EOSC Future

WP2 Report

EOSC Catalogue of Best Practices

WP2 Report / EOSC Catalogue of Best Practices

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Dissemination Level of the Document

Public

Abstract

The EOSC Catalogue of Best Practices provides a non-exhaustive list of best practice use cases from across Europe. The use cases have been collected via the survey on National Contributions to EOSC 2021 that was conducted under the EOSC Future project and aimed at representatives of Member States and Associated Countries in the EOSC Steering Board. The catalogue offers an initial overview of some of the national activities and collective dedication towards EOSC and Open Science and will be updated on an annual basis.

Version History

Version	Date	Authors/Contributors	Description
V0.1	07/11/2022	Istvan Karasz, Thomas Neidenmark, and Gareth O'Neill	Table of contents finalised
V0.2	14/11/2022	Istvan Karasz and Thomas Neidenmark	Excel sheet compiled of use cases from EOSC-SB Survey 2021
V0.3	15/12/2022	Istvan Karasz, Thomas Neidenmark, and Gareth O'Neill	Initial draft of report composed
V0.4	13/01/2023	Sofia Abrahamsson, Volker Beckmann, Istvan Karasz, Thomas Neidenmark, and Gareth O'Neill	Draft of report updated and validated by EOSC-SB
V0.5	30/01/2023	Sofia Abrahamsson, Volker Beckmann, Istvan Karasz, Thomas Neidenmark, and Gareth O'Neill	Report quality reviewed and comments incorporated
V0.6	31/01/2023	Istvan Karasz, Thomas Neidenmark, Gareth O'Neill, and Athanasia Spiliotopoulou	Draft report technically reviewed, and comments incorporated
V1.0	31/01/2023	Istvan Karasz, Thomas Neidenmark, and Gareth O'Neill	Final version of report published

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Glossary

EOSC Future project Glossary is incorporated by reference: https://wiki.eoscfuture.eu/x/JQCK

List of Abbreviations

Acronym	Definition
AAI	Authentication and Authorisation Infrastructure
AAP	Additional Activities Plan
AUP	Acceptable Use Policy
ARC	Athena Research Centre
DPP	Data Privacy Policy
EC	European Commission
EC/RTD	European Commission, Directorate-General for Research and Innovation
EGI	EGI Foundation
EOSC	European Open Science Cloud
EOSC-A	EOSC Association
EOSC-SB	EOSC Steering Board
ERA	European Research Area
FAIR	Findable, Accessible, Interoperable, Reusable
JNP	JNP Strategy and Management Consulting
KPI	Key Performance Indicator
MESR	Ministry of Higher Education, Research and Innovation in France
MS/AC	Member States and Associated Countries
RFO	Research Funding Organisation
RPO	Research Performing Organisation
SRIA	Strategic Research and Innovation Agenda
TGB	Technopolis Group Belgium
VR	Vetenskapsrådet (Swedish Research Council)

1   Introduction

1.1   Scope of the Catalogue

The EOSC Catalogue of Best Practices 2022 presents use cases highlighting the implementation of the European Open Science Cloud (EOSC) and Open Science by Member States (MS) and Associated Countries (AC) of the EOSC Steering Board (EOSC-SB) [1]. The use cases presented in this report were identified by MS/AC between 03 December 2021 and 01 August 2022 and were collected via the EOSC-SB Survey on National Contributions to EOSC 2021 [2] in the EOSC Observatory [3]. In the EOSC Tripartite Governance event on 16 and 17 December 2021 [4], the need to accelerate the implementation of the EOSC priorities was agreed. One identified priority targeted the alignment of policies, practices, and investments at European, national, federal, regional, and institutional levels to foster synergies and leverage effects of the conducted actions. The practices were suggested to be visualised in an EOSC Catalogue of Best Practices. Identifying and showcasing best practices is furthermore a targeted outcome of the ERA Action 1 'Enable the Open Sharing of Knowledge and the Re-use of Research Outputs, including through the Development of the EOSC' [5].

This first EOSC Catalogue of Best Practices does not claim to rank the reported examples but lists only what the countries themselves have identified as EOSC-relevant use cases via the Survey on National Contributions to EOSC 2021. The catalogue presents one of the concrete outcomes of the annual survey by EOSC-SB and the intensive work and exchange of EOSC implementation efforts that have taken place during 2022. The catalogue provides policy makers and the EOSC community with reference examples on the implementation of EOSC and Open Science across Europe. The use cases are not only relevant for EOSC-SB but are also relevant for the EOSC Association (EOSC-A) and are explicitly linked to the general, specific, and operational objectives proposed in the Strategic Research and Innovation Agenda (SRIA) for the EOSC Partnership [6].

1.2   EOSC-SB Monitoring Framework

The Monitoring Framework for National Contributions to EOSC [7] consists of three high-level monitoring dimensions: Policies which guide the implementation of EOSC; Practices which consist of actions being undertaken to implement EOSC; Impact which involves outcomes showing the implementation of EOSC.

These dimensions are divided into eight categories that are crucial for EOSC and Open Science:

- Publications = research publications that are available in Open Access;
- Data = research data management and research data that is FAIR/open;
- Software = software that enables research and is available in open source;
- Services = services that enable research data discovery and exploitation;
- Infrastructure = data stewardship, data repositories, and data preservation;
- Skills/training = skills and training for researchers to practice Open Science;
- Assessment = incentives and rewards for researchers to practice Open Science;
- Engagement = research that engages and involves citizens via citizen science.

There are four types of indicators for policies across the eight EOSC categories:

- Share of countries with a national policy on X;
- Share of countries with a financial strategy on X;
- Share of Research Performing Organisations (RPOs) with a policy on X;
- Share of Research Funding Organisations (RFOs) with a policy on X.

There are four types of indicators for practices across the eight EOSC categories:

- Share of countries with national monitoring on X;
- Share of countries with use cases on X;
- Share of country investments in X;
- Share of country outputs in X.

There are currently no indicators proposed for monitoring impact as these will be developed collaboratively with EOSC-SB and relevant EOSC and Open Science stakeholders by EOSC Future in 2023. The monitoring framework forms the basis for the Survey on National Contributions to EOSC 2022 [8] as well as for all future EOSC-SB annual surveys. The indicators in the monitoring framework have been directly translated into questions in the EOSC-SB survey 2022. The use cases presented in this catalogue will be updated in all future EOSC-SB annual surveys, whereby the catalogue will essentially be a living catalogue of current use cases. The catalogue has categorised the use cases into the eight categories relevant for EOSC as shown in Figure 1.1.
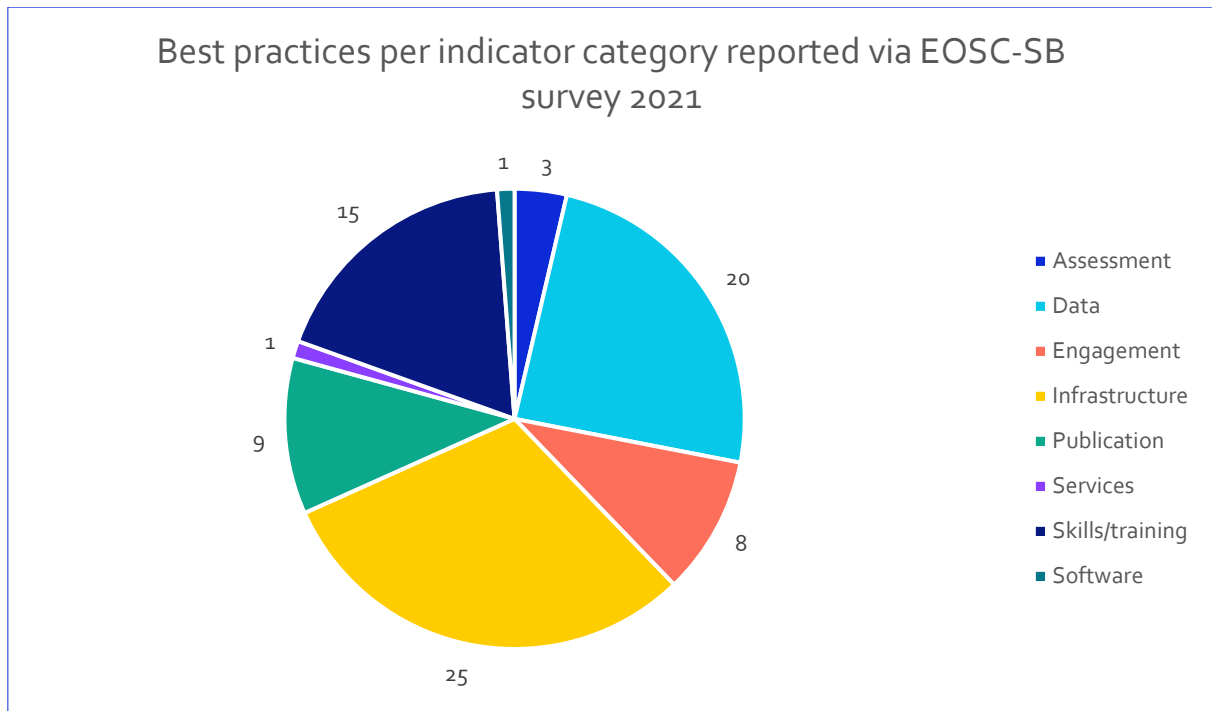

Figure 1.1: EOSC Best Practices per Categories relevant for EOSC reported in EOSC-SB Survey 2021

1.3 Links to EOSC SRIA Objectives

The EOSC SRIA which is being implemented by EOSC-A defines the general, specific, and operational objectives and the related action areas of the European co-programmed EOSC Partnership until 2030.

1.3.1 General Objectives (GO):

GO1: Ensure that Open Science practices and skills are rewarded and taught, becoming the 'new normal';

GO2 Enable the definition of standards, and the development of tools and services, to allow researchers to find, access, reuse and combine results;

GO3: Establish a sustainable and federated infrastructure enabling open sharing of scientific results.

1.3.2 Specific Objectives (SO):

SO1: Increase in the number of relevant research results that are made available as open as possible by researchers performing publicly funded research;

SO2: Professional data stewards are increasingly available in research-performing organisations in Europe to support Open Science;

SO3: Development and adoption of incentives for researchers to perform Open Science;

SO4: Increasing amounts of research data produced by publicly funded research in Europe are FAIR by design;

SO5: The EOSC Interoperability Framework supports an increasing range and quantity of FAIR digital objects including data, software, and other research artefacts;

SO6: Provide an increased number of services and resources to ensure that European research is discovered and reused within and across disciplines to extract new knowledge;

SO7: EOSC is operationalized and provides a stable and valuable infrastructure supporting researchers addressing societal challenges;

SO8: Essential additional functionalities for end users from the public and private sectors are implemented in EOSC (these developments are complementary to those of other European data spaces);

SO9: EOSC increasingly establishes ties with related initiatives from regions around the world and becomes a partner in global cooperation frameworks for Open Science.

1.3.3 Operational Objectives (OO):

OO1: Deliver and operate all the necessary components of the Minimum Viable EOSC to share openly research data, publications, software, tools and services while attracting increasing numbers and categories of users (public and private) (based on a governance structure representative of the various stakeholders and including domain-specific user environments supporting Open Science) by 2025;

OO2: Make monitoring systems to gather data and evidence on best Open Science practices accessible through EOSC (including the development of a dashboard to monitor the evolving landscape of policies, infrastructures and open resources made accessible via EOSC by 2023);

OO3: Increasingly mainstream Open Science skills in European research-performing organisations (RPOs), including through the uptake of curricula and training frameworks related to data stewardship through the lifespan of the Partnership;

OO4: Co-develop domain-specific standards and adopt Open Science practices through the engagement with research communities during the lifespan of the Partnership;

OO5: Provide the technical components of a FAIR ecosystem for uptake and customisation by the communities by 2023 (including open specifications, standards, schemas, application programming interfaces (APIs), metadata frameworks supporting FAIR digital objects and their automated processing);

OO6: Provide the metrics and tools to measure the adoption of the FAIR principles for research artefacts and provide frameworks to help in certifying that repository services enable FAIR in EOSC throughout the lifespan of the Partnership;

OO7: Co-develop a first generation of a robust pan-European network of infrastructures for software source code (including incentives for the effective documentation and sharing of research software) by 2025;

OO8: Co-design and adopt a rewards and recognition framework for FAIR and open data practices in research during the lifespan of the Partnership;

OO9: Implement and evolve the EOSC Rules of Participation and onboarding process for EOSC providers and increase the number of service providers and services offered progressively over the course of the Partnership;

OO10: Deploy and operate an authentication and authorisation infrastructure (AAI) framework to manage user identity and access by 2024;

OO11: Implement the EOSC persistent identifier (PID) policy and architecture by 2025;

OO12: Co-develop a minimum metadata framework and provide a common search and access mechanism to EOSC resources across the EOSC federation by 2025;

OO13: Continuously monitor and promote the increased uptake of core services and EOSC resources, access to EOSC Exchange tools and services and ensure a feedback loop with the users;

OO14: Define models for availability and costing of services across borders by 2023.

2 EOSC Catalogue of Best Practices

2.1 Best Practices Targeting 'Publications'

National Open Science Programme	A national programme for stimulation of scientific publications and open access to scientific information is currently under implementation		
	Bulgaria	Link: https://bpos.bg	Relevant to SRIA GO1, SO1, OO8
Monitoring Model	Monitoring Model for Open Science and Research - Principles and Practices		
	Finland	Link: https://doi.org/10.23847/tsv.238	Relevance to the SRIA: GO1, SO1, OO2
Mainstreaming Open Access	HEAL-Link is involved in open access initiatives such as SCOAP3 and negotiates with scientific publishers, representing all Greek academic and research libraries to make a provision for open access publications alongside with the access to the full text of the subscribed content		
	Greece	Link: https://scoap3.org	Relevance to SRIA: GO3, SO9, OO1
Monitoring Open Access	HEAL-Link monitors the progress of its open access programmes in Greece		
	Greece	Link: https://scholarly.heal-link.gr/news/oaheal	Relevance to SRIA: GO2, SO1, OO2
Open Science Requirements	Open Science requirements in publicly funded research programmes		
	Latvia	Link: not available	Relevance to the SRIA: GO1, SO1, OO1
Diamond Open Access Journals	TUBITAK ULAKBIM promotes a sustainable community-driven diamond open access scholarly communication ecosystem and endorses 11 diamond open access journals		
	Turkey	Link: https://journals.tubitak.gov.tr/communities.html	Relevance to the SRIA: GO2, SO1, OO1
Digital Management	JournalPark is an open access journal hosting and editorial process management software to collect, evaluate, and publish manuscripts for peer-reviewed Journals		
	Turkey	Link: https://dergipark.org.tr/en	Relevance to the SRIA: GO2, SO1, OO1
National Open Science Plan	The National Open Science Plan (until 2030) has been developed by the Ministry of Education and Science of Ukraine with the help of stakeholder representatives and approved by the Ukrainian Government on 08 October 2022. Objective1 aims to ensure open access to research results and scientific information		

	Ukraine	Link: https://mon.gov.ua/eng/tag/mizhnarodni-naukovi-proekti Direct link: https://mon.gov.ua/storage/app/media/nauka/2023/01/26/National-Open-Science-Plan-Ukraine.pdf	Relevance to the SRIA: GO3, SO7, OO1
Open Peer Review Platform	The open peer review platform 'Peers International' has been created within the EU-funded Erasmus+ project OPTIMA ('Open Practices, Transparency and Integrity for Modern Academia') and is used to establish open editorial workflows for academic conferences in Ukraine		
	Ukraine	Link: https://peers.international	Relevance to the SRIA: GO2, SO1, OO1

2.2 Best Practices Targeting 'Data'

Monitoring and Coordination	Monitoring and coordination of activities of the national strategy on data management		
	Denmark	Link: https://www.deic.dk/en/data-management/national-cooperation/National-coordination-and-implementation-of-the-FAIR-strategy	Relevance to the SRIA: GO2, SO4, OO5
FAIR Data Support	RechercheDataGouv supports the FAIRisation of data with a focus on the long tail of science. It fosters training activities and sharing of expertise to make data FAIR and offers support to link published or publishable data to publications		
	France	Link: https://recherche.data.gouv.fr/en	Relevance to the SRIA: GO2, SO4, OO5
Stakeholder Engagement	The National Research Data Infrastructure (NFDI) will bring multiple stakeholders together in a coordinated network of consortia tasked with providing science-driven data services to research communities		
	Germany	Link: https://www.nfdi.de	Relevance to the SRIA: GO2, SO8, OO9
Data Management Expert Guide	The Data Management Expert Guide (DMEG) is designed by European experts to help social science researchers make their research data FAIR		
	Greece	Link: https://dmeg.cessda.eu/Data-Management-Expert-Guidehttps://dmeg.cessda.eu/Data-Management-Expert-Guide	Relevance to the SRIA: GO2, SO4, OO5
Data Management Service	ARGOS is OpenAIRE's machine-actionable Data Management Planning service		
	Greece	Link: https://argos.openaire.eu/splash	Relevance to the SRIA: GO3, SO4, OO5
Realtime Genomic Surveillance	Realtime genomic surveillance of sars-cov2, sequencing of sars-cov2 by the Laboratoire National de Santé (National Laboratory of Health)		

	Luxembourg	Link: https://lns.lu/en/real-time-genomic-surveillance/https://lns.lu/en/real-time-genomic-surveillance	Relevance to the SRIA: GO3, SO3, OO1
Data Management Plan		The National Science Centre has implemented Data Management Plans (DMPs) as a mandatory form in all applications for research funding. Moreover, the institution requires that all datasets underlying publications resulting from research projects should be shared publicly with a CC0 licence (if there are no restrictions that would justify closing them). The guidelines attached to the DMP indicate the FAIR principles, which should be taken into account when drafting the plan	
	Poland	Link: https://ncn.gov.pl/en/aktualnosci/2020-03-06-plan-zarzadzania-danymi-pytania ; https://ncn.gov.pl/sites/default/files/pliki/regulaminy/wytyczne_zarzadzanie_danymi_06_2020_ang.pdf	Relevance to the SRIA: GO1, SO4, OO5
Project Financing for Open Science		The National Science Centre provides in funded projects financial resources for Open Science activities (so called "Open Access Indirect Costs"), which include Open Science publishing, sharing research data, providing data stewards and other Open Science professionals support and ensuring long-term data preservation. The funding amounts to 2% of direct costs calculated in the project	
	Poland	Link: https://www.ncn.gov.pl/en/finansowanie-nauki/otwarta-nauka ; https://www.ncn.gov.pl/en/finansowanie-nauki/otwarta-nauka ; : https://www.ncn.gov.pl/sites/default/files/pliki/2021_10_instrukcja_open_access_NCN_ang.pdf	Relevance to the SRIA: GO1, SO3, OO14
Virtual Data Platform		The Thematic Core Service related to Anthropogenic Hazard (TCS-AH), which is a part of the European EPOS initiative, has been created and is owned by IG PAS. It is a virtual platform to gather, share, and analyse scientific data. IG PAS also supports Institutional data repository that store and share scientific data fulfilling the FAIR principles	
	Poland	Link: https://tcs.ah-epos.eu/?lang=en#	Relevance to the SRIA: GO3, SO7, OO1
Data Processing		As a partner in a number of scientific projects, Cyfronet processes research data and gives access to other scientific resources, which are openly available for researchers. This includes data and services for solid Earth science (EPOS platform), data for high-energy gamma rays (CTA project), infrastructure to deliver data and services on the gravitational wave field (Einstein Telescope), and Copernicus data and services (which is published in the Sat4Envi project in a portal for researchers and citizen scientists)	
	Poland	Link: https://www.cyfronet.pl/en/4421,main.html	Relevance to the SRIA: GO3, SO7, OO1
Data Management Guide		The Swedish Research Council and the Association of Swedish Higher Education Institutions (SUHF) have developed a template for data management plans with six central parts that a data management plan should cover. There is also a guidance to	

		the template. The template is a partially reworked version of Science Europe's 'Core Requirements for Data Management Plans'	
	Sweden	Link: https://www.vr.se/english/applying-for-funding/requirements-terms-and-conditions/producing-a-data-management-plan/data-management-plan-template.html	Relevance to the SRIA: GO2, SO8, OO3
Platform for Data Services and Data Management		SciLifeLab Data Centre is a central research data infrastructure at SciLifeLab, with responsibility for IT and data management as well as services for Open Science and FAIR data sharing. Data services are open for all users and target both researchers and data-producing research infrastructures. Services include the national Swedish COVID-19 and pandemic preparedness portal, FAIR data publishing, data management plans, and sharing of AI models and compute applications	
	Sweden	Link: https://www.scilifelab.se/data	Relevant to the SRIA: GO2, SO8, OO1
Storage and File Sharing Service		Sunet Drive is a storage and file-sharing service, which is located on Swedish servers and makes it possible for researchers to work and collaborate with large amounts of data. The service is currently limited to users in Sweden	
	Sweden	Link: https://wiki.sunet.se/pages/viewpage.action?pageId=100926004	Relevance to the SRIA: GO3, SO7, OO1
Data Management		OpenRDM.swiss offers research data management as a service to the scientific community	
	Switzerland	Link: https://www.dasch.swiss	Relevance to the SRIA: GO3, SO7, OO1
Data Repository		Swiss National Data and Service Center for the Humanities (DaSCH) develops and operates a FAIR long-term repository and a generic virtual research environment for complex and simple open research data in the humanities in Switzerland	
	Switzerland	Link: https://openbis.ch/index.php/openrdm-swiss	Relevance to the SRIA: GO2, SO8, OO3
Data Science Centre		The Swiss Data Science Centre supports the academic community and the industrial sector in their data science journey, which includes supporting Machine Learning (ML) and Artificial Intelligence (AI) and facilitating the multidisciplinary exchange of data and knowledge	
	Switzerland	Link: https://datascience.ch	Relevance to the SRIA: GO3, SO7, OO5
FAIR Data Tool		The FAIRware project is developing tools to make it easy for researchers to make their data FAIR at the point of creation	
	Switzerland	Link: https://researchonresearch.org/projects#!/tab/273951116-3	Relevance to the SRIA: GO2, SO4, OO3

Mandatory Data Management Plans	TÜBİTAK requests mandatory Data Management Plans for the '1001' funding programme for scientific and technological research projects		
	Turkey	Link: https://vyp.ulakbim.gov.tr	Relevance to the SRIA: GO1, SO4, OO3
Data Management Software	A version of the DMPTool software helps researchers to create, review, and share data management plans that meet both institutional and funder requirements		
	Turkey	Link: https://vyp.ulakbim.gov.tr	Relevance to the SRIA: GO1, SO4, OO3
National Open Science Plan	The National Open Science Plan (until 2030) has been developed by the Ministry of Education and Science of Ukraine with the help of stakeholder representatives and approved by the Ukrainian Government on 08 October 2022. Objective 3 aims to set the baseline conditions for effective work with scientific and technical information and research infrastructure in open access		
	Ukraine	Link: https://mon.gov.ua/eng/tag/mizhnarodni-naukovi-proekti	Relevance to the SRIA: GO2, SO1, OO2

2.3   Best Practices Targeting 'Software'

| Open-source Software | Software Heritage collects, preserves, and shares software that is publicly available in source code form | | |
| | France | Link: https://www.softwareheritage.org | Relevance to the SRIA: GO2, SO6, OO5 |

2.4   Best Practices Targeting 'Services'

| Data and Compute Service | ELVEDAS: a data and compute as a service workflow demonstrator targeting supercomputing ecosystems | | |
| | Switzerland | Link: https://www.dora.lib4ri.ch/psi/islandora/object/psi%3A37404 | Relevance to the SRIA: GO2 |

2.5   Best Practices Targeting 'Infrastructure'

Infrastructure Developments	The Government of the Republic of Armenia and World Bank support the Institute for Informatics and Automation Problems of the National Academy of Sciences of Armenia to develop a National Supercomputing Centre in Armenia, National Research Cloud platform, pan-Armenian digital library, Armenian OpenAire Noad, and an astronomical data repository for the Byurakan Astrophysical Observatory		
	Armenia	Link: Not available	Relevance to the SRIA: GO3, SO7
Data Archive	AUSSDA - The Austrian Social Science Data Archive is a data infrastructure for the social science community in Austria and offer a variety of research support services, primarily data archiving and help with data re-use		

	Austria	Link: https://aussda.at	Relevance to the SRIA: GO3, SO7, OO9
Data Repository	Phaidra is the repository for the permanent secure storage of digital assets at the University of Vienna		
	Austria	Link: https://phaidra.univie.ac.at	Relevance to the SRIA: GO3, SO7, OO5
Stakeholder-Driven Governance of Open Science	The Flemish Open Science Board and the Flemish Open Science Policy is a use case of co-creation of Open Science policy and Key Performance Indicators (KPIs) Flanders		
	Belgium	Link: https://www.ewi-vlaanderen.be/nieuws/flemish-open-science-board-fosb-opgericht	Relevance to the SRIA: GO2, SO9, OO4
Natural History Archives and Information Network	The Estonian research infrastructures roadmap on 'Natural History Archives and Information Network' (NATARC) develops services related to hosting and computing of scientific repositories and data archives for the natural sciences		
	Estonia	Link: https://natarc.ut.ee/index.php?lang=en	Relevance to the SRIA: GO3, SO7, OO13
Fair Data Support	RechercheDataGouv supports the FAIRisation of data with a focus on the long tail of science. It fosters training activities and sharing of expertise to make data FAIR, and it offers support to link published or publishable data to publications		
	France	Link: https://recherche.data.gouv.fr/en	Relevance to SRIA: GO2, SO4, OO5
Knowledge Hub	The Academia Europaea (AE) Tbilisi Knowledge Hub is the fifth regional centre for Academia Europaea. The hub shares the mission, goals, and major objectives of AE and expands AE activities in the region of South Caucasus, Eastern Partnership Countries, and Central and Western Asia		
	Georgia	Link: Not available	Relevance to the SRIA: GO1, SO9, OO3
Core Infrastructure	Hellenic Data Service HELIX is one of the core national infrastructures for research of the National Roadmap for Research Infrastructures		
	Greece	Link: https://hellenicdataservice.gr/main	Relevance to the SRIA: GO3, SO7, OO5
Repository Network	HEAL-Link is a literature repositories network		
	Greece	Link: https://hardmin.heal-link.gr	Relevance to the SRIA: GO3, SO1, OO4
Supporting Infrastructure	ELIXIR-GREECE Cloud Infrastructure (EG-CI) supports a broad spectrum of bioinformatic services. EG-CI was renamed during the last year into HYPATIA and is implemented based on the two open-source platforms SCHeMa and CLIMA		

	Greece	Link: https://www.elixir-greece.org/node/264	Relevance to the SRIA: GO2, SO7, OO5
Infrastructure Investment	In the framework of the national Growth Fund (a novel socio-economic innovation funding programme), the Dutch government has recently decided to invest €69 M for the next 7 years in realising Health-RI, which is a fully FAIR-based national health(care) data infrastructure within the medical science domain connecting all relevant Dutch stakeholders in the healthcare, research, and innovation field		
	The Netherlands	Link: Not available	Relevance to the SRIA: GO1, SO2, OO3
Big Data Infrastructure	The Norwegian Language Bank is a national infrastructure for language technology and big datasets, which provides available online resources and open source licencing		
	Norway	Link: https://www.nb.no/sprakbanken/en/resource-catalogue	Relevance to the SRIA: GO3, SO7, OO1
FAIR Repository	DataverseNO is a national generic repository for open research data from researchers from Norwegian research institutions. DataverseNO is aligned with the FAIR principles for scientific data management and stewardship and is CoreTrustSeal-certified		
	Norway	Link: https://dataverse.no	Relevance to the SRIA: GO3, SO4, OO5
Multidisciplinary Infrastructure	fourMs LAb is a national infrastructure for studies of human body movement and physiology in an immersive multimedia environment		
	Norway	Link: https://www.uio.no/ritmo/english/research/labs/fourms	Relevance to the SRIA: GO3, SO6, OO1
Data Repositories	The Disciplinary Open Research Data Repositories Project aims to enhance access to academic resources by making them available in open research data repositories, as well as to improve the quality of shared data and metadata and to facilitate their better use		
	Poland	Link: Not available	Relevance to the SRIA: GO3, SO1
National Repositories Open Access Portal	Respositorios Cientificos de Acesso Aberto de Portugal (RCAAP - The Portuguese Open Access Repositories) portal aims to collect, aggregate, and index open access scientific contents from Portuguese institutional repositories		
	Portugal	Link: https://www.rcaap.pt/about.jsp	Relevance to the SRIA: GO3, SO8, OO5
Repository Model	The Transparent Access to Research Infrastructures at the Computer Centre of the University of Belgrade (TRAP-RCUB IT) offers an organisational model and IT solutions for the implementation of institutional or thematic repositories. Thanks to a sustainable and affordable service, nearly 30 institutional repositories have been established. The main purpose of these repositories is to provide open access to research outputs and ensure their long-term preservation and reuse		

	Serbia	Link: https://repowiki.rcub.bg.ac.rs/index.php/Policy_for_Transparent_Access_to_Research_Infrastructures_at_the_Computer_Centre_of_the_University_of_Belgrade:_TRAP-RCUB_IT_solution_and_organizational_model_for_the_implementation_of_institutional_or_thematic_repositories	Relevance to the SRIA: GO2, SO1, OO14
Open Science Portal	A central portal for Open Science in Slovenia		
	Slovenia	Link: https://www.openscience.si/Default.aspx	Relevance to the SRIA: GO3, SO8, OO6
CoreTrustSeal Repository	DIGITAL.CSIC is an institutional CoreTrustSeal repository of the Spanish National Research Council		
	Spain	Link: https://digital.csic.es	Relevance to the SRIA: GO3, SO1, OO1
Research and Technology Infrastructure	Spanish Singular Research and Technology Infrastructures (ICTS) has research and resources dedicated to Open Science (e.g. SOCIB, RIA, e-Science Network)		
	Spain	Link: https://www.ciencia.gob.es/en/Organismos-y-Centros/ICTS.html	Relevance to the SRIA: GO3, SO1, OO1
Cloud Service Infrastructure	Materials Cloud is built to enable the seamless sharing and dissemination of resources in computational materials science, offering educational, research, and archiving tools; simulation software and services, and curated and raw data		
	Switzerland	Link: https://www.materialscloud.org/home	Relevance to the SRIA: GO3, SO6, OO9
Academic Archive (HARMAN)	HARMAN was built to enable widespread access from a single centre to scientific academic content limited and suitable for open access. Harman is providing easy and safe access to the contents in the country and international areas		
	Turkey	Link: https://harman.ulakbim.gov.tr/index	Relevance to the SRIA: GO2, SO8, OO3
Open Access and Data Repository	The Turkish Open Archive Aperta is a national open access and open data repository for research data management built to upload publications and related research data. Aperta, which is built on top of open source Invenio RDM (Research Data Management) software, is open to all researchers in Turkey and provides free Digital Object Identifiers (DOIs) for data sets		
	Turkey	Link: https://aperta.ulakbim.gov.tr	Relevance to the SRIA: GO3, SO1, OO1
Open Science Portal	The 'Research Data Training Portal' is being updated to a national 'Open Science Portal' where sample data management plans are shared to assist researchers in data management and sharing and to enhance researchers' understanding and adoption of open access, open data, and open science requirements		

	Turkey	Link: https://portal.ulakbim.gov.tr	Relevance to the SRIA: GO2, SO8, OO3
National Open Science Plan	The National Open Science Plan (until 2030) has been developed by the Ministry of Education and Science of Ukraine with the help of stakeholder representatives and approved by the Ukrainian Government on 08 October 2022. Objective 3 aims to create conditions for effective work with scientific and technical information and research infrastructure in open access		
	Ukraine	Link: https://mon.gov.ua/eng/tag/mizhnarodni-naukovi-proekti	Relevance to the SRIA: GO3, SO1, OO1

2.6 Best Practices Targeting 'Skills/Training'

Awareness and Training Events	The Greek OpenAIRE NOAD has organized awareness raising and training events on basic open access and research data management practices and available tools		
	Greece	Link: https://www.openaire.eu/os-greece	Relevance to the SRIA: GO1, SO4, OO3
Data Management Training	RDM training programme for upskilling the academic librarian community		
	Greece	Link: Not available	Relevance to the SRIA: GO1, SO2, OO3
Competence Centre	ICDI Competence Center is intended to bring together all the experiences gained over the years and within different initiatives on Open Science and FAIR principles, so that each actor can be both a user and service provider, making their own specific knowledge available or using those of others		
	Italy	Link: https://open-science.it/fr/article?rpk=160737	Relevance to the SRIA: GO1, SO1, OO1
Competence Centre	Developing high-level competence centres for skills development (including quantum, language technology, and HPC)		
	Latvia	Link: https://www.openaire.eu/os-latvia	Relevance to the SRIA: GO1, SO7, OO3
Stakeholder Platform	The national FAIR data roundtable is operating as the platform where stakeholders have started to exchange information on their programmes to implement good data stewardship practices and make data available for reuse and define steps to take together to realise a growing practice of Open Science in the years to come. Key actions centre around (1) capacity building and training in good data stewardship practices (2) actual FAIR implementation (3) FAIR-enabling services and infrastructure as well as the trust framework for access to sensitive (FAIR) data		
	The Netherlands	Link: Not available	Relevance to the SRIA: GO1, SO2, OO3
Open Science Training	The Research Council of Norway (RCN) has, together with the Dutch national funder NWO and the Leiden University research institution CWTS, developed a course on open science for case officers		
	Norway	Link: https://open-science.cwts.nl	Relevance to the SRIA: GO1, SO4, OO3

Data Management Training	The project Disciplinary Open Research Data Repositories has a training programme targeting (1) practical aspects of research data management such as the preparation of data for sharing in accordance with the requirements of research funding organisations, FAIR principles, and good practices (2) legal aspects of research data management and research data as the subject of legal regulations, including intellectual property law, General Data Protection Regulation, commercialisation of research results, and the use of free and open licences (Creative Commons and Open Data Commons)	
	Poland	Link: Not available	Relevance to the SRIA: GO1, SO4, OO3
Data Management MOOC	The University of Minho has developed an RDM Essential MOOC by request of the Secretary of State of the Ministry of Science, Technology, and Higher Education. This MOOC targets early-career researchers (particularly those benefiting from FCT funding) from Portuguese higher education institutions. This course is also targeted at all professionals who provide support in Research Data Management (such library and archive information professionals, IT specialists, and science and data managers)	
	Portugal	Link: https://www.openaire.eu/blogs/strengthening-research-data-management-practices-in-portugal	Relevance to the SRIA: GO1, SO4, OO3
User Support and Training	TRAP-RCUB IT offers support and training covering a range of Open Science-related topics beyond repository features and workflows. This is currently the training programme dedicated to Open Science in Serbia	
	Serbia	Link: Not available	Relevance to the SRIA: GO1, SO4, OO3
Open Science Training	Regular courses are offered to develop skills and competencies for Open Science, including open access publishing as well as infrastructure, data management, policy making, and advocacy for Open Science	
	Slovakia	Link: https://otvorenaveda.cvtisr.sk	Relevance to the SRIA: GO1, SO4, OO1
Data Management Support	National network for local units at Swedish higher education institutions, public research institutes and authorities. These units (Data Access Units or DAUs) assist researchers in research data management, aiming for data to become as accessible as possible, in accordance with the FAIR principles	
	Sweden	Link: https://snd.gu.se/en/about-us/snd-network	Relevance to the SRIA: GO3, SO1, OO1
E-learning Platform	The Open Course Platform has been developed to raise awareness of Open Science and related issues in Turkey, increase current knowledge, and support researchers' projects. There are many courses available, such as on using Aperta (Turkish Open Science Repository), responsible research, and evaluating open papers. Researchers are able register in the platform, follow courses, take exams, and receive a certificate if successful. Key components include: (1) Research Data Management Training (2) Open Science Handbook (3) Open Access (4) Responsible Research and Innovation (5) Open Peer Review (6) Open Citations (7) Text and Data Mining (8) Open and Reproducible Research	
	Turkey	Link: https://acikveri.ulakbim.gov.tr	Relevance to the SRIA: GO2, SO8, OO3

E-learning Platform	The Research Data Management Education Portal aims to provide a basic guide on the management of research data for researchers, project managers, funders and academic institutions working in Turkey. Within the scope of the portal, detailed information is provided about various elements such as the definition, preparation, processing, analysis, protection, access, and reuse of research data	
	Turkey	Link: https://acikveri.ulakbim.gov.tr	Relevance to the SRIA: GO2, SO8, OO3
National Open Science Plan	The National Open Science Plan (until 2030) has been developed by the Ministry of Education and Science of Ukraine with the help of stakeholder representatives and approved by the Ukrainian Government on 08 October 2022. Objective 6 aims to raise awareness on and building capacity in Open Science	
	Ukraine	Link: https://mon.gov.ua/eng/tag/mizhnarodni-naukovi-proekti	Relevance to the SRIA: GO1, SO1, OO3
Handbook on Open Science	The 'Open Science Practices' handbook for master students and PhD candidates (in Ukrainian) was created within the EU-funded Erasmus+ project OPTIMA ('Open Practices, Transparency and Integrity for Modern Academia') for academic courses to be taught in Ukrainian higher educational institutions from 2023	
	Ukraine	Link: https://lpnu.ua/optima/rezultaty-proiektu/d31-novi-navchalni-predemety-z-vidkrytoi-nauky-dlia-studentiv-mahistriv	Relevance to the SRIA: GO1, SO1, OO3

2.7   Best Practices Targeting 'Assessment'

Research Assessment	Open Science is included in research assessment in Latvia	
	Latvia	Link: Not available	Relevance to the SRIA: GO1, SO3, OO3
Recognition and Awards	NOR-CAM: A Toolbox for Recognition and Rewards in Academic Careers	
	Norway	Link: https://www.uhr.no/en/front-page-carousel/nor-cam-a-toolbox-for-recognition-and-rewards-in-academic-careers.5780.aspx	Relevance to the SRIA: GO1, SO3, OO3
National Open Science Plan	The National Open Science Plan (until 2030) has been developed by the Ministry of Education and Science of Ukraine with the help of stakeholder representatives and approved by the Ukrainian Government on 08 October 2022. Objective 5 aims to improve the quality assessment system of research and technical activities	
	Ukraine	Link: https://mon.gov.ua/eng/tag/mizhnarodni-naukovi-proekti	Relevance to the SRIA: GO2, SO3, OO4

2.8   Best Practices Targeting 'Engagement'

Citizen Science Activity	HELIX has been engaging in citizen science activities, in collaboration with Ellinogermaniki Agogi, targeting professors and students to promote data-dependent research conduct	
	Greece	Link: https://www.openaire.eu/hackquake	Relevance to the SRIA: GO1, SO1, OO3

Citizen Science Activity	The (Senior) Family Dog Programme is a scientific communication-focused project started in 1994. The programme is managed by the Department of Ethology of the Faculty of Science at the Eötvös Loránd University (ELTE) and is aimed at studying and understanding the behavioural and cognitive aspects of dog behaviour and the dog/human (dog/owner) relationship. Volunteering dog owners and family dogs (together with their owners) take part in tests creating diverse situations. There are no restrictions regarding the breed, age or skills (training level) of the dogs involved. The Senior Family Dog Project is a sub-project of the Family Dog Project (FDP)		
	Hungary	Link: https://kutyaetologia.elte.hu/tag/kutyaetologia	Relevance to the SRIA: GO2
Multidisciplinary Laboratory	The National Multidisciplinary Laboratory for Climate Change at the University of Pannonia is strengthening the scientific evidence base for climate change, and thus the attitudes towards eco-consciousness as well as dissemination of scientific results		
	Hungary	Link: https://eng.uni-pannon.hu	Relevance to the SRIA: GO3, SO7, OO3
Science Communication Platform	Science communication platform for citizen science		
	Latvia	Link: Not available	Relevance to the SRIA: GO3, SO8, OO1
Citizen Science Network	The Research Council of Norway (RCN) is establishing a national network for citizen science together with relevant institutions from research and the public sector to enhance mutual learning and sharing of experiences across institutions and societal sectors. RCN activities related to citizen science includes participation in the EU-funded project PRO Ethics that will develop a framework for ethically sound user involvement		
	Norway	Link: https://pro-ethics.eu	Relevance to the SRIA: GO1, SO1, OO4
Citizen Science Observatory	Citizen science observatory of the Spanish funding agency FECYT		
	Spain	Link: https://ciencia-ciudadana.es	Relevance to the SRIA: GO1, SO4, OO3
National Open Science Plan	The National Open Science Plan (until 2030) has been developed by the Ministry of Education and Science of Ukraine with the help of stakeholder representatives and approved by the Ukrainian Government on 08 October 2022. Objective 4 aims to popularise science, disseminate scientific knowledge, and involve citizens in research and technical activities		
	Ukraine	Link: https://mon.gov.ua/eng/tag/mizhnarodni-naukovi-proekti	Relevance to the SRIA: GO1, SO1, OO3
Academic Integrity and Open Science Surveys	Two national-level surveys were carried out in 2021 and 2022 (the third one is planned for 2023) to study the attitude of the Ukrainian academic community toward the values of academic integrity and Open Science practices. The questionnaires were developed and the data will be processed and made openly available in the EU-funded Erasmus+ project OPTIMA ('Open Practices, Transparency and Integrity for Modern Academia')		
	Ukraine	Link: https://lpnu.ua/en/optima/project-results/d42-conducting-complex-academic-integrity-and-os-surveys	Relevance to the SRIA: GO2, OO2

3 Conclusion

The EOSC Catalogue of Best Practices provides a non-exhaustive list of best practice use cases from across Europe. The use cases have been collected via the survey on National Contributions to EOSC 2021 conducted under the EOSC Future project and aimed at representatives of Member States and Associated Countries in the EOSC Steering Board. The catalogue offers an initial overview of some of the national activities and collective dedication towards EOSC and Open Science and will be updated on an annual basis.

The use cases have been categorised according to the eight categories that are relevant for EOSC and Open Science in the Monitoring Framework for National Contributions to EOSC for the EOSC Steering Board: Publications; Data; Software; Services; Infrastructure; Skills/Training; Assessment; Engagement. There is an overwhelming majority of data and infrastructure use cases, which follows on the priority of the EOSC Steering Board on monitoring EOSC readiness in the first survey on National Contributions to EOSC 2021, and which are essential for an operational EOSC and Open Science ecosystem in Europe.

It should be noted that the eight categories in the monitoring framework were not explicitly identified in the first survey for 2021 but have been fully incorporated into the second survey for 2022. This means that the second survey for 2022 will already include an initial set of use cases showcasing existing policies and practices for EOSC and Open Science. The second survey 2022 and the subsequent annual surveys will further add new uses cases to the repertoire of existing new cases. These use cases will be presented together with the data collected from the annual surveys in the online interactive EOSC Observatory [9]. All relevant documents and outputs related to the surveys will be archived in the EOSC Observatory Zenodo Community [10].

4 References

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