European Open Science Cloud

EOSC Skills & Training WG
Recommendations to SRIA

Sadia Vancauwenbergh, 2020-10-20
EOSC – Vision of the European Commission

“Europe’s final transition must be one from fragmented data sets to an integrated European Open Science Cloud. By 2020, we want all European researchers to be able to deposit, access and analyse European scientific data through a European Open Science Cloud.”

Carlos Moedas, Amsterdam, 4 April 2016

EOSC Declaration, Brussels, 10 July 2017
From the current model of European data infrastructures

- Data
- Computing
- Storage
- Applications
- Software

Towards a federated model, with a universal access to data and building on a strong legacy.
From strategy ...

- Timeline of practical outputs

- 5 identified priority areas in EOSC
  - Landscape
  - FAIR
  - Architecture
  - Rules of participation
  - Sustainability
  - Skills and Training

- Background information

Source: eosc-portal.eu
To work plan

- First iteration of activities
- Timelines, methods for delivery and key inputs
- Activities including the most recently approved H2020 projects
EOSC Governance framework

Source: EOSC Strategic Implementation Roadmap 2018-2020, May 2018, European Commission
# Timeline of EOSC working groups

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Landscape (Jan Hrusak)</th>
<th>Sustainability (Rupert Lueck)</th>
<th>Architecture (JF Abramatic)</th>
<th>FAIR (Sarah Jones)</th>
<th>Rules of Participation (Juan Bicarregui)</th>
<th>EB/GB Comms Task Force (Ron Dekker)</th>
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</thead>
<tbody>
<tr>
<td>Q2 2019</td>
<td>Initial landscape mapping</td>
<td></td>
<td></td>
<td>Annual FAIR workplan</td>
<td></td>
<td>Continual comms engagement via Liaison Platform &amp; Stakeholder Community events</td>
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<tr>
<td>Q3 2019</td>
<td>Final landscape mapping</td>
<td></td>
<td></td>
<td>Outline PID policy</td>
<td>Initial EOSC Rules of Participation</td>
<td>EOSC brand Trademark</td>
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<tr>
<td>Q4 2019</td>
<td>Report on EOSC readiness</td>
<td></td>
<td></td>
<td>EOSC Interoperability framework (joint output)</td>
<td>Final EOSC Rules of Participation</td>
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<tr>
<td>Q1 2020</td>
<td>Revised Workplan</td>
<td>Annual FAIR workplan</td>
<td></td>
<td>Updated PID policy</td>
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<td>Q2 2020</td>
<td>Preliminary connection of infrastructures and services EOSC Catalogue of datasets</td>
<td></td>
<td></td>
<td>Updated FAIR metrics &amp; repository certification</td>
<td></td>
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<tr>
<td>Q3 2020</td>
<td>Strategic &amp; financing options post 2020</td>
<td></td>
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<td>Updated PID policy</td>
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Source: EOSC Work Plan 2019-2020
EOSC Skills and training WG

Objective: To provide a framework for a sustainable training infrastructure for EOSC

SKILLS
- Competences

TRAINING
- Capabilities
EOSC Skills and training WG

- Organisational culture change and service development
- Capabilities for trainers, “research data stewards” and service providers

- Institutions
- Research support staff
- Researchers
- Policy makers
- EOSC Service providers

Key components for skills development?

Key components for training /infrastructure?
Open Consultation

for the
Strategic Research and Innovation Agenda (SRIA)
of the
European Open Science Cloud (EOSC)
SRIA – Objectives

**European Open Science Cloud Objectives Tree**

<table>
<thead>
<tr>
<th>Problems</th>
<th>Researcher Objectives</th>
<th>Infrastructure Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public and private sectors do not exploit Open Science for improving</td>
<td>Researchers do not combine and build upon ever-growing available scientific results</td>
<td>National, European and global infrastructures do not share Open Science standards and</td>
</tr>
<tr>
<td>quality and productivity of research</td>
<td></td>
<td>practices</td>
</tr>
<tr>
<td><strong>PEOPLE</strong></td>
<td><strong>DATA</strong></td>
<td><strong>INFRASTRUCTURES</strong></td>
</tr>
<tr>
<td>Absence of incentives, rewards and skills for open sharing stifles the</td>
<td>Scientific results are unfindable, inaccessible, not interoperable, and often used</td>
<td>Scientific landscape consists of national and disciplinary research silos and infrastructures</td>
</tr>
<tr>
<td>uptake of Open Science</td>
<td>only once</td>
<td><strong>FEDERATION</strong></td>
</tr>
<tr>
<td><strong>OPEN</strong></td>
<td><strong>FAIR</strong></td>
<td></td>
</tr>
<tr>
<td>Open Science practices and skills are rewarded and taught, becoming the</td>
<td>Standards, tools and services allow researchers to find, access, reuse and combine</td>
<td>Sustainable and federated infrastructures enable open sharing of scientific results</td>
</tr>
<tr>
<td>‘new normal’</td>
<td>results</td>
<td></td>
</tr>
<tr>
<td><strong>SCIENCE</strong></td>
<td><strong>INDUSTRY</strong></td>
<td></td>
</tr>
<tr>
<td>Improved trust, quality and productivity in science</td>
<td>Development of innovative services and products</td>
<td>Improved impact of research in addressing societal challenges</td>
</tr>
<tr>
<td><strong>SOCIETY</strong></td>
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Source: EOSC Skills and training WG, tentative
Aim:
to leverage the potential of EOSC for open and data-intensive research

Key challenge:
highly and appropriately skilled people with an excellent knowledge of standards and best practices for delivering, using, sharing and analysing open and FAIR data, and applications and tools (services)

Gap Analysis:

- Lack of digital core expertise: open science or data-related skills
- Lack of clear definition of digital professional profiles and career paths
- Disparities: geographical, disciplinary, gender, age (career stage)
- Lack of open science expertise: FAIR-by-design

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
SRIA – Gap analysis

- Gap analysis:
  - Lack of digital core expertise: open science or data-related skills
  - Lack of clear definition of digital professional profiles and career paths
  - Disparities: geographical, disciplinary, gender, age (career stage)
  - Lack of open science expertise: FAIR-by-design
  - Lack of legal/IPR and data ethics expertise
  - Lack of interdisciplinarity: baseline approach vs infinite atomisation
  - Fragmentation in training resources

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
SRIA – Skills challenge

- EOSC ecosystem

- ICT-Specific
  Developing Software

- Library & inform. Sci.
  Understanding Data

- Discipline Specific
  Conducting Research

- General Public

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
SRIA - Priorities

- **EOSC:**
  - coordinates the training offered at institutional, regional and national level
  - helps standardise educational curricula and professionalise roles

- **Priorities:**
  - Developing the next generation of open science professionals
  - Coordinating training and aligning curricula for students and researchers
  - Building a trusted and long-lasting knowledge hub of learning materials and related tools
  - Developing and EOSC leadership programme to foster the right policy environment for skills and training

*In collaboration with other key European Initiatives, and new ERA priorities*

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
P1: Developing next gen of open science and data professionals

- P1.1: Enhance professional digital career paths
- P1.2: Develop digital skills profiles
- P1.3: Recognize digital skills
- P1.4: Quality assurance framework and certification mechanisms
  - Standards
  - Quick adaptation
  - Measurement
  - Recognition across borders
- P1.5: Life-long learning mechanisms
- P1.6: Align Digital Competence Centres

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
P2: Coordination and aligning curricula for students and researchers

- P2.1: Align curricula and training with demand
- P2.2: Support to specific disciplinary and professional practices
- P2.3: Up-skill all levels of researchers
- P2.4: Reward early career researcher for open science practices
- P2.5: Network of researchers-champions in open science
- P2.6: Advanced learning environments

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
P3: Building a trusted and long-lasting knowledge hub of learning materials and related tools

- P3.1: Quality assurance and certification framework
- P3.2: Common framework for learning pathways
- P3.3: EOSC Knowledge/Education Hub
- P3.4: Adoption of open learning environments
- P3.5: Innovative ways of learning

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
P4: Developing an EOSC leadership programme to foster the right policy environment for skills and training

- **Leadership programme**
  - Create, update and coordinate nation open science and digital skills policies and activities
  - Create digital culture shift in:
    - the policy making community
    - Universities and higher education

- **Community of influencers** that support the aims of EOSC
  - Affect change in national environments
  - Ensure that policy decisions ensure success in the digital revolution

- **Key actions:**
  - Promote transparency and recognition of skills and qualifications
  - Foster an equitable and balanced digital research labour market
  - Strengthen cross-sector mobility and employability
  - Invest in people to create an ecosystem that promotes learning, experimenting and growth
  - Build resilience into digital skills and training, at the same pace as technological developments
  - Embed the human factor in order to recognise when changes are coming along the developing technology

Source: EOSC Skills and training WG, SRIA_V0.8, tentative
Multi-Annual Roadmap (v4.5)

- MVE = EOSC\textsuperscript{H2020} + EOSC\textsuperscript{HorizonEurope} + EOSCMember States & National Funding Agencies

### Minimal Viable EOSC (MVE)

- **EOSC-Gov**
  - Prepare
  - Grow

- **EOSC-Core**
  - Prepare
  - Grow

- **Federated infrastructures**
  - Prepare
  - Grow

- **EOSC-Exchange**
  - Prepare
  - Grow

### Wider Public Sector

- **2020**
  - Prepare
  - Grow

### Private Sector

- **2021**
  - Prepare
  - Grow

- **2023**
  - Prepare
  - Grow

- **2025**
  - Prepare
  - Grow

- **2027**
  - Prepare
  - Grow

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Source: EOSC Skills and training WG, MAR_v4.5, tentative
MAR – Stage 1 (2021-2022)

**SRIA Prioritized activities in 4 general areas**

- Building on or completing the key components of the MVE and providing a technical federating environment
- Enabling Open Science and delivering scientific impact
- Enabling sustainability and engagement
- Enabling the web of FAIR data at the researcher level

**Objectives:**

- Develop Open Science practices as the new normal; ensure the new normal by coordination and communication activities that promote Open Science
  - Develop an effective governance framework that coordinates activities and steers development of the MVE (Tier 1); Develop a cooperation framework to implement rules of participation (Tier 1 & Tier 2); Develop cost model and future business models for sustainability (Tier 1, Tier 2 & Tier 3); Develop the next generation of FAIR data management professionals (Tier 1, Tier 2 & Tier 3); Align and standardise training frameworks for researchers (Tier 1, Tier 2 & Tier 3); Create a rewards and recognition framework that incentivises FAIR and Open Science (Tier 2); Inform stakeholders and engage with communities (Tier 1 & Tier 3); Promote EOSC at all levels (Tier 1, Tier 2 & Tier3)

- Building an Open Science community based on shared publications, data and software, enabling exploitation of a FAIR data via thematic clouds
  - Ensure that domain specific user environments are included in EOSC (Tier 1 & Tier 3); Support research communities to develop and adopt disciplinary standards where required (Tier 2 & Tier 3); Develop open specifications and metadata framework for improved discovery and interoperability (Tier 1); Develop common standards for interoperability and support development of schemas and APIs (Tier 1 & Tier 3); Development of standards and tools to archive, reference, describe and cite research software (Tier 1); Research funders and institutions to encourage and incentivise effective documentation and sharing of research software, investing in best-practice guidelines and infrastructure to enable this (Tier 2, Tier 3)

- A functional, performant federation of research infrastructures
  - Common standards and framework for minimum metadata (Tier 1); Common digital search enables discovery and exchange across federated repositories (Tier 1); Metadata support and coordination for research communities (Tier 1 & Tier 3); Authentication and Authorization Infrastructure (AAI) — Establish common framework for managing AAI (Tier 1)

*Tier 1: EC; Tier 2: Member states/National funders; Tier 3: Institutions*

Source: EOSC Skills and training WG, MAR_v4.5, tentative