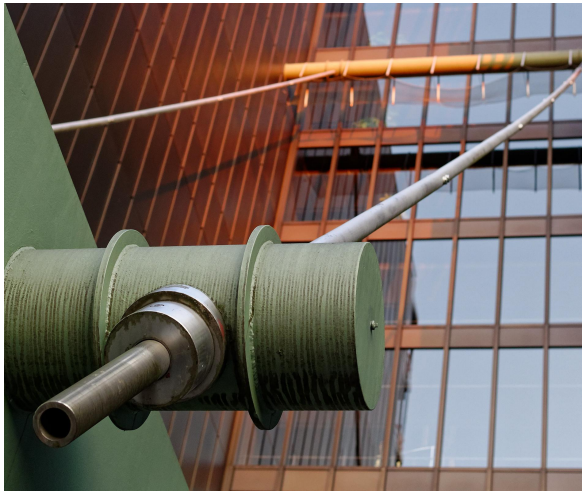
- **Technical architecture**
- **Interoperability standards**
- Functional definition of the **Minimum Viable EOSC**
- **Rules of Participation**
- Creation of the **EOSC Exchange** portfolio: e-Infrastructures and research infrastructures services and data
- Creation of the **EOSC Core**: EOSC Portal, federated AAI and PID services, accounting, monitoring and the helpdesk

EOSC demand side was an equally important focus area, resulting in strong networks:

- **Research communities**
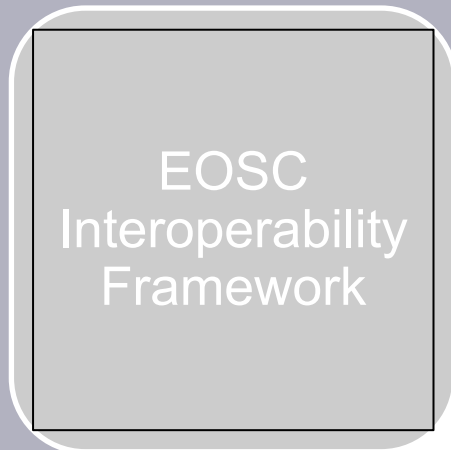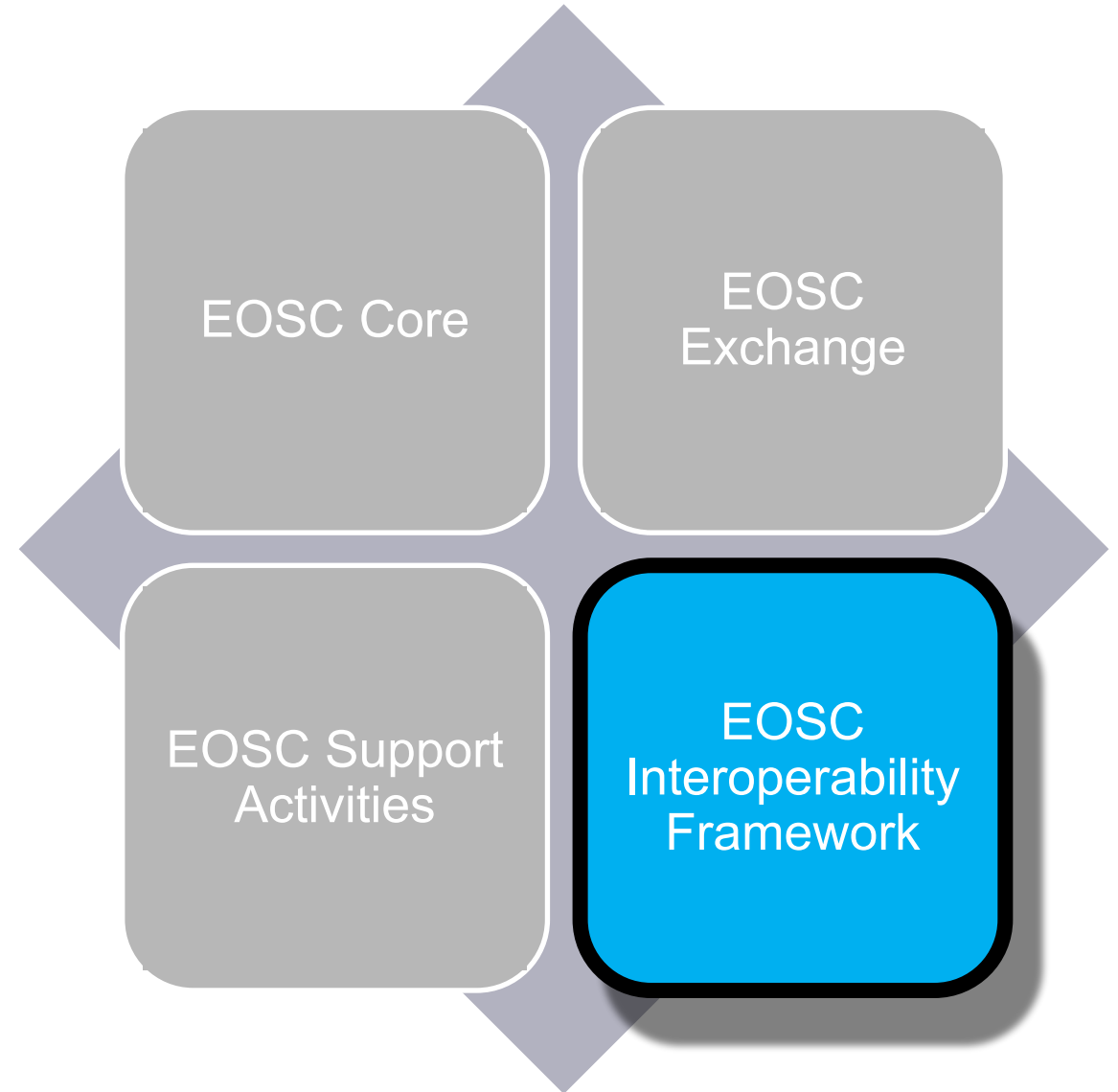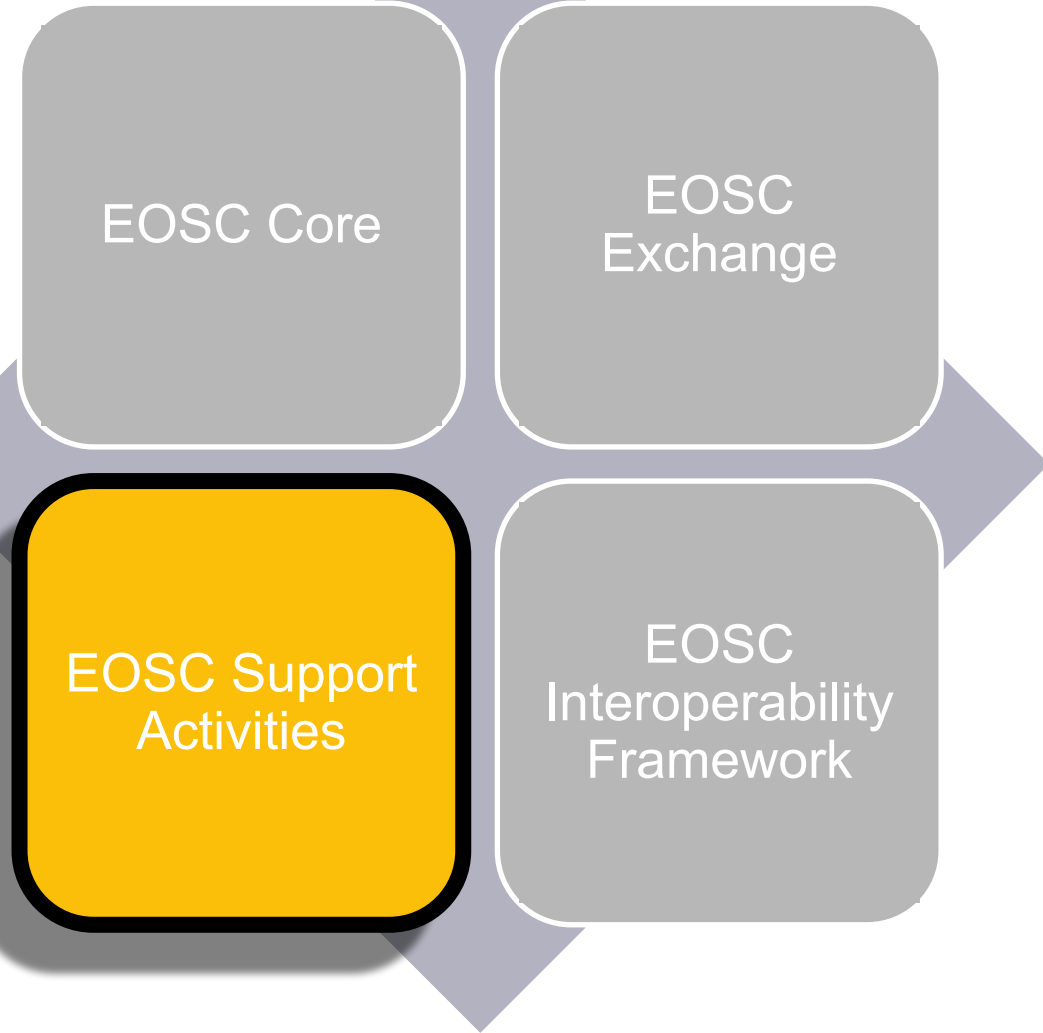- **Industry** and
- **SMEs**.

Thank you
for your attention!

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Questions?

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Abstract impact - creation of a shared ecosystem

Synergies through common reference, governance, operational models

Optimised access to IT equipment and services

KER 1: EOSC Portal and Marketplace
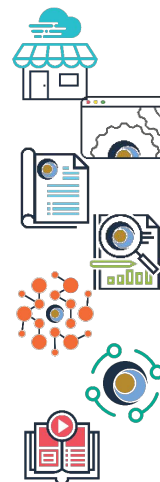**KER 2:** EOSC Service Management System (SMS)
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KER 5: Services in the EOSC Service Portfolio
KER 8: Interoperability and integration guidelines
KER 9: Training courses and material

- One marketplace, management system, rule set; **284** horizontal and thematic services
- RoP and SMS: **Trust** fitness for purpose, predictability
- KERs together reduce **friction** and **risk** of EOSC integration (for users and providers)