		EOSC-Nordic (Andreas Jaunsen, Mari Kleemola, Josefine Nordling)	EOSC-Pillar (Olivier Rouchon)	NI4OS-Europe (Elli Papadopoulou, Andreas Athenodorou)	ExPaNDs (Abigail McBirnie, Sophie Servan)	EOSC Synergy (Isabel Bernal, Gerard Coen)
11 May Pillar 1: Concepts for FAIR implementation						
Concepts for FAIR implementation (Pillar 1)	Rec. 1: define FAIR for implementation	Implementation of FAIR follows Wilkinson et al 2016 (https://doi.org/10.1038/sdata.2016.18). More specifically, assessments and recommendations follow the metrics defined in Devaraju et al. 2020 (https://doi.org/10.5281/zenodo.4081213). In deliverable D4.1 (https://doi.org/10.5281/zenodo.4045402) details on the initial assessments is provided, including FAIR recommendations. The team has hosted a number of webinar / hackathon events to support communities in implementing specific features. The webinar series on 'FAIRification' will continue, while past events is recorded and accessible on http://eosc-nordic.eu and on YouTube	D5.1 FAIR Research Data Management Tool set - first release 30 June 2020 D5.2 FAIR research Data Management Workbench Operation Report D5.6 Fair Research Data Management Tool set update (Month 24)	Implementation of FAIR is according to "The FAIR Guiding Principles for scientific data management and stewardship" by Wilkinson et al. Information on the FAIR uptake strategy of NI4OS-Europe are provided in the deliverable D6.1 "EOSC service and FAIR uptake strategy" which can be found on http://doi.org/10.5281/zenodo.3736152. Further information regarding FAIR implementation can be found in the deliverable D4.2 "Data repository integration and ORDM/FAIR compliance guidelines", https://doi.org/10.5281/zenodo.3736149 A lot of attentionn has also been given on training events and training people, as well as developing tools that would enable us to implement FAIR in a practical way. Also, NI4OS-Europe focuses on	Completed: D2.1 Draft extended data policy framework for Photon and Neutron RIs (Sep 2020) Available at; https://doi.org/10.5281/zenodo.4014811 T5.1.1 Workshop series to promote FAIR principles (Oct 2020) Info here; https://expands.eu/2020/09/09/expands-fair-workshops-1st-2nd-october-2020/ Recording of workshops available here (bottom of page): https://expands.eu/presentations/ Upcoming: D2.3 Final extended data policy framework for Photon and Neutron RIs (Aug 2021)	n/a

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	(https://www.youtube.com/channel/UCgoDT8ifg8olwcRpYWAUalg).		legal interoperability on the level of licenses for derivative works: License Clearance Tool that was developed addresses such challenges in the RDM lifecycle (https://wiki.ni4os.eu/index.php/License_Clearance_Tool_-_Description_and_Documentation)		
Rec. 2: Implement a model for FAIR digital objects	FAIR digital object model is implictly assumed in F-UJI assessment tool, but also provided as part of the FAIR recommendations (see, D4.1 https://doi.org/10.5281/zenodo.4045402). This is also covered in 1-on-1 support meetings with communties.Training is ongoing since 2019 (but independently of the EOSC-Nordic project) and by the end of 2020 a total of 160 persons in the Nordic+Baltic region have passed the 5-day course on 'FAIR data stewardship'.	WP5.1 and WP5.2 will deliver a pilot where data repositories from (some of) the use cases of the project are federated. It will use existing tools to proof the concept which will include the FAIR digital object concept and will deliver recommendations on integration of existing repo's. The work will be discussed and shared with other call 5b projects. The training component in Pillar will pick up the experience gathered in constructing the pilot and amplify the gained	Task T4.3 "Open and FAIR data in practice: tools for RDM following the data lifecycle" is focussing on this recommendation. This will lead to the deliverable D4.4 "Delivery of data management and certification tools" (type Demo) (July 2020) - IPR tool for digital objects. PID policy is being worked on (WP5), In addition we monitor FAIR Data Maturity Model and FAIRsFAIR work on FAIR-aligned services in order to prepare with developing FAIR-aligned tools and services in WP4.Further information regarding FAIR implementation can be found in the deliverable D4.2 "Data repository integration and ORDM/FAIR compliance	Completed: D2.2 Draft Recommendations for FAIR Photon and Neutron Data Management (Dec 2020) Available at: https://doi.org/10.5281/zenodo.4312825 T5.1.1 Workshop series to promote FAIR principles (Oct 2020) Info here: https://expands.eu/2020/09/09/expands-fair-workshops-1st-2nd-october-2020/ Recording of workshops available here (bottom of page); PIDs/DOIs for Data - Policy and Implementation- Best Practice Sharing Workshop (Jan 2021) for ExPaNDS/PaNOSC partner RIs; Future: D2.5 Advanced infrastructure for PIDs in Photon and Neutron RIs (Feb	D3.3 Intermediate report on technical framework for EOSC FAIR data principles implementation. Describes the evaluation of the recommendations for assessing data FAIRness and data repository features coming from FAIRsFAIR and provides details about architecture, requirements and a roadmap for implementation. http://dx.doi.org/10.20350/digitalCSIC/12608 D3.5 Final report on technical framework for EOSC FAIR data principles implementation. Implementation details for a technical framework to validate and monitor data FAIRness. Any change or

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		knowledge in its trainings.	guidelines", https://doi.org/10.5281/zenodo.3736149 Additionally, trainings that are delivered to national infrastructure and service providers include the PID systems available (PURL, Handle, DOI etc) and support is provided on integrations that have to do with Handle and DOI systems where NI4OS-Europe partners have capacity.	2022); D2.7 Final Recommendations for FAIR Photon and Neutron Data Management (May 2022)	addition to the information gathered in D3.3 will be reported. (Due Nov 2021)
Rec. 3: develop components of a FAIR ecosystem	This is primarily supported by the series of FAIRification events (presently STEP1-3), including testing and feature suggestions to the Wilkinson FAIR Evaluator and F-UJI assessment tool for a sample of ~100 data repositories, entirely relying on machine actionbility of (meta)data. During the project we will support FAIRification activities aimed towards service providers (e.g. recommendations to repositories on metadata,	WP4 will look at the status of policies in the participating countries and line them up with legal practices and procedures. This includes security, access, right of use policies.	D4.1 "Incentives for supporting ORDM and FAIR" https://doi.org/10.5281/zenodo.3736147 This deliverable describes the incentives and rewards that can be employed to improve the uptake of ORDM and FAIR in general as well as their integration in EOSC through country-tailored systems of rewards and incentives. D4.2 "Data repository integration and ORDM/FAIR compliance guidelines" https://doi.org/10.5281/zenodo.3736149.	Future: D2.4/8 (Active) DMPs for Photon and Neutron RIs (Nov 2021/Nov 2022)	D4.1 – Best Practices Elicitation including Data Management Plans http://dx.doi.org/10.20350/digitalCSIC/12609

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		hackathons + M4M if necessary). Results from the first epoch evaluations for FAIR Maturity was published in D4.1 https://doi.org/10.5281/zenodo.4045402 (Aug2020) and D4.3 (Feb2022).		This deliverable delivers the results of the analysis of guidelines for open science. In addition, focus is on machine actionability via eg RePol tool that attempts to create machine actionable repositories' policies (currently runs on beta version). Link to the tool: https://repol.ni4os.eu/. In terms of training activities, a National Summer school on Open Science is organized in Cyprus to present these tools and other NI4OS partners incorporate such events in their agendas locally.		
	Rec. 16: Apply FAIR broadly	We aim to introduce recommendations for FAIR services (in collaboration with WP3) and for data repositories (including publishing of code).	D5.4 FAIR-oriented research data management: Support, Training and Assessment Activity Report (1 of 2), 31 Dec 2020D5.4 FAIR-oriented research data management: Support, Training and Assessment Activity Report (2 of 2), 30 June 2022	Training the trainers programme focuses on Open and FAIR RDM; promoting those principles at the national level by the trainers is expected. Furthermore, NI4OS tries to foster policy adoption, incl. FAIR, in the context of the project's objective to set up National Open Science Cloud initiatives (NOSCIs) in the 15 countries of its partners. "A National Open Science Cloud Initiative (NOSCI) is	Completed: D2.2 Draft Recommendations for FAIR Photon and Neutron Data Management (Dec 2020) Available at: https://doi.org/10.5281/zenodo.4312825 T5.1.1 Workshop series to promote FAIR principles (Oct 2020) Info here: https://expands.eu/2020/09/09/expands-fair-workshops-1st-2nd-october-2020/ Recording of workshops available here (bottom of	Working with FAIRsFAIR to see where the overlap is between Software-QA and Service-QA and what that means for FAIR. Not an expressed task but happening as part of collaboration activities.

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				envisaged as a coalition of national organizations that have a prominent role and interest in the Europe Open Science Cloud (EOSC). The main aim of NOSCI will be the promotion of synergies at national level, and the optimization/articulation of their participation to European and global challenges in this field of Open Science, including the EOSC. National initiatives are envisaged to play a prominent role in Member States and Associated Countries and facilitate EOSC governance."	page); Future: Symposium for Librarians and Data Managers (Sep 2021); D2.7 Final Recommendations for FAIR Photon and Neutron Data Management (May 2022)	
	Rec. 17: Align and harmonise FAIR and Open data policy	Harmonising policies in the region and FAIR incentives is on the agenda of WP4 and the activity started up in January 2021. An interview study across disciplines and nations in the region will be exectued in the coming 6 months to gain insight into the mechanisms supporting FAIR uptake (incentives). The ambition is to deliver a	WP4.1 will ascertain requirements for open data, data protection and cross border data access with the FAIR and Landscaping TF, and establish boundaries for the legal interoperability of data. The result will be an legal and Policy framework and federation blueprint, December 2020 with to the region covered by	WP2 works on buidling national OSC initiatives aiming at stimulating discussions regarding national research settings and EOSC policies (incl FAIR) taking stock of OpenAIRE NOADs experience and resources that facilitate policy alignment. FAIR are key components to suggestions made in deliverable D2.2 NI4OS-Europe National OSC initiatives models and in discussions, also as topics	Completed: D2.1 Draft extended data policy framework for Photon and Neutron RIs (Sep 2020) Available at; https://doi.org/10.5281/zenodo.4014811 Upcoming: D2.3 Final extended data policy framework for Photon and Neutron RIs (Aug 2021)	Looking at the SLAs in place for service providers related to data sharing, storage and transfer - making sure DMPs are available. Looking at the AAI policies in place and defining changes which might be reccomended to improve/allow transnational data sharing by service providers.

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	report (D4.4, due May 2022) with recommendations on harmonising and empowering the Open Science efforts in the region.	Pillar (IT, DE, FR, BE, AT)	that could be collaboratively tackled via potential Task Forces created under NOSCIs (https://zenodo.org/record/4061801#.YJsEX7UzY2x).		
19 May Pillar 2: FAIR culture					
Rec. 4: Develop interoperability frameworks	This recommendation is supported through the use of the Wilkinson et al. 2019 / Devaraju et al 2020 evaluation indicators, which has a strong focus on interoperability via use of a number of machine-actionable metadata related to knowledge representation and FAIR vocabularies. Detailed in D4.1 https://doi.org/10.5281/zenodo.4045402 (Aug2020) and D4.3 (Feb2022).**Updated**	See Rec. 2	Will elaborate on publishing and harvesting repository metadata in a form that could be used to catalogue them.D3.1 Best practices for on-boarding and related policies: https://zenodo.org/record/3736143#.Xrna0Wgzbc8 NI4OS-Europe has set up a team of experts on interoperability issues, semantic data as well as ontological solutions in order to support interoperability in certain scientific domains. The team will work on creating best practices to be used towards this direction. Additionally, NI4OS-Europe called experts on data standards and created a team that can guide service providers, provide necessary	Completed: D2.2 Draft Recommendations for FAIR Photon and Neutron Data Management (Dec 2020) Available at: https://doi.org/10.5281/zenodo.4312825 D3.1 Report on status, gap analysis and roadmap towards harmonised and federated metadata catalogues for EU national Photon and Neutron RIs (Oct 2020) Available at: https://doi.org/10.5281/zenodo.4146819 Future: D2.7 Final Recommendations for FAIR Photon and Neutron Data Management (May 2022); D3.2 Release V1.0 ExPaNDS ontology available as an EOSC online service	n/a

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Rec. 5: Ensure data management via DMPs	Not an activity in our WP, but one use-case in WP5 on DMPs	N/A	services around interoperability, support data exchange in different disciplines. Supporting the long tail of science: first part of the project focussed on identifying services from different disciplines, identifying gaps. Set up teams of experts on these topics, creating best practices on scientific topics. Have produced best practices for onboarding. More in the next six months.**Updated** Promoting generation and publication of machine-actionable DMP outputs via Argos (machine actionable tool, applies RDA maDMPs common global standard and provides versioning, publishing and assigning DOIs to DMPs); contributing to enhancing the Argos tool with standards used in the region D4.5 Delivery of legal, technical and procedural tools (type Demo), (November 2020)D4.7 Second set legal, technical and procedural tools (type Demo), (November	https://doi.org/10.5281/zenodo.4806026 **Updated** Future: D2.4/8 (Active) DMPs for Photon and Neutron RIs (Nov 2021/Nov 2022)	D4.1 – Best Practices Elicitation including Data Management Plans http://dx.doi.org/10.20350/digitalCSIC/12609 **Updated**

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Rec. 6: recognise & reward FAIR data & stewardship	Incentives are mapped and innovated for FAIR uptake in T4.3 (started Jan 2021) and will be detailed in D4.4 and recommendations on FAIR incentives and expected impacts in the Nordics, Baltics and EOSC (Apr2022). The FAIR assessments are themselves apparently an incentive to FAIRify data for some of the repositories in our sample. NeIC (EOSC-Nordic coordinator) has provided FAIR data stewardship training to 160+ individuals in the region to enable skill developments in the hope that institutions will support culture changes on data stewardship and		2021)Training events about RDM and DMPs have been organized, also in collboration with EOSC Hub. Enhancing training in the next couple of months. Approach is through training in DMPs.**Updated** D4.1 Incentives for supporting ORDM and FAIR, https://zenodo.org/record/3736148#.XoYMfIgzY2w; FAIR data and stewardship rewards will also be tackled by the WP2 national open science initiatives. In this respect, national open science initiatives that have a more strategic role and their tasks include drafting/ influencing (that depends on how they are structured and operate as bottom up or top down initiatives - or hybrid even) Open Science and RDM policies and national plans that incorporate incentives and rewards based on what the global OS community follows. Deliverable 2.2 NI4OS-Europe National OSC initiatives models has some examples in the blueprint it		n/a

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		FAIR in general. **Updated**		proposes https://doi.org/10.5281/zenodo.4061801 **Updated**		
	Rec. 18: Cost data management	NA	N/A	Training on Open and FAIR RDM also focuses on two aspects of RDM costs: a. from the researchers point of view and how they can calculate costs following the different steps of a data management lifecycle, and b. from the institutions/ providers point of view and how they can calculate the costs to build curation services	Completed: D2.1 Draft extended data policy framework for Photon and Neutron RIs (Sep 2020) Available at https://doi.org/10.5281/zenodo.4014811; Upcoming: D2.3 Final extended data policy framework for Photon and Neutron RIs (Aug 2021); Future: D2.4 DMPs for Photon and Neutron RIs (Nov 2021) **Updated**	n/a
	Rec. 19: Select and prioritise FAIR digital objects	We strongly recommend the FAIR Digital Object concept to the repositories in our sample (98) and it is indirectly expected/rewarded in FAIR assessment tools such as F-UJI (Devaraju et al.) and FDS (Wilkinson et al.). **Updated**	Pillar is considering implementing FDO concepts for its Federated Data Space		T5.1.1 Workshop series to promote FAIR principles (Oct 2020) Info here: https://expands.eu/2020/09/09/expands-fair-workshops-1st-2nd-october-2020 Recording of workshops available here (bottom of page); Future: Symposium for Librarians and Data Managers (Sep 2021); also Completed: D2.1 Draft extended data policy framework for Photon and Neutron RIs (Sep 2020)	n/a

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					Available at; https://doi.org/10.5281/zenodo.4014811 Upcoming: D2.3 Final extended data policy framework for Photon and Neutron RIs (Aug 2021) **Updated**	
	Rec. 20: Deposit in Trusted Digital Repositories	Currently supporting repositories in considering CTS certification or self-assessment against CTS requirements, pending on the maturity and needs of repositories. Results will be published in D4.5 "Implementation of certifications and data standards" (August 2022) **Updated**	Long term preservation of the datasets collected as part of the use cases will be done in a eTDR	One of the goals of the project is to certify specific processes of RDM. Within the work of WP4 and WP5 best practices for repositories are examined. Another objective is to onboard repositories. In discussions with repository managers we inform about the FAIR principles including CTS. UoB is preparing a CTS application for one of the repositories onboarded by NI4OS (DAIS) with expert support, provided also through the SSHOC project. They are willing to share experience (especially if they manage to get certified by the end of the project) and prepare a brief list of recommendations, as part of WP4 activities. **Updated**	Future: D3.3 Demonstrate ICAT and SciCat released with APIs compatible to ExPaNDs (Feb 2022)	List of the repositories engaged in the work of EOSC Synergy: https://github.com/EOSC-synergy (CTS certification is not planned as part of the project work but some repositories will engage with this work via FAIRsFAIR and independently)

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	Rec. 21: Incentivise reuse of FAIR outputs	Will also be addressed to some extent in: D4.4 Policies and incentives, D4.3 FAIR uptake		D4.1 Incentives for supporting ORDM and FAIR, https://zenodo.org/record/3736148#.XoYMfIgzY2w D2.2 : National OSC initiatives models (due August 2020). The NI4OS-Europe training catalogue collects resources that makes available to everyone. Resources can be reused and they can also feed into the EOSC training catalogue once it is ready. **Updated**	federated EOSC services	n/a
20 May Pillar 3: FAIR Ecosystem						
FAIR ecosystem (Pillar 3)	Rec. 7: support semantic technologies	The F-UJI evaluator used for FAIR assessments of about 100 repositories is testing for 7 different metadata standards or formats (semantics), so these are supported indirectly via this activity (T4.1.2 FAIR Gap Analysis). Deliverable D4.2 'Implementation plan for the adoption of data standards and certification schemas' (submitted to the commission) details the task working plan. Task	WP5.5 will gather types of ontologies in use which can be used as a step stone towards machine actionable metadata for FDO.	NI4OS-Europe will use existing semantic shemas. Advisory support is provided to repositories and good practices are promoted. Inspired by the EOSC Nordic FAIR assessmneta and will start F-UJI assessments on data FAIRness in repositories. Also, for their interoperability, NI4SO adopts the OpenAIRE guidelines .	Future: D3.2 Release V1.0 ExPaNDS ontology available as an EOSC online service (May 2021)	Alignment of policies to the European Interoperability Framework (EIF). Not a specific task or project focus. D2.3 – Intermediate report on integration efforts – Lead: CSIC D2.4 - Final report on EOSC integration – Lead: IISAS

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Rec. 8: Facilitate automated processing	4.2.2 'Support for adoption of FAIR data standards' is a dedicated sub-task to support repositories with FAIR implementation. The communities are offered an interview and based on FAIR assessment, advice on FAIRification is provided incl. recommended use of data standards such as schema.org, DC, Datacite, DCAT and more. Supported by testing and regular active use of the F-UJI evaluator that is fully automated using machine-actionability.	WP7 will implement workflows using VRE	WP4 will facilitate automation processes through the development of the tools. D4.5 Delivery of legal, technical and procedural tools (type Demo), (November 2020), potentially D4.7 D4.7 Second set legal, technical and procedural tools(type Demo), (November 2021). A categorisation of contemporary tools supporting FAIR and ORDM, applicable at the strategic, operational or technical level is provided in the deliverable D4.3 "Mapping of legal, technical and	Future: D4.5 Deployment of Analysis Services for EOSC (Dec 2022)	M3.6 – Software QA-as-a-Service allows to plug-in generic software for CI/CD. Automated pipelines for adding Software and Services to the EOSC - this should respect FAIR and RoP. (To be possible for generic software & services by the end of 2021) Link to the documentation for the Software Quality Assurance pipeline: https://indigo-dc.github.io/jenkins-pipeline-library/release/2.1.0/index.html

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Rec. 9: Certify FAIR services	Support for self-assessments and ceritification of data repositories according to CTS is a central activity (T4.2.3) in the project and process and results will be detailed in D4.5 'Report on completed FAIR data standard adoption and certifications of data repositories in the region' (Aug 2022). Candidate repositories were selected in T4.2.1 (May-June 2020) using, for example, results from the FAIR evaluation. There are currenty (May 2021) ten repositories in the support program, the goals vary: some aim at FAIRification of metadata records, others self-assess against CoreTrustSeal	Services delivered as part of the project will stick to the FAIR recommendations. However, the certification of FAIR services is not matur enough to be in scope.	procedural tools", http://doi.org/10.5281/zenodo.3820880 Overall, emphasis on provided support rather than on assessing services. Training for Open and FAIR RDM (WP4) and for onboarding (WP5) includes presentation and walk through the specifics of the CoreTrustSeal certification. Repositories to be onboarded in the NI4OS-Europe countries will have the opportunity to learn about the process and prepare for obtaining a certification if they decide to do so. Also, tools/services to be produced in WP4 already take into consideration FAIRsFAIR reports and deliverables about FAIR-aligned repositories and services. Potentially D3.2 First report on pre-production environment (https://zenodo.org/record/3932925#.YKv8QKgzY2x), D3.5 Final report on pre-production environment (in 2022) For FAIR assessment, please	Future: D2.6 Self-evaluation Photon and Neutron RIs for FAIR data certification (Aug 2022)	Whitepaper: State of the art regarding digital badge issuing technologies: https://digital.csic.es/handle/10261/206348 M3.4 – Badge issuing (for Software & Service Quality Assurance) - linked to but not focused on FAIRness Assessment.

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		requirements, and some plan to apply for CoreTrustSeal certification. In autumn 2021, we plan to test the CTS+FAIR approach (as proosed by FAIRsFAIR) with 1-2 already certified Nordic/Baltic repositories.		also consult: https://zenodo.org/record/4486280#.YKzTbagzY2w		
	Rec. 22: Use information held in DMPs	NA	N/A	NI4OS-Europe DMP has been produced in deliverable D1.14 "Data Management Plan"	Future: D2.8 Active DMPs for Photon and Neutron RIs (Nov 2022)	Giving some process guidance for developing DMPs for services joining the EOSC. D4.1 – Best Practices Elicitation including Data Management Plans. -> Deliverable focusing on work with thematic services to employ data management plans as part of the project. (link shared above in Pillar 1)
	Rec. 23: Develop components to meet research needs	NA	See Rec. 1		Future: D3.3 Demonstrate ICAT and SciCat released with APIs compatible to ExPaNDs (Feb 2022)	See Rec 9.
	Rec. 24: Incentivise research infrastructures to support FAIR data	T4.3 'Incentives for the uptake of FAIR practices' will map and identify effective incentives for various stakeholders via qualitative studies, with the aim to develop and	A federated data space incitivise the uptake of additional data spaces and will connect data islands.	Through training events in the region. https://training.ni4os.eu/	federated EOSC services; Future: Symposium for Librarians and Data Managers (Sep 2021)	See Rec 9. - Badging provides recognition.

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		promote new and or effective incentives. We will also engage with relevant stakeholders and policy makers in order to hopefully achieve policy harmonisaiton in the region. Activity started early 2021 and culminates in D4.4 'Report and recommendations on FAIR incentives and expected impacts in the Nordics, Baltics and EOSC' (April 2022).				
18 May Pillar 4: Skills for FAIR				Yes		
Skills for FAIR (Pillar 4)	Rec. 10: Professionalise data science & stewardship roles	NeIC (project coordinator) has initiated a regional series of data stewardship courses as of 2018 (held by GO-FAIR trainers) to build consistent data stewardship competence throughout the region. Presently, 160+ individuals in the region have completed the course. In WP4 we have conducted a series of		Through training activities and dissemination events of the project with a total of 600 persons targeted. NI4O-Europe targets All the relevant information can be found on our training plan published on the deliverable D6.2 Training plan (https://zenodo.org/record/3736155#.XqiT725uLkW). In addition, WP2 that consults NI4OS-Europe partners and builds a blueprint for creating	D5.1 Annual report on training activities (Aug 2020, 2021, 2022) https://doi.org/10.5281/zenodo.4468982	EOSC SYNERGY WP6 is currently working on preparing a set of modules about different issues of data science and EOSC to be promoted in universities in EOSC SYNERGY partner countries and beyond. The new learning environment developed by the project is available here: https://learn.eosc-synergy.eu/ Users may browse existing courses prepared by ESOC

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	webinars (FAIRification 101), somewhat technical in nature, each session focusing on different aspects of the implementation of FAIR (https://www.eosc-nordic.eu/fairification-step-2-on-data-metadata-webinar/) **Updated**		national open science initiatives, includes provisions for implementing education and training frameworks in the countries. However, how/if/in which extent they will be implemented at the national level depends on the diversity of national settings and on the priorities set in national roadmaps. There is a strong training agenda on skills for FAIR for service providers (thematic and repository).		SYNERGY members and also create their own course. Early this year we also started work to prepare modules about EOSC and relevant related tools/resources by EOSC SYNERGY consortium to be promoted in Universitites that run or plan to run programmes on Data Science. The programme in preparation will be composed of several modules and will be targeting universities in EOSC SYNERGY countries and beyond. **Updated**
Rec. 11: Implement curriculum frameworks and training		D5.3 Training Plan (Dec 2019)	The project supports Training of Partners and creation of training material to be translated to the partners' languages for Fairness. The material will be based on existing training material/guidelines transformed to meet stakeholders' needs according to the project's stakeholders' survey findings. Train the trainer events of NI4OS-Europe: 1. FAIR data and principles (Debrecen), 19 - 20 February 2020, link:	Completed: PaNOSC and ExPaNDS internal workshop series 'Train the Trainers' - workshop on creating courses on the PaN training portal (Feb/Mar 2021) Future: D5.4 Demonstrator for using of e-learning platforms (Sep 2021); D5.5 Dedicated websites and e-platforms with the teaching material (Aug 2022); D5.6 Report on lessons learned and future prospects for adopting best practices on data FAIR principles, data management and data	WP6 working in 2021 on preparing a dataScience programme for Universities in EOSC SYNERGY partner countries **Updated**

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			https://events.ni4os.eu/event/4/ 2. National EOSC promotion (UCY), 16 – 17 March 2020, link: https://events.ni4os.eu/event/5/ 3. ORDM (ATHENA), 5 – 6 May 2020, link: https://events.ni4os.eu/event/7/ 4. Onboarding (IPB and GRNET), 3 – 4 June, 2020: https://events.ni4os.eu/event/9/, 5. How to host a Successful Virtual Event, 31 August 2020, link: https://events.ni4os.eu/event/18/, 6. IT Service Management (UKIM), 15 – 16, September 2020, link: https://events.ni4os.eu/event/19/, 7, An introduction to domain specific Data Management Plans, 27 January 2021, link: https://events.ni4os.eu/event/35/ **Updated**	stewardship at the ExPaNDs RIs (Jan 2023) **Updated**	
12 May Pillar 5: Incentives and					

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metrics for FAIR data and services						
Incentives and metrics for FAIR data and services (Pillar 5)	Rec. 12: Develop metrics for FAIR digital output	Evaluation of repository FAIRness is achieved by averaging N=10 datasets from the respective repository. More than 100 repositories are continuously being evaluated, with the ambition to detect any potential increase in FAIRness levels over time, partly as a result of a series of FAIRification webinars provided by the project, but also certification support (or self-assessment against CTS). **Project has contributed to the extensive testing and mutliple improvements of the FAIR Maturity evalautor tool (started out with using the M. Wilkinson tool (Wilkinson et al 2016: https://doi.org/10.1038/sdata.2016.18),**	Together with the call5b an initiative to define metrics (indicators) which include indicators on implementation of FAIR for continous monitoring has been started.	D4.3 has identified studies, frameworks and tools that propose and/ or make use of FAIR metrics. FAIR Maturity Model is also guiding practices in that area and service providers will be informed about all possible solutions for assessing FAIRness and will be provided with support within WP3, 4 and 5 should they are willing to implement them.	Completed: **D2.2 Draft Recommendations for FAIR Photon and Neutron Data Management (Dec 2020) Available at: https://doi.org/10.5281/zenodo.4312825** uses the prioritisation indicators from the RDA FAIR Maturity Model to priorities metadata to be collected for FAIR across the PaN experimental lifecycle **updated**	

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	but later moved entirely over to using the F-UJI tool), including harvester and many of the indicators. Details are provided in D4.1 1 An assessment of FAIR-uptake among regional digital repositories: https://doi.org/10.5281/zenodo.4045402 (Aug 2020) and D4.3 Report on Nordic repositories and their uptake of FAIR (Feb 2022). **updated**				
Rec. 13: Develop metrics to certify FAIR services	WP3 has developed a Service Maturity framework, but the FAIR aspect was left to a minimum due to other initatives taking this aspect up in more detail and the idea was that they could pick up on the work of others, if needed. Addressed FAIR in one question: "Service provider has analyzed "FAIRness" of the	N/A	D4.3 has identified studies, frameworks and tools that propose and/ or make use of FAIR metrics, including for repositories. Moreover, for the needs of new tools to be developed in WP4, FAIRsFAIR report is taken into consideration so that they are designed from scratch as FAIR-enabled tools/services.	**Future: D2.6 Self-evaluation Photon and Neutron RIs for FAIR data certification (Aug 2022)**	within the framework of EOSC SYNERGY we are developing an automated FAIR Evaluator tool for multidisciplinary repositories. It is being tested with DIGITAL.CSIC and will be made available for use for DSPACE and other software based repositories. The tool will be integrated into EOSC SYNERGY Software and ServicesQuality as a Service process. More details at https://indico.desy.de/event/29297/contributions/99594/atta

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		service. " **Updated**				chments/64973/80301/EOSC-Synergy-SQAaaS-Expands-Workshop-Apr-2021.pdf **Updated**
	Rec. 25: Implement and monitor metrics	Assessments and recommendations follow the metrics defined in Devaraju et al. 2020 (https://doi.org/10.5281/zenodo.4081213) i.e. the F-UJI tool. The project is monitoring the evolution of those metrics among 100+ repositories in the region and will monitor the progress of these over a time period of 2 years. However, we have noticed that the repositories have not increased their FAIRness level that much. So the project has now decided to revitalise the outreach activity by introducing a number of new activities to take a more active approach towards the individual repositories in the hope that this will lead to more action. We will e.g.: inform	Pillar together with 5b projects work on metrics to be rolled out in National initiatives - this includes metrics related to FAIR	Metrics derived from onboarded services and repositories will be monitored at the pre-production platform before fed to EOSC.	**Completed: D2.1 Draft extended data policy framework for Photon and Neutron RIs (Sep 2020) Available at;** **https://doi.org/10.5281/zenodo.4014811** Upcoming: D2.3 Final extended data policy framework for Photon and Neutron RIs (Aug 2021) - the reason this work is mentioned here is that one element of the data policy framework relates to the monitoring of FAIR, including regular audits on compliance to FAIR data. **Updated**	

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	Rec. 26: Support data citation and next generation metrics	communities about the recent score for their repositories, summarise recommended actions/issues in a written document, based on info provided in individual meetings and offer 1-on-1 meeting to all remaining communities. Updated Next generation metrics; assuming the testing of rich community specific metadata is one such 'next gen' metric, then we are testing and exloring support for this via the F-UJI tool for our sample of repositories. We expect to host a FAIRification STEP4 event after summer on this topic. Updated	N/A		Completed: T5.1.1 Workshop series to promote FAIR principles (Oct 2020) Info here: **https://expands.eu/2020/09/09/expands-fair-workshops-1st-2nd-october-2020/** Recording of workshops available here (bottom of page) - workshop 1 specifically looked at the issue of data citation and how it can be encouraged/supported; PIDs/DOIs for Data - Policy and Implementation- Best Practice Sharing Workshop (Jan 2021) for ExPaNDS/PaNOSC partner RIs - inlcuded a presentation on how to support the citation of data Future: Symposium	

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					for Librarians and Data Managers (Sep 2021) - one topic of the symposium is how to better bring together publications and data, including through citation **Updated**	
21 May Pillar 6: Investment in FAIR						
Invest ment in FAIR (Pillar 6)	Rec. 14: Provide strategic and coordinated funding	The project does not provide direct funding but project activities like certification and FAIR support and guidance will result in better practices and enable the reseach community and repositories to fulfil and align with funders' requirements better. The goal is also to help repositories/services to become more sustainable by improving their practices.	The project has funds to support applicable use cases of new services with integration into EOSC. The applicants will be selected through an open call. At the time the selection criteria for the applicants are not yet defined but will contain requirements regarding FAIRness of the proposed service candidate.	Strategic and corrdinated funding will be covered in business plan as well as sustainability plan. Regarding Business Plan, there is a particular task focussing on such aspects, namely T2.4 "Business Models" which is expected to deliver D2.5 "Business model for reccomentations" by October 2021. In addition, task 7.4 "Innovation management and sustainability" with final results presented in the deliverable D7.7 "Sustainability Report" which is expected to be delivered by August 2022.	Completed: D1.7 Sustainability policy report (Mar 2020) Available at: https://doi.org/10.5281/zenod o.3715279 detailing, for each ExPaNDs output, what existing standard / initiatives / services we should build on. Completed: D1.10 Project Data Management Plan (Feb 2020) available at: https://doi.org/10.5281/zenod o.3672926 with a short chapter on the allocation of resources.	There is no strategic funding provided from the project but the consortium has been constructed to include disciplines which were until now not well integrated in the EOSC. This is part of the expanding capacity and capabilities objective of the project and there are a number of service providers from the Environment, Earth Observation, Astrophysics and Biomedicine. Here is a list of the repositories of the services which are engaged in the federation work: https://github.com/EOSC-synergy n/a
	Rec. 15: provide sustainable funding	See above. Similar to FAIRsFAIR, the activities cover support for FAIRness and certification of	WP4.5 investigates models for funding in the different participating countries	T7.4 Innovation management and sustainability. This leads to two deliverables, D7.2 "Marketing, dissemination and sustainability plan",	Completed: D1.7 Sustainability policy report (Mar 2020) Available at: https://doi.org/10.5281/zenod o.3715279 explaining how we	

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		repositories that can enhance the FAIR data ecosystem and its sustainability. The webinars and training events will increase the awareness of data stewardship skills and needs. D4.1 An assessment of FAIR-uptake among regional digital repositories: https://doi.org/10.5281/zenodo.4045402 (Aug 2020) and D4.3 Report on Nordic repositories and their uptake of FAIR (Feb 2022).	and will deliver lessons learnt.	https://zenodo.org/record/3736165#.XrR7bKgzY2x (November 2019) as well as D7.7 "Sustainability Report" (M36). Cost-benefit analysis (cf Action 15.2) in the context of the national open science cloud initiatives, some partners are working on these with their ministries, so it is performed at national rather than project level.	want to make ExPaNDS outputs indispensable to our facilities (and their sustainable funding). Completed: D2.1 Draft extended data policy framework for Photon and Neutron RIs (Sep 2020) Available at: https://doi.org/10.5281/zenodo.4014811 that enables indirect strategic funding for FAIR to be included in the facilities data policy.	
	Rec. 27: Open EOSC to all providers but ensure services are FAIR	The EOSC-Nordic's FAIR efforts revolve around the broad adoption of FAIR and aspects of TRUST. In practice WP4 provides FAIRification and certification support to data repositories, connecting with data providers in the region to encourage and aid them to FAIRify the data. More mature repositiories with a long-term mission, in	Assesment of FAIRness of services is the next step - currently main objective is inclusion to EOSC catalogue.	Gradual migration of regional services and repositories towards EOSC with focus on FAIRness. Deliverable D3.2 "First report on pre-production environment" (https://zenodo.org/record/3932925#.YKzb4KgzY2x), Delverable D3.5 "Final report on pre-production environment" (April 2020)	Future: D4.5 Deployment of Analysis Services for EOSC (Dec 2022)	D2.3 Intermediate report on integration efforts. This report will provide information on the implementation status of Integration Plan. (Q4, 2020) Related milestone report: https://digital.csic.es/bitstream/10261/234120/1/EOSC-SYNERGY-Ms6.pdf <- Note that the integration efforts and related efforts in enabling FAIRs have not yet reached a point of overlapping.

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	particular those that also curate data, are prime candidates for CTS certification. The detailed actions are detailed in D4.1 https://doi.org/10.5281/zenodo.4045402				D2.4 Final report on EOSC integration. This report will be a valuable "Handbook" on how to integrate national clouds, thematic resources, and data repositories conformant to common quality standards, and harmonized in terms technological, policy, and legal aspects. (Q1, 2022)