

		FAIR champions (Isabel Bernal)	FAIR champions (Maria Jonsson)	FAIR champions (Mark Allen)	FAIR champions (Andreas Rauber)	
FAIR ecosystem (Pillar 3)	Rec. 7: support semantic technologies	Change of several discipline specific controlled vocabularies/terminologies including COAR Vocabularies, Fulltext, DataCite controlled lists and recommendations to use subject hierarchies with well-represented LOI. Ongoing implementation of SDOHLS standard.		The International Virtual Observatory Alliance (IVOA) has a Semantic Working Group that has produced 4 standards that are used for interoperability of astronomy data and services. http://www.ivoa.net (releases/terminology). This includes content descriptors and a framework for vocabularies, as well as a standard on units that is not limited to astronomy. These Semantic standards are implemented at some level of all services in the IVOA registry (and are available also via EDSIT. The IVOA WG is a first step to inclusion of the operational VO framework into EDSIT.		
	Rec. 8: Facilitate automated processing	DAI/PIB and SWORD and metadata exports into several formats supported so as to facilitate harvesting and aggregation.				
	Rec. 9: Certify FAIR services	Ongoing. It is important to harmonize across all existing certification options in order to avoid duplication and to focus those on verifiable resources. Along with FAIR services certifications, other significant certifications are emerging which are important for resources that also hold other types of outputs (eg Plan 5 requirements for repositories).			The importance and usefulness of CoreTrustSeal certification is becoming more visible in the field of astronomy. The CORE (http://core.trust.seal.io) has been certified and we advertise the fact that it was useful to do so. However it fails in with describing our own processes, and also because it helps us communicate and fit into the wider data sharing community.	
	Rec. 22: Use information held in DMPs	Under evaluation.	RDA has two working groups on DMP: "Expanding Data Management Plans (DMP) and "DMP Common Standards WG". The working groups will arrange a RDA Workshop on machine-readable DMPs on 26-27 May 2020. The Expanding Data Management Plans WG states that they will build up a catalogue of use cases, which I think is very much needed right now. As many universities have DMP systems today, it would be very interesting to see how DMP might be implemented and used in these kind of systems, maybe across cases in different countries.			
Rec. 23: Develop components to meet research needs	Hands on and online training provided to CSC community researchers and support staff, including data stewards and data scientists on a regular basis, as well as training for research data management. Current treatment in different thematic research infrastructures to cater meet domain specific, needs and how institutional services may further develop.					
Rec. 24: Incentivise research infrastructures to support FAIR data	Properly estimating the cost of FAIR services is a major concern and related recommendations should be a priority. Such estimation has to cover short term and long term services, which is challenging in a constantly changing landscape.					
Skills for FAIR (Pillar 4)	Rec. 10: Professionalise data science & stewardship roles	Institutional training programme dedicated to data management issues since 2015 in the institutional repository space. The training can be hands on for archivists and online and targeted different professional communities including researchers, research project managers, librarians working in data science, staff and several departments such as Environmental and Energy, Legal departments etc. Research data management is entering the portfolio of libraries services at CSC. In addition, CSC entered the first relevant national Master in Data Science when it was awarded a grant from the Swedish Research Council for 2 years ago and courses cover aspects related to infrastructure building, data mining and other computing techniques, as well as other aspects including policies, data resources, standards and good practices, legal issues etc. In general, the view is one of the most fruitful and productive across institutions and disciplinary communities. There are not and not defined attempts to create specific curricula, there are not and not defined attempts to create specific curricula, there are not and not defined attempts to create specific curricula. One solution to highlight the different roles and professions emerging in the data management universe would be useful to show the variety and the many paths that can be pursued.	The research data management consortium "Swedish National Data Service" in Sweden is organizing different types of training in RDM for its members, see https://www.sns.se/en/education . Research Data Science PICM has a working group focused on training, see https://www.rdm-science.org/ .	In Astronomy data science professional, stewardship roles are less prominent, but there is the opportunity with FAIR/EDSIT/Open Science to make this more visible and recognized. There is activity at the level of Librarians and Information Services in Astronomy (LISA) with a conference planned in 2021 (development from 2020). Also there are national networks of astronomy librarians with an associated community call for FAIR services (LISA - http://www.ivoa.net/infrastructure.html including principles and links to the series of conferences going back ~10 years by particular the most recent event in 2017: http://info.astro.universityoftwente.nl/astrolib2017).		
	Rec. 11: Implement curriculum frameworks and training	In addition to ongoing initiatives to advance curriculum frameworks, OERs, professional networks, official accreditation we need more sustainable discovery tools, pathways and/or dedicated portals that facilitate awareness about existing opportunities and resources. There are good resources for specific domain areas and specific professional profiles but more can be done to reach such as an internet gateway.				
Incentives and metrics for FAIR data and services (Pillar 5)	Rec. 12: Develop metrics for FAIR digital output					
	Rec. 13: Develop metrics to certify FAIR services					
	Rec. 25: Implement and monitor metrics					
Investment in FAIR (Pillar 6)	Rec. 26: Support data citation and next generation metrics				RDA WG on Dynamic Data citation is compiling a report on implementation of its recommendations to support precise identification and citation of activity within its thematic data. To complement the on-going documentation during the plenary sessions and webinars.	
	Rec. 14: Provide strategic and coordinated funding	Providing funding that goes beyond the duration of projects is essential to maintain services such as ontologies and metadata schemes. Lack of enough funding has been identified as a major sustainability problem for many controlled vocabularies, as IROD reported in the previous year in a supplemental funding https://www.ivoa.net/documents/2020-2021-research-management . Proper allocation of funding may come from collaborative initiatives amongst controlled vocabularies/institutions/research institutions/related services. An example may be the recent online https://doi.org/10.26434/chemrxiv-2020-08-01 workshop on research infrastructure-related services. An example may be the recent online https://doi.org/10.26434/chemrxiv-2020-08-01 workshop on research infrastructure-related services. Research etc. Some well known examples for the latter are: https://www.ivoa.net/documents/2020-2021-research-management and other more recent ones such as FAIR4Energy, sustainability issues may also be addressed by interlinking collaborations amongst such repositories and amongst controlled vocabularies that are looking into the same professional activities. Also sustainability issues may be partially addressed by providing training and professional competence. Creating an ontology of a thematic domain specific semantic knowledge to be used and that is already used and maintained. The Controlled Vocabulary and Thesaurus Design course by the Library of Congress is a very relevant resource and addresses their creative and sustainability in detail. https://www.loc.gov/education/information-science/controlled-vocabularies-thesauri/ . In a hub-like we need well created and well built metadata schemes and https://www.ivoa.net/documents/2020-2021-research-management models, not only sustainable. Research data science organizations and funding need to estimate costs and budgets related to FAIR data management in a realistic way and that means to have a clear understanding of governance of the FAIR service problems, as we could see that this governance has to be FAIR. This requires evaluation of relevance and quality of FAIR services in most domains but not clear in the document also about for a strategy of this. Second also emphasize the quality of the service and the potential for sustained collaboration with the related institutions. Quality, relevant and sustainable FAIR services are https://www.ivoa.net/documents/2020-2021-research-management .		Open Science and FAIR principles are becoming more visible in Astronomy. Effort is being made to include this at the right level in the 10-year planning activities in Europe (ASTRONET Science Vision and Roadmap - https://www.astro-n.net/progression/astronetnet-science-vision-and-roadmap) and US (Scientific Review - https://www.astro-n.net/scientific-review) and astrophysics 2020-2030 (2020). On-boarded the ESP/IRIS project is a way to get sustainability and encourage them to have data FAIRisation included in their operational budget.		
	Rec. 15: provide sustainable funding	Research data science organizations and funding need to estimate costs and budgets related to FAIR data management in a realistic way and that means to have a clear understanding of governance of the FAIR service problems, as we could see that this governance has to be FAIR. This requires evaluation of relevance and quality of FAIR services in most domains but not clear in the document also about for a strategy of this. Second also emphasize the quality of the service and the potential for sustained collaboration with the related institutions. Quality, relevant and sustainable FAIR services are https://www.ivoa.net/documents/2020-2021-research-management .			Maintenance of disciplinary interoperability frameworks requires sustainable funding. We cannot afford to lose what has already been built!	
Rec. 27: Open EOSC to all providers but ensure services are FAIR	We are in the midst of a change of paradigm moving from a industry communication system controlled by a few and very powerful profile players to a new scenario where the key players are researchers themselves in a "network" and they share their data related services and an ecosystem of new, emerging and/or innovative players. Against this background, leading to services should be transparent and this should be emphasized in the document.					