



**EUROPEAN OPEN
SCIENCE CLOUD**



EOSC Symposium 2019

Where the EOSC makers & shakers meet

HIGHLIGHTS

Budapest, 26-28 Nov. 2019



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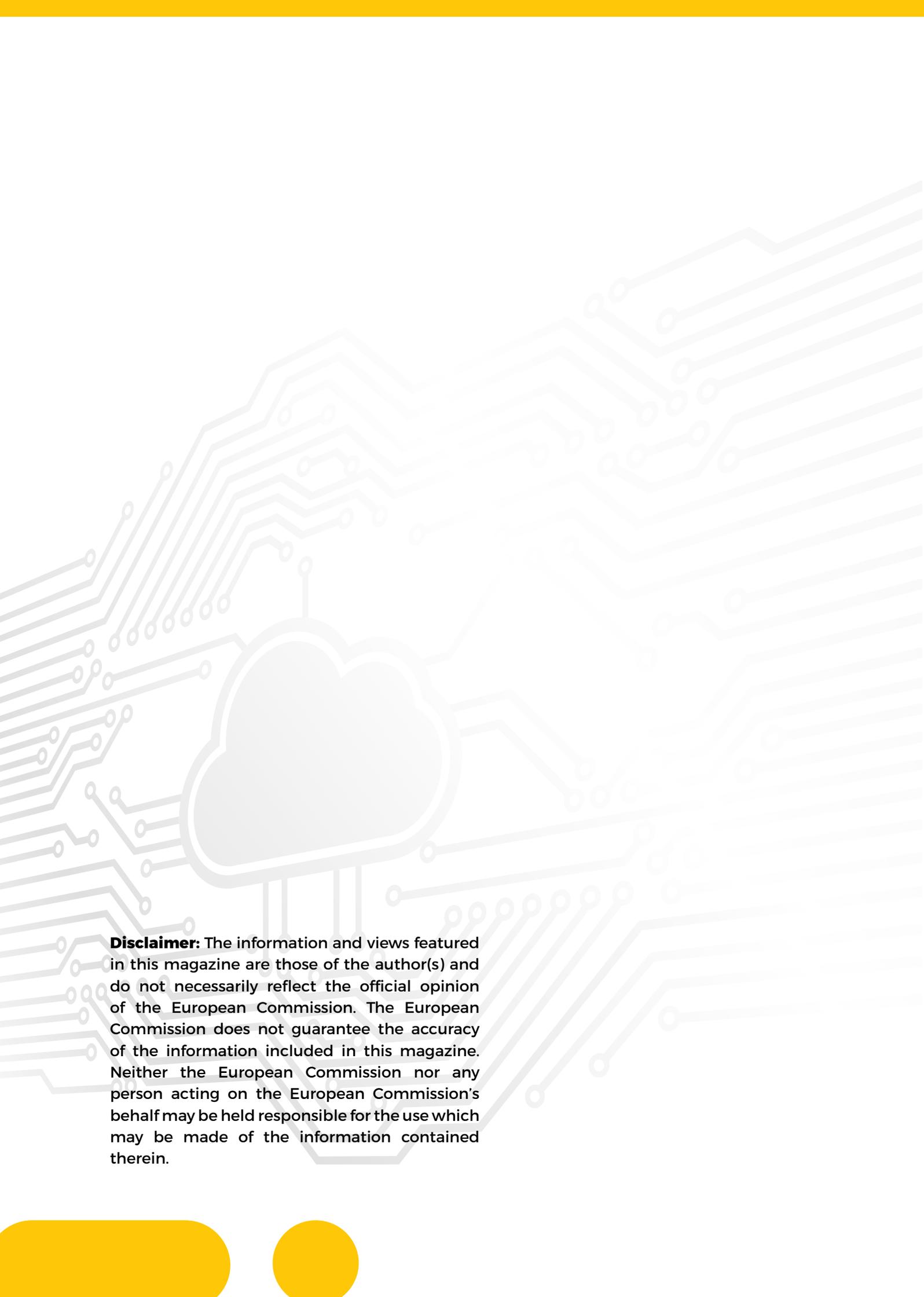
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In memory of Dr Lajos Bálint (1946-2019),
Hungarian Governmental Informatics
Development Agency (KIFÜ) and EOSC
Sustainability WG Member.



European Open Science Cloud: A Game-Changer in Research

Europe's leading research institutions met at the EOSC Symposium in Budapest to take stock of the progress of EOSC

The EOSC Symposium, one of the largest European Open Science Cloud events, was held in late November 2019 in Budapest and was the perfect opportunity for stakeholders to discuss the implementation of EOSC. The event was co-organized by the EOSC Secretariat and other initiatives such as EOSC-hub, GEANT, OpenAIRE and PRACE in collaboration with the EOSC Governance Board, Executive Board and its Working Groups.

EOSC will empower 1.7 million European researchers, and 70 million professionals in science and technology, through a system based on cooperation and connecting European research infrastructures and e-infrastructures. Ron Dekker, EOSC Executive Board Member and CESSDA ERIC Director comments that “EOSC will enable interdisciplinary research and address Europe’s societal challenges and stimulate the emergence of a competitive EU cloud sector.” EOSC represents a key aspect of the EU Digital Single Market in terms of putting Europe’s digital assets at the disposal of scientists.

Ivan Maric, EOSC Governance Board Croatia Delegate and Deputy Director & CTO at SRCE - University of Zagreb University Computing Centre, added that EOSC is a trusted and open virtual environment for the scientific community, with seamless access to services addressing the whole research lifecycle. “Focused on researchers needs, inclusive and respectful of diversity, accessible to all, transparent and trustworthy, and governed by a minimal set of Rules of Participation, it represents a unique European game changer.”

The vision of EOSC was conceived in 2015, and a prototype was officially launched in November 2018, with access to initial services via the EOSC Portal. This first iteration of EOSC aggregates services from local, regional and national e-Infrastructures and service providers. For researchers, this means a broader access to services supporting their scientific discovery and collaboration across disciplinary and

geographical boundaries.

“The establishment of the data cloud also provides space for innovation,” István Szabó, Vice President for Innovation and General Affairs of the Hungarian National Research Development and Innovation Office (NKFIH), added. “Researchers will provide their data and publications, and innovators will think about how to use them to address societal challenges.”

“EOSC is built in iterations.” stressed Dekker, “From involving the research communities to ensure an ecosystem built by the users, for the users, and based on FAIR (Findable, Accessible, Interoperable and Reusable) data principles. This doesn’t simply mean developing a tool or a software, but enacting a cultural change in how research is produced.”

Building the EOSC requires Europe’s research institutions and infrastructures to come together and collaborate. This has been going on since 2017, and it becomes even more critical as we move towards its completion in 2020.



Ivan Maric, Ron Dekker, István SZABÓ at the EOSC Press Conference

Day 1

Opening Plenary

Chair: Ivan Maric, SRCE - University of Zagreb & EOSC GB Croatian delegate

Budapest was chosen to host the EOSC Symposium because Central and Eastern Europe have been increasingly involved and active in open science efforts in recent years. Organising the Symposium in the region was an encouragement for this trend to continue.

Dr. István Szabó, Vice President for Innovation and General Affairs of the Hungarian National Research Development and Innovation Office (NKFIH) stressed the many steps that Hungary has taken towards open access in science; “We have supported EOSC since the beginning. We expect Hungarian researchers to be more embedded internationally” he concluded.

“By federating services and data, EOSC will revolutionise the way that research is done. EOSC needs to be attractive, and its attractiveness is based on its content, on the data and services. If it is attractive for scientists, it will succeed,” added

Ivan Maric, EOSC Governance Board Croatia Delegate and Deputy Director & CTO at SRCE - University of Zagreb University Computing Centre.

According to Jean-François Abramatic, INRIA & EOSC Executive Board Member, and former W3C Chairman, “EOSC is trying to move from Gutenberg science to Berners-Lee science, from publications to sharing,” The biggest challenges lie in the heterogeneity of contents, the scale of the operation, and its sustainability, he continued, “but we are not starting from scratch.”

“Global open science is a driver for enabling a new paradigm of transparent, data-driven science as well as accelerating innovation,” Zoe Cournia from the Biomedical Research Foundation at the Academy of Athens concluded.

[Click here for the presentations from this session.](#)

Breakout Session 1

Action towards FAIR in practice

Chair: Sarah Jones, Digital Curation Centre, EOSC EB & FAIR WG Chair; Liisi Lembinen, University of Tartu Library & EOSC FAIR WG; Ilona von Stein, DANS; & Angus Whyte, Digital Curation Centre Related EOSC WGs: FAIR

The FAIR WG, is made up of 30 members and 4 task forces. It is currently working on persistent identifier policy, metrics for FAIR data and repository certification, as well as the EOSC interoperability framework together with Architecture and Rules of Participation WGs. The FAIRsFAIR project supplies practical solutions for the use of FAIR data principles throughout the research data lifecycle, fostering FAIR data culture and the uptake of good practices.

A series of lightning talks provided useful insights for researchers, with the aim of

turning recommendations into practice, while highlighting several of the most common difficulties encountered in the implementation



of FAIR data principles, such as the generally low knowledge about them, or the lack of will to share data.

To tackle these challenges participants commented that incentives and rewards should be introduced as the process is often costly and time-consuming. Further suggestions included

an improved structure for Research Evaluation, and the promotion of supporting staff such as Data Stewards. Finally, success stories on sharing research data will be collected and presented at the next EOSC Symposium in 2020.

[Click here for the presentations from this session.](#)

Legal status of EOSC

Chair: Rupert Lüeck, EMBL, EOSC EB & Sustainability WG Chair; Jan Hrušák, Czech Academy of Sciences, ESFRI, EOSC EB & Landscape WG Chair

Related EOSC WGs: Sustainability, Landscape

The first Strawman version of the EOSC Sustainability plan was published two months ago with the topic of the legal status of EOSC a key part. Both the Landscape and Sustainability WGs have been working on areas related to this topic and outputs were covered in the session.

To date, the Landscape WG has carried out a stock taking exercise on existing Research Infrastructures that are ready to contribute to the EOSC. This will be synthesized and analysed in order to produce a statement about the readiness of member states to participate in the EOSC.

Future sustainability plans post 2020 have been the focus of the Sustainability WG covering business and funding models, responsibilities and legal entities. It is clear that a thorough risk analysis is also required for different areas of the EOSC and it is important to understand that different business models are required given the broad scope of the EOSC. In addition, interaction with EuroHPC is also important. The added value of EOSC also needs to be shown clearly, in particular to researchers and service providers in the infrastructure space.

A Tinman report from the EOSC Sustainability Working Group after the Symposium which includes consideration on the legal framework as part of a set of requirements for the sustainability

of the EOSC. This highlights that the EOSC as a legal entity is not the same as the future EOSC- ecosystem. This Legal Entity, in addition to operating various parts of EOSC technical infrastructure, will have as an important task to establish the future ESOC association which will have a major role in driving the future of EOSC ecosystem. The legal entity will thus be involved in governing, developing, sustaining and communicating EOSC.



Rupert Lüeck, EOSC Sustainability WG Chair

HPC & EOSC

Chair: Debora Testi, CINECA & PRACE

This session aimed to set the basic elements for definition of the best strategy for the collaboration between HPC and EOSC stakeholders in the provisioning of computational resources. Common ingredients across many of these presentations mentioned the wish to provide faster and more efficient access to HPC resources.

There was a clear agreement at the session that service portfolios will have to be flexible to new user requirements. The participants also pointed out that there will still need to be an element where some services are of a “turnkey” nature; especially when users are fairly new to HPC usage. Key overlaps

between EOSC and EuroHPC were identified in data moving, storage, and Authentication and Authorisation Infrastructure (AAI).

There will be a lot of organisational challenges and policy challenges for resource allocation, and it is important to understand how to enable the best possible access to the best science. The panel felt that EuroHPC rules were at an early stage, but that clearly policy elements could be shared across EOSC/EuroHPC around resource allocation where appropriate.

[Click here for the presentations from this session.](#)



Town hall meeting on the EOSC Architecture

*Chair: Jean-François Abramatic, INFRIA, EOSC EB & Architecture WG Chair
Related EOSC WG: Architecture*

The town hall meeting on EOSC Architecture saw WG members meet stakeholders. Feedback was gathered on the activities of the WG, its Task Forces and the way forward. The topics identified on this occasion will be analysed to see if new teams should be set up. Apart from questions about FAIR services and infrastructures, many participants also highlighted the concepts

of product management and the collection of information and use cases. In addition, the proposal of a top down approach for the vision and scope will be discussed in the next EOSC Architecture WG meetings. The participants agreed that the meeting was fruitful and would like to repeat it at the next Symposium.

[Click here for the presentations from this session.](#)

Breakout Session 2

PID Policies

Chairs: Rachael Kotarski, The British Library & FAIR WG; Tobias Weigel, DKRZ & Architecture WG
Related EOSC WGs: Architecture, FAIR

A Personal Identifier (PID) policy for EOSC is essential for trusted connections between systems in the EOSC. Scientists will only use EOSC if they trust the services with their data.

The importance of continued collaboration between the FAIR and Architecture WGs was stressed by participants at the PID Policies breakout. Identification is needed to improve workflows and to be FAIR, PIDs have different stages in their lifecycle, and PID Policy needs a clarification of persistency of identifiers versus

the object, a support to complex granularity joint with metadata for automation. PID has to be designed for machines and humans, and it can be generic and discipline-specific. It has to guarantee that news systems and practices will be accepted, as there is the need of a common understanding about the assignment of PIDs to digital objects, and there are cases where some sets of metadata have to be extracted and linked to PIDs in order to accelerate the answer.

[Click here for the presentations from this session.](#)

Service Onboarding

Chair: Juan Bicarregui, STFC, RDA, EOSC EB and Rules of Participation (RoP) WG Chair
Related EOSC WG: RoP

The EOSC Rules of Participation WG is currently working on a first set of minimal rules of participation defining the rights, obligations and accountability of stakeholders by 2019 upon which consultations will be done. Based on this, a finalised Rules of Participation will be released by the end of 2020. The importance of testing and validation was emphasised by Archiver, OCRE and OpenAIRE as part of their service onboarding process.

A clear process for service onboarding is already being implemented in a pilot form through the EOSC Portal based on some light

“rules of participation”. A standardised Service Onboarding Template is vital to receive the same type of information for services being onboarded. Participants also mentioned the important distinction between service portfolio, which is an aggregation from various service providers, and the service catalogue, which is the access point for users.

In conclusion, a process is needed to ensure that service providers are not asked to provide information multiple times. Automation of service publication is being explored by EOSC-Nordic and EOSC-hub to reduce human error, as it is expected that hundreds of services may be uploaded to the EOSC-hub in the future. An automation approach will lower the overhead for service onboarding.

[Click here for the presentations from this session.](#)



Business Models for EOSC

*Chair: Rupert Lüeck, EMBL, EOSC EB & Sustainability WG Chair
Related EOSC WG: Sustainability*

Participants identified several key challenges in the realisation of the best business models for EOSC. Firstly, there is a need to detail the contents of the federating core, and the Architecture WG is approaching the question as a set of specifications rather than of individual service instances. In addition, it is fundamental to align vocabularies, with the definition of a common glossary across projects and Working Groups.

It was highlighted that services are never policy-free, impacting their access and consequently how they are positioned in digital marketplaces. It was suggested to consider GÉANT open exchange points as an example. Possible means of combining voucher schemes with the EC Virtual Access funding mechanism

should be investigated, in order to remunerate publicly-funded service providers. It would also be advantageous for users to be able to use a voucher to access services from multiple providers.

The trade-off between openness of access and funding was also raised with different views between researchers and service providers. When considering how to develop digital marketplaces for the private sector in future iterations, business models will require further investigation. The output of the discussion will be used as input for the preparation of the forthcoming 'tinman' version of the Solutions for a Sustainable EOSC document.

[Click here for the presentations from this session.](#)

FAIR Metrics

*Chairs: Anusuriya Devaraju, MARUM; Edit Herczog, Values & Vision Srl;
Mustapha Mokrane, DANS; Konstantinos Repanas, European Commission
Related EOSC WGs: Architecture, FAIR, RoP*

FAIR metrics are becoming a priority and this session provided a precious opportunity to discuss what metrics we want, and what approach is being adopted by multiple stakeholders. FAIR data assessment is currently at the requirements phase, as explained by Anusuriya Devaraju, and is based on the 13 data FAIRness assessment metrics which were built upon existing work. The main focus is on gathering feedback from pilots, so as to improve and extend these metrics.

During the panel, Eleni Toli from NI4OS stressed that there is also a need to distinguish open from FAIR, from a legal perspective as well. David Carr, Wellcome Trust added as that a funder, Wellcome Trust encourages researchers

to adopt FAIR principles as a gold standard for data, although there is no commonly agreed process to assess the extent of this FAIRness. Indeed, funders should work together to align expectations and develop a consensus in this area.

Manual assessment of FAIR data can be used to raise awareness on FAIR or self-monitoring/improvement, but this is unlikely to be sustainable and may face scalability problems. Rather, automatic assessment will likely be the way to address scalability issues. FAIR criteria and indicators should be inclusive and take into account community requirements.

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Plenary 2 – EOSC Use Cases

Chair: Matej Ďurčo, Austrian Centre for Digital Humanities

Although EOSC will be fully launched next year, there are already many projects benefiting from the initiative; seven of them were presented in this session. OPENCoasts, presented by Alberto Azevedo, is a service that builds on-demand circulation forecast systems for different users. EOSC-Hub provided the necessary resources and tools to expand the service. Serena Battaglia, Capacity Program Manager at ECRIN, argued that studies and data objects in clinical research are often scattered around. They are working on a repository allowing their identification, facilitated by EOSC's hardware resources.

Maria Eskevich from CLARIN-ERIC suggested that all digital language resources and tools should be available. Languages are social and cultural data, but they are complex to interpret and require specific software and tools. CLARIN offers several services through EOSC-hub and the EOSC Marketplace. Enol Fernández, Cloud Technologist at EGI Foundation, talked about AGINFRA+, a project that aims to use

core e-infrastructures to provide a sustainable channel for user communities about agriculture and food. EOSC provides access to more data and its cloud storage.

Regina Kwee from DKRZ introduced the ENES Climate Analytics Service (ECAS), that enables scientific end-users to perform data analysis experiments on large volumes of research data. For ECAS, EOSC will bring new market opportunities to the climate services context. Providing data about the climate is the focus of the Copernicus Climate Change Service as well, presented by Joan Sala Calero. Its objective is to apply FAIR principles to metadata, as well as quality control on all data provided to users, while EOSC-Hub offers a scalable computing infrastructure. Lennert Schepers from the Flanders Marine Institute (VLIZ) introduced Blue-Cloud, a thematic EOSC cloud addressing the potential of cloud-based open science for ocean research, through a set of five pilot demonstrators.

[Click here for the presentations from this session.](#)

Day 2

Plenary 3 – EOSC Rules of Participation

Chair: Juan Bicarregui, STFC, RDA, EOSC EB and RoP WG Chair

The definition and implementation of a set of rules for different actors was at the centre of the presentation by Michel Schouppe, in order to bring transparency on the rights, obligations and accountability of the data producers, service providers, and users. This was also stressed by Juan Bicarregui RoP WG chair, who introduced a first discussion document focussing on these rules and an intended timeline of activities. Participants were asked to comment on the document which was published in a shared document. A final release is planned at the end of 2020 with iterations published prior to that.

Different aspects were taken into account over the course of the session, concerning authentication and authorization, the establishment of an EOSC legal entity, considerations about allowing the inclusion of non-European providers and users. Participants shared many relevant suggestions and requests, such as a dedicated session for interested private sector actors, or the idea of a “maturity” scheme in which entities could gradually reach the desired EOSC readiness level.

The importance of engagement with industry was raised by Bob Jones, CERN. A survey of 100 researchers by the OCRE project highlights that researchers are using commercial cloud services in their everyday lives for simple tasks such as data sharing and storage, without too much red tape. As procurement of these services is difficult, researchers bypass IT departments to use them resulting in a reduction of reuse of data and research assets. To address this, the

EOSC RoP should to provide a level playing field and be inclusive of commercial providers so that they can continue to innovate in the EOSC. They should also be included in related data management plans. Equally, commercial providers need to understand the ROI for them.

The feedback received on this occasion will be fundamental for the future efforts of the Rules of Participation WG. An open call for suggested topics by the public prior to next year’s Symposium may help shape the agenda.

[Click here for the presentations from this session.](#)



Michel Schouppe, European Commission, Directorate General Research & Innovation (DG RTD)

Breakout Session 3

Impact of Requirements of FAIR on Technical Architecture

*Chair: Jean-François Abramatic, INFRIA, EOSC EB & Architecture WG Chair
Related EOSC WGs: Architecture, FAIR*

The session revolved around some major tasks for EOSC including the offering of generic cross-discipline services, consolidating e-infrastructures, and providing sustainability for services and data.

Diego Scardaci, EGI presented the EOSC-hub technical architecture. The project has created a set of interoperability guidelines to allow service providers to integrate with EOSC-hub services (e.g. helpdesk). These can be included in their offer to the users.

Jessica Parland von Essen, CSC presented the

EC-project FAIRsFAIR. She highlighted the importance of solutions that are user friendly, context sensitive and transparent to the users. Celia Alvarez Romero, FAIR4Health underlined the importance of FAIRification of data for health and biomedical research. The two-year project, which starts in December 2019, will implement a workflow for FAIRification based on FHIR. The semantics solutions presented by FAIRsFAIR will be described in a report to be analysed by the Architecture WG.

[Click here for the presentations from this session.](#)

EOSC Key Exploitable Results

Chair: Tiziana Ferrari, EGI; Paolo Manghi, CNR-ISTI & Architecture WG

Common categories and rules for processes, quality and governance are a vital part of the EOSC and need to be identified. This was a key message that resounded in discussion in this session. Pauli Assinen, Head of Development at the University of Helsinki, raised the point that it is important to understand how users can discover and access services. As many researchers don't know about EOSC yet, local support would be needed to reach out to them.

From the point of view of service providers, EOSC brings together infrastructures and important players in the field. However, "if we want to make it an exciting adventure to join EOSC, then big resources, high computing power to process data should be available for the users," Dick Schaap, MARIS said. At the same time, the EOSC Portal should ensure high quality, and quality verification should also be governed. Sy Holsinger, EGI Foundation argued for the need to adopt a common service management framework, which will help in the adoption of a terminology

Tiziana Ferrari, EOSC-hub;

that makes discussion much more effective.

Ilona von Stein, DANS highlighted the FAIRsFAIR project that supports a certification system for repositories which helps keep data FAIR. This



clearly boosts trust, and the consortium is already working on the evaluation and certification of individual data sets. Nevertheless, FAIR criteria should not be top-down and defined by bureaucrats, added Edit Herczog, Vision & Values

SPRL. Rather, “everyone should be part of it”. Feedback should be gathered, and a consensus should define these criteria.

[Click here for the presentations from this session.](#)



Diego Scardaci, EOSC-hub, Frauke Leitner, Euro-Biolmaging

FAIR Service Certification

*Chair: Françoise Genova, CNRS & FAIR WG
Related EOSC WGs: Architecture, FAIR, RoP*

Participants discussed evaluation in EOSC Nordic and measuring FAIRness. Automated processes were discussed and the premise that one or two files could represent the FAIRness of a repository. Special attention should be directed to “old datafiles” in repositories, and a self-assessment in combination with automated processes would be helpful. Focus should be on repositories, and certification may be sought to include other elements of the data life cycle (like PID systems, Registries, Vocabularies, Software that produces DMP’s, etc.)

In addition to FAIR principles, Owen Appleton, EGI introduced the definition of SHARP, which should be applied to services: Sustainable, Helpful, Accessible, Reusable, Professional. These concepts need to be further developed and integrated with FAIR.

In order to dive deeper into some of these topics, the FAIR WG will seek to organise a workshop on the topics discussed during the meeting.

[Click here for the presentations from this session.](#)

Skills development for EOSC – Competences

Chair: Natalia Manola, OpenAIRE, ATHENA R&I & EOSC EB

This session emphasised the need to work on building competence (skills) and capabilities (training) for EOSC as well as to provide a framework for a sustainable training infrastructure to support EOSC in all its phases and ensure its uptake. Therefore, the EOSC EB will launch a new WG dedicated to Skills and Training. This will be split into two parts: the skills development framework (competences) and the training framework/infrastructure (capabilities). EOSC-hub is in the process of restructuring the training section on their website to display modules for main audiences.

Participants also discussed OpenAIRE that has developed some services use cases and is reviewing the open science training landscape in life sciences in Greece. The plan is to create a case study for open access to publications, workforce and motivation.

Research libraries are also acting as a key stakeholder in enabling training and skills development for Open Science, as they are an essential link between universities and researchers. Lennart Stoy, EUA presented an analysis of the statistics gathered among higher education institutions about their strategy to address data literacy and skills, and the gaps that were identified will be covered in collaboration with FAIRsFAIR.

[Click here for the presentations from this session.](#)



Natalia Manola, EOSC Executive Board



Lennart Stoy, EUA

Breakout Session 4

Training infrastructure for EOSC - Delivery

Chair: Natalia Manola, OpenAIRE, ATHENA R&I & EOSC EB

With the launch by the EOSC Executive Board of a new Working Group on the topic of skills and training in 2020, this session was an essential step in gathering stakeholder input on the focus and scope of the WG.

The session put things in perspective by answering questions such as: “What is the EOSC?”, “What skills do we need for it to be useful?”, “What kind of training are needed in order to enable us to make best use of the EOSC?”

Mateusz Kuzak, eScience Centre, introduced TeSS, the ELIXIR training portal. He stressed the need to have a one stop shop for training events and materials. He also reminded participants that use cases are key in terms of identifying common terminologies or glossary for the EOSC.

This would be an essential part of any EOSC-related training materials.

The FAIRsFAIR project intends to address this by bringing best practices together from a range of domains, in order to provide a virtual competence centre that will become the main point of reference regarding FAIR, providing guidance and data curation.

Participants also identified a set of selection criteria to use for an EOSC training catalogue: Value by users (#1), Quality of materials (#2), Up to date content / timeliness (#3), Social considerations (#4), Provision by national projects (#5), Media considerations (#6), Provision by EOSC projects (#7), and Other (#8).

[Click here for the presentations from this session.](#)

Authentication and Authorisation Infrastructure (AAI)

*Chair: Leif Johansson, Swedish Research Council, Architecture WG; & Klaas Wierenga, GÉANT & Architecture WG
Related EOSC WG: Architecture*

The discussion touched upon the vision for AAI, with a streamlined organisation of services featuring seamless access to them. User experience must be at the core, also building on existing community relationships. Service and identity of providers must be separate (AARC BPA model). A particularly relevant principle is that users and services should be required to register just once, not in every infrastructure separately, as a mesh of interconnected infrastructure AAls

allows everyone to be part of EOSC.

The AARC Engagement Group for Infrastructures (AEGIS) brings together representatives from research and e-infrastructures from Europe and beyond and is seen as a key actor in this topic.

In the AAI architecture, a layer called LifeScienceID (layer) is integrated. This allows services to authorise users based on their ID.

[Click here for the agenda of this session.](#)

Open Science Policies in the context of EOSC - Networking is key!

Chair: Emma Lazzeri, CNR-ISTI

The aim of EOSC is to make the complex world easier for researchers, but one size does not fit all, as the participants of this breakout session emphasized. Networking is key in policy making. It is key to understanding and learning from user experiences, sharing and aligning practices, and raising awareness of barriers. Discussion also focussed on the need to understand communities and practices and to understand what open data means to them.

A strong message on the value of Open Science to researchers is required. Rather than an extra burden for researchers, it should be seen as the source of opportunities. Peer to peer promotion of Open Science was identified as an essential ingredient of this with the need to identify Open Science evangelists from the researcher community to highlight the benefits. Stakeholders, in particular researchers want to hear benefits directly from their peers, not only from official institutions and their related

ministry.

Early stage researchers need to be also brought on board, as the impact of Open Science on their career is essential to them. Incentives and reward schemes examples for universities and researchers themselves were suggested.

[Click here for the presentations from this session.](#)



Elena Giglia, University of Turin

Plenary 4 – EOSC as a Federation

Chair: Jan Hrušák, Czech Academy of Sciences, ESFRI, EOSC EB & Landscape WG Chair
Related EOSC WG: Landscape

The plenary session related to the EOSC regional and federated projects concluded the day, as Lene Krol Andersen talked about EOSC Nordic and its mission to make the EOSC work in practice in Northern Europe. Participants discussed how to sustain the project, as well as sensitive data and orchestration. The knowledge hub model is in preparation.

Participants of the session also talked about EOSC Synergy, where the next deliverable will come out in April 2020. The regional project EOSC-Pillar identified its targets through the national initiatives survey launched across Austria, Belgium, France, Germany, and Italy; its inter-project collaboration agreement is

scheduled to be signed in December 2019.

ExpANDS, a federation of European photon and neutron research infrastructures, already has more than 22000 users and is used across the continent. NI4OS, whose mission is to contribute long term to EOSC in South-eastern Europe, plans to onboard 20 services and 15 repositories.

During the discussion, Lene Krol Andersen also mentioned that the Sustainability WG needs to ensure that the projects will produce something that will be used. She suggested that there is a need to define the sustainability criteria for EOSC.

[Click here for the presentations from this session.](#)

Day 3

Breakout Session 5

EOSC for life & environmental sciences

Chairs: Niklas Blomberg, ELIXIR & Andreas Petzold, Jülich Research Centre

Life and environmental sciences are crucial for EOSC. The life science cluster, EOSC-Life brings together biological and medical research infrastructures to create an open collaborative space for digital biology. It aims to publish FAIR life science data resources for cloud use creating an ecosystem of innovative tools, enabling ground-breaking data-driven research in Europe.

The environmental sciences cluster, ENVRI-FAIR will implement the ENVRI-hub, a virtual, federated machine-to-machine interface to access environmental data and services provided by the contributing RIs. The complete set of thematic data services and tools will be incorporated into the EOSC service catalogue, through the EOSC-hub Marketplace.

Researchers produce huge amounts of data, so corresponding computing infrastructures are needed, Diego Scardaci from EGI pointed out. EOSC facilitates this, but the cloud should

be highly automated, scalable and always available. The fact that there is more public open data, and the implementation of FAIR principles can improve productivity of research and development, argued Susanna Sansone, Associate Director of the Oxford e-Research Centre.

Frederik Coppens, Head of Node of ELIXIR Belgium, argued that FAIR requirements need to be brought into researchers' hands, with data management that allows them to generate FAIR data without even realizing it. To achieve this, better software is needed, ELIXIR's Mateusz Kuzak added, but he also would like to see more guidelines by EOSC on how to develop software. "Translators between the IT world and the scientific world are needed," Andreas Petzold, Coordinator of ENVRI-FAIR concluded.

[Click here for the presentations from this session.](#)



Niklas Blomberg, ELIXIR & Andreas Petzold, Jülich Research Centre



Dick Schaap, Blue-Cloud

Social & Cultural Data – Taking the Users’ Perspective

Chair: Ron Dekker, CESSDA & EOSC EB

Iona von Stein, DANS opened this stimulating session by talking about FAIR data in trustworthy repositories. The research data ecosystem is not only made by digital objects: the context should be considered as well, so not just the content but also the repository, which preserves, manages and provides access to digital material. Trust is a central element and FAIR repositories enhance accessibility, she concluded.

Béla Janky, Tárki Foundation, Hungary, argued that researchers receive no incentive to produce and share user-friendly data. The question is if one should trust the results published in the journals. Popular press has reported on significant shortcomings, he said. The rise of open data / data sharing has supported this criticism and put constraints on data manipulation. However, users need comprehensive data collections on a specific issue.

Judit Gárdos, Centre for Social Sciences at the Hungarian Academy of Sciences, highlighted

the importance of requesting consent when dealing with sensitive data consent. If this is missing, the issue can be solved through data anonymization. Although this is a useful practice, it is also expensive and leads to a loss of information, granularity and findability.

Understanding rules and policies is a fundamental condition for access, Carsten Thiel, CESSDA argued. Travel is often needed to access data, especially in the case of libraries. The final goal should be to move data closer to users and to make it as user-friendly as possible. LIBER’s Vasso Kalaitzi mentioned the SSHOC project, which is currently building an expertise strategy. SSHOC is broadening its network to external actors and stakeholders. It will contribute to the overall ecosystem of Training and Skills in the EOSC. The project is gathering existing training material in related projects in order to create the Train-the-Trainer Toolkit.

[Click here for the presentations from this session.](#)

Plenary 5 – Users at the center of EOSC

Chair: Anca Hienola, Finnish Meteorological Institute

The day continued with the Users at the centre of EOSC plenary session, where the panelists, Niklas Blomberg (EOSC-Life), Ron Dekker (SSHOC), Andreas Petzold (ENVRI-FAIR), Andy Gotz (PaNOSC), Giovanni Lamanna (ESCAPE), Emanuele Storti (Eurodoc) and Sverker Holmgren (The Guild of European Research-Intensive Universities) pointed out that EOSC is not one thing, nor an infrastructure, and it should have incentives for FAIR. Amidst the challenges in making EOSC more accessible, one widely recognised positive aspect of it is that thanks to it many researchers and infrastructures

think bigger, and outside of their community, as stated by Andreas Petzold.

Regarding users, according to Niklas Blomberg, the main question to ask shouldn’t be “Who are the users?”, but rather “What are the use cases?”, since EOSC is not a one stop shop, and sometimes the same individual might work at different organisations or even has different positions. The panel agreed that researchers are getting increasingly familiar with EOSC, but they should be more engaged, and the users will go where they can trust the handling of data.

[Click here for the presentations from this session.](#)

Plenary 6 – Looking at the future & focus on implementation roadmap

Chair: Sarah Jones, Digital Curation Centre, EOSC EB & FAIR WG Chair

This session focused on different stakeholder perspectives and visions on the future EOSC roadmap, its implementation, and to understand priorities and insights to help guide future work. The all-female panel was introduced by Sarah Jones, DCC & EOSC FAIR WG chair, who stressed the importance of the steps to be taken in order to have a functioning EOSC by the end of 2020. She also encouraged an interactive discussion with the audience,

through the collection of questions.

Panellists agreed that “This community has the knowledge to make EOSC work. The challenge is to empower all stakeholders to pool their expertise towards that goal.” A goal that looks even further ahead, beyond 2020, to fully achieve the principles of open sharing and collective action for EOSC.

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EOSC Project List

Project Acronym	Project Name	Start Date	End Date	Website
AENEAS	Advanced European Network of E-infrastructures for Astronomy with the SKA	Jan-17	Dec-19	www.aeneas2020.eu
AGINFRA+	Accelerating user-driven e-infrastructure innovation in Food Agriculture	Jan-17	Dec-19	plus.aginfra.eu
ARCHIVER	Archiving and Preservation for Research Environments	Jan-19	Dec-21	www.archiver-project.eu
BE OPEN	European forum and oBservatory for OPEN science in transport	Jan-19	Jun-21	beopen-project.eu
Blue Cloud	Piloting innovative services for Marine Research & the Blue Economy	Oct-19	Sep-22	www.blue-cloud.org
CatRIS	Catalogue of Research Infrastructure Services	Jan-19	Jun-21	project.catris.eu
CINECA	Common Infrastructure for National Cohorts in Europe, Canada, and Africa	Jan-19	Dec-22	www.cineca-project.eu
COS4CLOUD	Co-designed Citizen Observatories Services for the EOS-Cloud	Nov-19	Feb-23	https://cordis.europa.eu/project/id/863463
	Interactive and agile/responsive sharing mesh of storage, data and applications for EOSC	Jan-20	Dec-22	https://cordis.europa.eu/project/id/863353
DARE	Delivering Agile Research Excellence on European e-Infrastructures	Jan-18	Dec-20	project-dare.eu
DEEP	Designing and Enabling E-infrastructures for intensive Processing in a Hybrid DataCloud	Nov-17	Apr-20	deep-hybrid-datacloud.eu
	Support to a Digital Health and Care Innovation initiative in the context of Digital Single Market strategy	Jan-19	Dec-20	digitalhealtheurope.eu
e-IRGSP6	e-Infrastructure Reflection Group Support Programme 6	Jan-19	Jun-21	e-irgsp6.e-irg.eu
eInfraCentral	European E-Infrastructure Services Gateway	Jan-17	Jun-19	einfracentral.eu
EOSC Enhance	Enhancing the EOSC portal and connecting thematic clouds	Dec-19	Nov-21	www.eosc-portal.eu

Project Acronym	Project Name	Start Date	End Date	Website
ENVRI-FAIR	ENVIRONMENTAL RESEARCH Infrastructures building Fair services Accessible for society, Innovation and Research	Jan-19	Dec-22	envri.eu
EOSC Secretariat	EOSC Secretariat	Jan-19	Jun-19	eoscsecretariat.eu
EOSC-hub	Integrating and managing services for the European Open Science Cloud	Jan-18	Dec-20	eosc-hub.eu
EOSC-Life	Providing an open collaborative space for digital biology in Europe	Mar-19	Feb-23	www.eosc-life.eu
EOSC-Nordic	EOSC-Nordic	Sep-19	Aug-22	www.eosc-nordic.eu
EOSC-Pillar	Coordination and Harmonisation of National Initiatives, Infrastructures and Data services in Central and Western Europe	Jun-19	Jun-22	www.eosc-pillar.eu
EOSC-Synergy	European Open Science Cloud - Expanding Capacities by building Capabilities	Sep-19	Feb-22	www.eosc-synergy.eu
EOSCpilot	The European Open Science Cloud for Research Pilot Project	Jan-17	May-19	eosc-pilot.eu
ESCAPE	European Science Cluster of Astronomy & Particle physics ESFRI research infrastructures	Feb-19	Jul-22	www.projectescape.eu
ExPaNDS	EOSC Photon and Neutron Data Services	Sep-19	Aug-22	expands.eu
FAIR4Health	Improving Health Research in EU through FAIR Data	Dec-18	Nov-21	www.fair4health.eu
FAIRplus	FAIRplus	Jan-19	Jun-22	fairplus-project.eu
FAIRsFAIR	Fostering Fair Data Practices in Europe	Mar-19	Feb-22	fairsfair.eu
FNS-Cloud	Food Nutrition Security Cloud	Oct-19	Sep-23	www.fns-cloud.eu
FREYA	Connected Open Identifiers for Discovery, Access and Use of Research Resources	Dec-17	Nov-20	www.project-freya.eu
GN4-3	Horizon 2020: H2020-SGA-INFRA-GEANT-2018 Topic [b] Increase of Long-Term Backbone Capacity	Jan-19	Dec-22	www.geant.org
ICEDIG	Innovation and consolidation for large scale digitisation of natural heritage	Jan-18	Mar-20	www.icedig.eu
INODE	Intelligent Open Data Exploration	Nov-19	Oct-22	www.inode-project.eu

Project Acronym	Project Name	Start Date	End Date	Website
NEANIAS	Novel EOSC services for Emerging Atmosphere, Underwater and Space Challenges	Nov-19	Oct-22	www.neanias.eu
NI4OS-Europe	National Initiatives for Open Science in Europe	Sep-19	Aug-22	ni4os-europe.eu
OCRE	Access to Commercial Services Through the EOSC-hub	Jan-19	Dec-21	www.ocre-project.eu
OpenAIRE-Advance	OpenAIRE Advancing Open Scholarship	Jan-18	Dec-20	www.openaire.eu
OpenRiskNet	Open e-Infrastructure to Support Data Sharing, Knowledge Integration and in silico Analysis and Modelling in Risk Assessment	Dec-16	Nov-19	openrisknet.org
PaNOSC	Photon and Neutron Open Science Cloud	Dec-18	Nov-22	panosc.eu
PRIMAGE	PRedictive In-silico Multiscale Analytics to support cancer personalized diaGnosis and prognosis, Empowered by imaging biomarkers	Dec-18	Nov-22	www.primageproject.eu
PROCESS	PROviding Computing solutions for ExaScale ChallengeS	Nov-17	Oct-20	www.process-project.eu
RDA Europe 4.0	Research Data Alliance	Mar-18	May-20	www.rd-alliance.org
SSHOC	Social Sciences & Humanities Open Cloud	Jan-19	Apr-22	sshopencloud.eu
TRIPLE	Transforming Research through Innovative Practices for Linked interdisciplinary Exploration	Oct-19	Oct-23	https://cordis.europa.eu/project/id/863420/en
VirtualBrain Cloud	Personalized Recommendations for Neurodegenerative Disease	Dec-18	Nov-22	virtualbraincloud-2020.eu
XDC	eXtreme DataCloud	Nov-17	Jan-20	www.extreme-datacloud.eu

[Click here for the full list of participants.](#)



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